

# Journal of Neurophysiology



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# Rules and Regulations

Federal Register

Vol. 54, No. 68

Tuesday, April 11, 1989

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## DEPARTMENT OF AGRICULTURE

### Farmers Home Administration

**7 CFR Parts 1807, 1924, 1942, 1944 and 1980**

#### Suspension and Debarment Proceedings

**AGENCY:** Farmers Home Administration, USDA.

**ACTION:** Final rule.

**SUMMARY:** The Farmers Home Administration (FmHA) amends its regulations by removing the Suspension and Debarment Proceedings. This action is necessary since a new Governmentwide regulation, with USDA amendments published in the *Federal Register* on January 30, 1989 (54 FR 4722) as 7 CFR Part 3017 to implement Executive Order 12549, was adopted. The intended effect of this action is to remove Part 1924, Subpart E from the CFR and update cross references in the agency's regulation.

**EFFECTIVE DATE:** April 11, 1989.

#### FOR FURTHER INFORMATION CONTACT:

David J. Howe, List Officer, Program Support Staff, Farmers Home Administration, USDA, room 6309, South Agriculture Building, 14th and Independence Avenue SW., Washington, DC 20250, Telephone (202) 382-9619.

**SUPPLEMENTARY INFORMATION:** This action has been reviewed under USDA procedures established in Departmental Regulation 1512-1, which implements Executive Order 12291, and has been determined to be exempt from those requirements because it involves only internal agency management. It is the policy of this Department to publish for comment rules relating to public property, loans, grants, benefits, or contracts, notwithstanding the exemption in 5 U.S.C. 553 with respect

to such rules. This action, however, is not published for proposed rulemaking since it involves only internal agency management, making publication for comment unnecessary.

#### Intergovernmental Consultation

This activity relates to the following programs that are listed in the Catalog of Federal Domestic Assistance and are subject to the provisions of Executive Order 12372 which requires intergovernmental consultation (7 CFR 3015, Subpart V, 48 FR 29112, June 24, 1983):

- 10.405 Farm Labor Housing Loans and Grants
- 10.409 Irrigation and Drainage Loans
- 10.411 Rural Housing Site Loans (section 523 and 524 Site Loans)
- 10.413 Recreation Facility Loans
- 10.414 Resource Conservation and Development Loans
- 10.415 Rural Rental Housing Loans
- 10.416 Soil and Water Loans (SW Loans)
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- 10.429 Guaranteed Housing
- 10.433 Housing Preservation Grants
- 10.434 Nonprofit Corporations
- 10.436 Technical Assistance and Training Grants

This activity is related to the following exempt programs which are excluded from the scope of Executive Order 12372 which requires intergovernmental consultation with State and local officials (7 CFR 3015, Subpart V, 48 FR 29115, June 24, 1983):

- 10.404 Emergency Loans
- 10.406 Farm Operating Loans
- 10.407 Farm Ownership Loans
- 10.410 Low Income Housing Loans (section 502 Rural Housing Loans)
- 10.417 Very Low-Income Housing Repair Loans and Grants (section 504 Rural Housing Loans and Grants)
- 10.421 Indian Tribes and Tribal Corporation Loans
- 10.435 Agricultural Loan Mediation Program

#### Environmental Impact Statement

This document has been reviewed in accordance with 7 CFR Part 1940,

Subpart G, Environmental Program. It is the determination of FmHA that this action does not constitute a major Federal action significantly affecting the quality of the human environment and, in accordance with the National Environmental Policy Act of 1969, Pub. L. 91-190, an Environmental Impact Statement is not required.

#### Background

Current FmHA Regulations (7 CFR Part 1924, Subpart E) provide policies and procedures and delegates the authority for suspension and debarment of persons, particularly contractors, not fulfilling their agreements with FmHA borrowers. Executive Order 12549 initiated a Governmentwide (nonprocurement) debarment and suspension regulation (and list) which was adopted with some amendments by USDA as 7 CFR Part 3017 and published as a final rule in the *Federal Register* on January 30, 1989 (54 FR 4721-4733) with the drug-free workplace portion on January 31, 1989 (54 FR 4945-4952). FmHA is implementing Part 3017 as Exhibit A of FmHA Instruction 1940-M.

#### List of Subjects in 7 CFR Parts 1807, 1924, 1942, 1944 and 1980

Loan programs—Agriculture, Loan Programs—Housing and community development, Mortgages, Agriculture, Energy conservation, Housing, Low and moderate income housing, Government contracts, Suspension and debarment procedures, Claims, Construction complaints, Construction defects, Construction and repair.

Therefore, Chapter XVIII, Title 7 of the Code of Federal Regulations is amended as follows:

#### PARTS 1807 AND 1924—[AMENDED]

1. The authority citations for Parts 1807 and 1924 continue to read as follows:

##### Part 1807

**Authority:** Secs. 307, 339, 75 Stat. 308, 318, secs. 502, 510, 63 Stat. 433, as amended, 437 sec. 4, 64 Stat. 100; 7 U.S.C. 1927, 1989, 42 U.S.C. 1472, 1480, 40 U.S.C. 442; Orders of Sec. of Agr., 19 FR 74, 26 FR 8403, 27 FR 5005, 9957.

##### Part 1924

**Authority:** 7 U.S.C. 1989; 42 U.S.C. 1480; 5 U.S.C. 301; 7 CFR 2.23 and 2.70 unless otherwise noted.

**§§ 1807.1, 1924.12 and 1924.263**

[Amended]

2. 7 CFR Chapter XVIII is amended by changing the words from "Subpart E of Part 1924 of this chapter" to read "Subpart M of Part 1940 (available in any FmHA office)" in the following places:

- (a) Part 1807, § 1807.1(e).
- (b) Part 1924, Subpart A, § 1924.12(c).
- (c) Part 1924, Subpart F, § 1924.263.

**PART 1924—CONSTRUCTION AND REPAIR**

**Subpart E—Suspension and Debarment Proceedings**

**§§ 1924.201 through 1924.220** [Removed and Reserved]

3. Subpart E of Part 1924, consisting of §§ 1924.201 through 1924.220 is removed and reserved.

**Subpart F—Complaints and Compensation for Construction Defects**

**§ 1924.256** [Amended]

4. Section 1924.256(g)(3)(ii) is amended in the last sentence by changing the reference "Subpart E of this Part" to read "Subpart M of Part 1940 (available in any FmHA office)".

5. Section 1924.256(i) is amended in the first sentence by changing the reference "FmHA Instruction 1924-E" to read "Subpart M of Part 1940 (available in any FmHA office)".

**PART 1942—ASSOCIATIONS**

6. The authority citation for Part 1942 continues to read as follows:

**Authority:** 7 U.S.C. 1989; 16 U.S.C. 1005; 5 U.S.C. 301; 7 CFR 2.23; 7 CFR 2.70, unless otherwise noted.

**Subpart A—Community Facility Loans**

**§ 1942.18** [Amended]

7. Section 1942.18(j)(8) is amended by removing the following words from the end of the last sentence: "by FmHA under Part 1924 Subpart E of this chapter".

**PART 1944—HOUSING**

8. The authority citation for Part 1944 continues to read as follows:

**Authority:** 42 U.S.C. 1480, 5 U.S.C. 301, 7 CFR 2.23, 7 CFR 2.70.

**Subpart A—Section 502 Rural Housing Loan Policies, Procedures, and Authorizations**

9. Exhibit F of Subpart A is amended by revising paragraph X(a)(8) to read as follows:

**Exhibit F—Supplemental Requirements for Making Section 502 RH Loans for Manufactured Homes**

\* \* \* \* \*

(X) \* \* \*

(a) \* \* \*

(8) Maintain a complaint file on each dealer-contractor to establish a basis for limiting future business with that dealer-contractor, if necessary. In cases of serious or continuous noncompliance, refer to Subpart M of Part 1940 (available in any FmHA office) for possible debarment action.

\* \* \* \* \*

**PART 1980—GENERAL**

10. The authority citation for Part 1980 continues to read as follows:

**Authority:** 7 U.S.C. 1989; 42 U.S.C. 1480; 5 U.S.C. 301; 7 CFR 2.23; 7 CFR 2.70.

**Subpart A—General**

**§ 1980.13** [Amended]

11. Section 1980.13(b)(5) is amended by removing "See Part 1924, Subpart E of this chapter" and adding in its place "See Subpart M of Part 1940 (available in any FmHA office)".

Dated: March 29, 1989.  
 Neal Sox Johnson,  
*(Acting) Administrator, Farmers Home Administration.*  
 [FR Doc. 89-8496 Filed 4-10-89; 8:45 am]  
 BILLING CODE 3410-07-M

**7 CFR Parts 1930 and 1944**

**Section 515 Rural Rental Housing Loan Policies, Procedure, and Authorizations**

**AGENCY:** Farmers Home Administration, USDA.

**ACTION:** Final rule.

**SUMMARY:** The Farmers Home Administration (FmHA) amends its regulations for Section 515 Rural Rental Housing Loan Policies, Procedures, and Authorizations. This action is necessary to comply with the Housing and Community Development Act of 1987. The intended effect of this action is to permit the initial operating reserve to be in the form of an irrevocable letter of credit and to permit packaging fees to be part of development cost for nonprofit applicants.

**EFFECTIVE DATE:** May 11, 1989.

**FOR FURTHER INFORMATION CONTACT:** Rebecca Johnson, Senior Loan Officer, Multi-Family Housing Processing Division, USDA, Farmers Home Administration, Room 5331, South Agriculture Building, Washington, DC 20250, telephone 202-382-1608.

**SUPPLEMENTARY INFORMATION:**

**Classification**

This final rule has been reviewed under USDA procedures established in Departmental Regulation 1512-1 which implements Executive Order 12291, and has been determined "nonmajor." It will not result in an annual effect on the economy of \$100 million or more; a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

**Regulatory Flexibility Act**

Neal Sox Johnson, Acting Administrator, Farmers Home Administration, has determined that this action will not have a significant impact on a substantial number of small entities because the revisions provide clarification of existing regulations and the annual volume of the program is expected to continue to decline. FmHA anticipates funding approximately 850 applications nationwide.

**Environmental Impact Statement**

This document has been reviewed according to 7 CFR Part 1940, Subpart G, "Environmental Program." It is the determination of FmHA that the action does not constitute a major Federal action significantly affecting the quality of the human environment and according to the National Environmental Policy Act of 1969, Pub. L. 91-190, an Environmental Impact Statement is not required.

**Intergovernmental Review**

This program/activity is listed in the Catalog of Federal Domestic Assistance under No. 10.415 and is subject to the provisions of Executive Order 12372 which requires intergovernmental consultation with State and local officials. (7 CFR Part 3015, Subpart V, 48 FR 29112, June 24, 1983.)

**Discussion of Final Rule**

A proposed rule was published in the Federal Register (53 FR 40430) on October 17, 1988. The proposed rule provided for a 60-day comment period. The comment period ended December 16, 1988. Fourteen comments were received from field offices who administer the regulation and the general public.



*A. Summary of the major comments received and actions taken follows*

*Use of the Letter of Credit*

Two respondents felt that the letter of credit concept should be abandoned because borrowers will be reluctant to draw on the letter of credit for initial operating capital. Experience has shown that borrowers would place the 2 percent requirement for initial operating capital in a 6-month CD and allow accounts to become delinquent if rent-up was not timely. Response: Legislative authority has established that the Secretary may require that the initial operation reserve be in the form of an irrevocable letter of credit. No change from proposed rule is warranted.

*B. Cash Requirement for Initial Operating Capital*

Four respondents commented that the Agency should establish a threshold for the amount of actual cash deposit when a letter of credit is to be used. Response: The Agency agrees with the concept that the initial operating capital typically be provided in both cash and a letter of credit. A modification was made to indicate, if the applicant elects to use only the letter of credit, they will need to indicate how start-up costs will be paid.

*C. Return of Initial Operating Capital at the end of 60 months*

Two comments concerned the status of any outstanding letter of credit at the end of the borrower's five full fiscal years of operation. Response: The Agency reviewed the comment and it is felt the General Operating Account portion clearly covers this issue.

*D. Definitions*

Two respondents recommended that a definition be included for Letter of Credit. Response: The Agency will include a definition for Letter of Credit in the final rule.

One respondent recommended the definition for Initial Operating Capital be expanded to include the word "delinquent" before taxes and insurance. Response: The Agency believes the current definition regarding uses of the initial operating capital account is sufficient. One respondent recommended that the letter of credit be renewed at least 30 days in advance of this expiration date, and if not, that a cash equivalent be placed in the operating account no later than 7 days prior to the expiration of the letter of credit. Response: The Agency feels the language in Exhibit B of Subpart C of Part 1930 clearly covers this issue.

*E. Eligibility Requirements*

Four respondents recommended the Letter of Credit have a two-year expiration. Another respondent recommended that the letter of credit be to the favor of Farmers Home Administration. Response: The Letter of Credit is a commercial banking instrument and can be tailored to meet the needs of FmHA procedures. A guide letter regarding the development of a letter of credit is available in each FmHA field office.

*F. Limitations on Use of Loan Funds*

The Agency has determined that the cost of obtaining a letter of credit cannot be paid out as loan proceeds.

*G. Actions Subsequent to Loan Approval*

If letter of credit is to be used, it must be presented and retained at the District Office.

*Loan Purposes*

Two respondents questioned whether or not packaging fees would be provided above or within the appraisal. Response: Packaging fees are part of development cost and FmHA can loan to public bodies and nonprofit organizations 102% of development cost or the appraised value whichever is the lesser. The criteria is governed by the authorizing legislation.

Two respondents asked for a definition of "qualified assistance." Another respondent wanted to know if the applicant entity acting as its own packager could receive a fee. Response: The Agency agrees that clarification is required and language is revised.

Two respondents recommended the Agency establish a fee rate per loan for packaging. Response: The Agency will revise the language to give guidance.

For loans obligated prior to the effective date of this regulation revision, the Letter of Credit provisions are applicable if the loan has not been closed or construction has not started, inasmuch as the percent O & M funds have not already been deposited. All other provisions are effective as otherwise herein indicated.

*List of Subjects*

*7 CFR Part 1930*

Accounting, Administrative practice and procedure, Grant Programs-Housing and community development, Loan programs-Housing and community development, Low and moderate housing-Rental, reporting requirements.

*7 CFR Part 1944*

Administrative practice and procedure, Aged, handicapped loan

programs-Housing and community development, Low and moderate income housing-Rental, Mortgages, Nonprofit organizations, Rent subsidies, and Rural housing.

Therefore, Chapter XVIII, Title 7, Code of Federal Regulations is amended as follows:

**PART 1930—GENERAL**

1. The authority citation for Part 1930 continues to read as follows:

Authority: 42 U.S.C. 1480; 7 CFR 2.23; 7 CFR 2.70.

**Subpart C—Management and Supervision of Multiple Family Housing Borrowers and Grant Recipients**

2. Exhibit B of Subpart C of Part 1930 is amended by revising the introductory text of paragraph XIII.B.2.a.(1) to read as follows:

**Exhibit B of Subpart C—Multiple Housing Management Handbook**

\* \* \* \* \*

*XIII Accounting and Reporting Requirements and Financial Management Analysis*

\* \* \* \* \*

- B. \* \* \*
- 2. \* \* \*
- a. \* \* \*

(1) *Initial Operating Capital.* The initial operating capital may be in the form of cash, an irrevocable letter of credit, or in a combination of the two as set forth in § 1944.211(a)(6) of Subpart E of Part 1944 of this chapter. The borrower will have deposited any initial operating cash into this temporary bookkeeping account by the time of the FmHA loan closing or when interim financing funds are obtained, whichever occurs first. The initial operating cash will be deposited in the General Operating Account. Any letters of credit will be supplied by the time of the FmHA loan closing or when interim financing funds are obtained, whichever occurs first. The original letter of credit will be maintained in the District Office casefile. The letter of credit must be renewed prior to its expiration date so that a current letter of credit is always in effect. If a borrower does not renew the letter of credit they will be required to deposit an equivalent amount of cash into the General Operating Account before the letter of credit expires. If a borrower supplied all or part of the initial operating capital in the form of a letter of credit and the borrower makes cash deposits into the General Operating Account for operating purposes the borrower can provide the District Office with a new letter of credit in a smaller amount with evidence of the cash deposit. The new letter of credit and the cash deposit must total the required initial operating capital. The old letter of credit will be returned to the borrower. After two, but before five full borrower fiscal years of

operation, the FmHA State Director may authorize the borrower to make a one-time withdrawal of the initial operating capital, or a part of it. The withdrawal can be in the form of cash, release or reduction in the letter of credit, or a combination of both. The total withdrawal can never exceed the initial operating capital as described in the loan agreement or loan resolution. The withdrawal can be approved provided that:

\* \* \* \* \*

3. Exhibit B-3 of Subpart C of Part 1930 is amended by revising the introductory text of paragraph V.A. to read as follows:

**Exhibit B-3 of Subpart C—Management Agreement for FmHA Multiple Family Housing Projects**

\* \* \* \* \*

*V Project Accounts*

*A. General Operating Account.* This account records all project income and disbursements. Excess project cash held in this account may be combined with other project funds described below in temporary (immediate call) interest bearing accounts when separate bookkeeping records are maintained for individual project accounts. This will usually be a checking account which must be maintained in a financial institution insured by the Federal Government. The Owner will have deposited any cash portion of the required initial operating capital into this account by the time of loan closing or when interim funds were obtained, whichever occurs first. The initial operating cash will be recorded in the General Operating Account. After two, but before five full borrower fiscal years of operation, the FmHA State Director may authorize the owner to make a one-time withdrawal of the initial operating capital, or a part of it. The withdrawal can be in the form of cash, release or reduction in the letter of credit, or combination of both. The total withdrawal can never exceed the initial operating capital as described in the loan agreement or loan resolution. The withdrawal can be approved provided that: The loan was closed on or after October 27, 1980; the loan agreement or resolution signed by the borrower is Form FmHA 1944-33 "Loan Agreement", 1944-34 "Loan Agreement", or 1944-35 "Loan Resolution"; the project has achieved at least a 95% occupancy level at the time of the withdrawal request; the withdrawal will not affect the financial integrity of the project; the owner must demonstrate that all prudent maintenance is being planned and performed and payment of necessary project expenses are not being deferred; the State Director determines that the withdrawal will not necessitate a rent increase during the year of withdrawal or during the next operation year; and the State Director has reviewed and approved any required borrower reports before the initial operating capital is withdrawn.

\* \* \* \* \*

**PART 1944—HOUSING**

4. The authority citation for Part 1944 continues to read as follows:

Authority: 42 U.S.C. 1480; 7 CFR 2.23; 7 CFR 2.70.

**Subpart E—Rural Rental Housing Loan Policies, Procedures, and Authorizations**

5. Section 1944.205 is amended by redesignating paragraphs (o) through (ee) as (q) through (gg) and by adding new paragraphs (o) and (p) to read as follows:

**§ 1944.205 Definitions.**

\* \* \* \* \*

(o) *Initial operating capital.* Cash or a pledge, in the form of an irrevocable letter of credit, to provide cash to pay for costs such as property and liability insurance premiums, fidelity bond hookup deposits, maintenance equipment, movable furnishings and equipment, printing lease forms and other initial operating expenses. The initial operating capital will be at least 2 percent of the total development cost of the project.

(p) *Irrevocable Letter of Credit.* Is a commercial banking instrument used as an unencumbered and standby liquid asset in lieu of cash.

\* \* \* \* \*

6. Section 1944.211 is amended by revising paragraph (a)(6) to read as follows:

**§ 1944.211 Eligibility requirements.**

(a) \* \* \*

(6) Have or be able to obtain the initial operating capital and other assets needed for a sound loan. RRH loans made to nonprofit organizations and to State or local public agencies may include up to 2 percent of the development cost for initial operating expenses.

(i) If initial operating expenses are expected to be greater than 2 percent of the development cost, the initial operating capital will be increased accordingly.

(ii) Initial operating capital can be provided both in cash and in the form of an irrevocable letter of credit or a combination of both. If all operating capital is to be provided by a letter of credit, the applicant must indicate how start-up costs will be paid. It is expected, however, that most applicants will select a combination of cash and a letter of credit.

(A) Funds provided in cash will be deposited into the general operating account in accordance with the provisions of the loan agreement or loan

resolution prior to the start of construction or loan closing (whichever is first) and will be used for authorized purposes only.

(B) If provided as an irrevocable letter of credit it must:

(1) Be unconditional;

(2) Be from a Federally Insured Financial Entity and show the Issuing Bank's name, document control number, issuance and expiration date;

(3) Be addressed to the project owner/entity and specifically refer to the proposed project;

(4) Be for a term of at least one year, contain an automatic renewal clause, and require a minimum of 30 days notice of expiration if the issuing bank elects not to renew the Letter of Credit;

(5) Be free of any deposit and/or reserve restrictions and may not be secured by the FmHA financed project;

(6) Be provided prior to the start of construction or when interim financing of funds are obtained or loan closing (whichever occurs first);

(7) Contain the statement "This Letter of Credit is issued to *Name of Entity* in the interest of the *Name of Project, Location—Street, City, State*, for satisfaction of Initial Operating Capital required in a loan agreement with the Farmers Home Administration."

(C) If provided as a combination:

(1) The cash and letter of credit, added together, must equal the required initial operating capital;

(2) They must be provided prior to the start of construction or loan closing (whichever is first);

(3) The cash portion will be handled according to paragraph (a)(6)(ii)(A) of this section and the letter of credit must meet all requirements of paragraph (a)(6)(ii)(B) of this section.

(iii) When the applicant is to provide other movable equipment and furnishings, the initial capital will be increased sufficiently to cover the cost of these items.

(iv) If the borrower provided the initial 2-percent operating capital from its own funds, the State Director may authorize the borrower to make a one-time withdrawal from project funds after two, but before five 5 full borrower fiscal years of operation, in accordance with Subpart C of Part 1930 of this chapter.

\* \* \* \* \*

7. Section 1944.212 is amended by revising paragraph (j) to read as follows:

**§ 1944.212 Loan purposes.**

\* \* \* \* \*

(j) Provide loan funds to enable a nonprofit group or public body to pay fees, for technical assistance received

from a nonprofit organization, with housing and/or community development experience, to assist it in the formation or incorporation and development and packaging of its loan docket and project, as well as any legal, technical, and professional fees incurred in the formation or incorporation of the applicant entity.

(1) Fees can also be provided to pay the nonprofit applicant entity for packaging of its loan docket and project, but not to include the formation and incorporation of the entity.

(2) The amount to be paid for packaging of the loan docket and project should not exceed 1% of the FmHA loan or whatever is reasonable and typical for the area.

(3) Related project costs as listed in § 1944.222 of this subpart are not included as a part of the fee for packaging of the loan docket and project.

\* \* \* \* \*  
8. Section 1944.213 is amended by adding paragraph (b)(12) to read as follows:

**§ 1944.213 Limitations.**

\* \* \* \* \*  
(b) \* \* \*  
(12) Payment of fees charged by a commercial banking institution for granting a letter of credit.

\* \* \* \* \*  
9. Section 1944.235 is amended by revising paragraph (a)(3) to read as follows:

**§ 1944.235 Actions subsequent to loan approval.**

(a) \* \* \*  
(3) Unless initial operating capital is included in the loan, the applicant will furnish evidence that the initial operating capital is in place. If cash is being used, evidence of a deposit to the general operating account will be provided. If an irrevocable letter of credit is being used, the original Letter of Credit must be presented and maintained in the District Office with the casefile.

**§ 1944.237 [Amended]**

10. In § 1944.237, paragraph (c)(2) is amended by adding the following sentence at the end of the paragraph: "The 2 percent O and M amount can be in the form of cash or an irrevocable letter of credit as described in § 1944.211 (a)(6) of this subpart."

**Exhibit A-6 of Subpart E [Amended]**

11. In Exhibit A-6 of Subpart E, the introductory text of paragraph I.A. is amended by adding the following

sentence at the end of the paragraph: "The initial operating capital requirement may be fulfilled by contributing cash or by providing an irrevocable letter of credit."

Dated March 16, 1989.  
Neal Sox Johnson,  
*Acting Administrator, Farmers Home Administration.*  
[FR Doc. 89-8495 Filed 4-10-89; 8:45 am]  
BILLING CODE 3410-07-M

**FEDERAL TRADE COMMISSION**

**16 CFR Part 13**

[Dkt. 9189]

**Detroit Auto Dealers Association, Inc., et al.; Prohibited Trade Practices and Affirmative Correct Actions**

**AGENCY:** Federal Trade Commission.  
**ACTION:** Final order.

**SUMMARY:** This final order requires, among other things, the Detroit, Mich.-area automobile dealerships to remain open a minimum of 64 hours a week for one year and to post conspicuously their hours of operation. The order prohibits all of the respondents from conspiring in any way to fix hours of operation, and requires the associations to amend their bylaws, rules, and regulations to eliminate any provision inconsistent with any provision of this order.

**DATES:** Complaint issued December 20, 1984. Final order issued February 22, 1989.<sup>1</sup>

**FOR FURTHER INFORMATION CONTACT:** Dennis Johnson, FTC/S-2105, Washington, DC 20580. (202) 326-2712.

**SUPPLEMENTARY INFORMATION:** In the Matter of Detroit Auto Dealers Association, Inc., et al. The prohibited trade practices and/or corrective actions, as codified under 16 CFR Part 13, are as follows: Subpart—Coercing And Intimidating: § 13.345 Competitors; § 13.367 Members. Subpart—Combining Or Conspiring; § 13.384 Combining Or Conspiring; § 13.388 To control allocation and solicitation of customers; § 13.395 To control marketing practices and conditions; § 13.475 To restrict competition in buying. Subpart—Corrective Actions And/Or Requirements; § 13.533 Corrective actions and/or requirements; § 13.533-20 Disclosures; § 13.533-45 Maintain records; § 13.533-45(k) Records, in general; § 13.533-50 Maintain means of

<sup>1</sup> Copies of the Complaint, Initial Decision, and Opinion of the Commission are available from the Commission's Public Reference Branch, 11-130, 6th and Pa. Ave., NW, Washington, DC 20560.

communication; § 13.533-60 Release of general, specific, or contractual constrictions requirements, or restraints. Subpart—Cutting Off Access To Customers Or Market; § 13.560 Interfering with distributive outlets. Subpart—Cutting Off Supplies Or Service; § 13.610 Cutting off supplies or service; § 13.625 Organizing and controlling supply sources.

**List of Subjects in 16 CFR Part 13**

Auto dealers, Motor vehicles, Trade practices.

(Sec. 6, 38 Stat. 721; 15 U.S.C. 46. Interprets or applies sec. 5, 38 Stat. 719, as amended; 15 U.S.C. 45)

Commissioners: Daniel Oliver, Chairman, Terry Calvani, Mary L. Azcuenaga, Andrew J. Strenio, Jr., Margot E. Machol.

**Final Order**

This matter has been heard by the Commission upon the appeal of complaint counsel from the initial decision and upon briefs and oral argument in support of and in opposition to the appeal. For the reasons stated in the accompanying opinion, the Commission has determined to reverse the initial decision and enter the following order. Accordingly,

*It is ordered,* That for purposes of this Order, the following definitions shall apply:

1. "Person" means any natural person, corporation, partnership, association, joint venture, trust, or other organization or entity, but not governmental entities.

2. "Dealer" means any person who receives on consignment or purchases motor vehicles for sale or lease to the public, and any director, officer, employee, representative or agent of any such person.

3. "Dealer association" means any trade, civic, service, or social association whose membership is composed primarily of dealers.

4. "Detroit area" means the Detroit, Michigan metropolitan area, comprising Macomb County, Wayne County and Oakland County in the State of Michigan.

5. "Hours of operation" means the times during which a dealer is open for business to sell or lease motor vehicles.

6. "Weekday hours" means the hours of 9:00 a.m. to 6:00 p.m. Monday through Friday.

7. "Non-weekday hours" means hours other than 9:00 a.m. to 6:00 p.m. Monday through Friday.

8. "Dealership and Individual Respondent" means any corporation listed in Addendum A to the order, including its officers, directors, representatives, agents, divisions,

subsidiaries and successors and assigns, and any individual listed in Addendum B to the order.

9. "Association Respondent" means any association listed in Addendum C to the order, the officers, directors, representatives, agents, divisions, subsidiaries, successors and assigns of any listed association, and James Daniel Hayes.

10. "Respondent" means any dealership, individual, or association respondent.

I.

*It is further ordered.* That each respondent shall cease and desist from, directly or indirectly or through any corporate or other device, entering into, continuing, or carrying out any agreement, contract, combination, or conspiracy, in or affecting commerce (as "commerce" is defined in the Federal Trade Commission Act), with any other respondent or other dealer or dealer association in the Detroit area to establish, fix, maintain, adopt, or adhere to any hours of operation.

II.

*It is further ordered.* That each respondent shall cease and desist from, directly or indirectly or through any corporate or other device, performing any of the following acts or practices or encouraging, inducing, or requiring any person to perform any of the following acts or practices, or entering into, continuing, or carrying out any agreement, contract, combination, or conspiracy with any other person in the Detroit area to do or perform any of the following acts or practices:

A. Exchanging information or communicating with any other respondent or other dealer or dealer association in the Detroit area concerning hours of operation, except to the extent necessary to comply with any order of the Federal Trade Commission, and except, after two (2) years from the date this order becomes final, to the extent necessary to incorporate individual dealers' hours of operation in lawful joint advertisements; or

B. Requesting, recommending, coercing, influencing, inducing, encouraging, or persuading, or attempting to request, recommend, coerce, influence, induce, encourage, or persuade, any other respondent or other dealer or dealer association in the Detroit area to maintain, adopt or adhere to any hours of operation.

III.

*It is further ordered.* That each dealership and individual respondent shall, commencing thirty (30) days after

this order becomes final and continuing for a period of one (1) year, maintain a minimum of sixty-four (64) hours of operation per week for the sale and lease of motor vehicles. Each dealership and individual respondent shall post conspicuously its hours of operation at each of its places of business subject to this order in a manner and location readily visible to the public from outside the dealership's showroom. Each dealership and individual respondent shall conduct its sales operation during any non-weekday hours in all respects in the same manner as during weekday hours, except that the motor vehicle sales force on duty during non-weekday hours may equal in number no less than one-third of the motor vehicle sales force generally on duty during weekday hours.

The requirement of this Part III to maintain minimum weekly hours of operation shall not apply to any individual respondent who does not own or operate any dealership in the Detroit area.

IV.

*It is further ordered.* That respondent Detroit Auto Dealers Association, Inc. ("DADA") shall:

A. Beginning thirty (30) days after this order becomes final, and for a period of not less than four (4) weeks thereafter, place and cause to be disseminated each week at least four (4) advertisements, including one in the Thursday edition and one in the Saturday edition of the *Detroit News* and one in the Thursday edition and one in the Saturday edition of the *Detroit Free Press*. The advertisements shall be devoted exclusively to explaining that dealership and individual respondents are required to offer expanded shopping hours for one year as a result of this order and will be free to continue offering expanded hours thereafter. The advertisements shall be a minimum of one-eighth (1/8) of a page and shall be placed in the same location at which advertisements for the sale of new automobiles ordinarily appear; and

B. Before placing the first such advertisement, DADA shall conduct, or cause to be conducted, copy testing of the advertisement. The copy testing shall be conducted by a reputable advertising or research organization using techniques commonly accepted in the advertising profession. The advertising or research organization shall provide a written report to DADA explaining the results of the copy testing. DADA may use the copy-tested advertisement to satisfy its obligations under this Part IV only if the report establishes that the advertisement

effectively communicates: (1) That until [date of Order], most Detroit-area automobile dealers have not been open for business on Saturday or on Tuesday, Wednesday, or Friday evening; and (2) that as the result of litigation with the Federal Trade Commission, Detroit-area automobile dealers must offer expanded shopping hours for one year, and are free to choose their own hours thereafter. In the event any subsequent advertisement prepared pursuant to this paragraph differs significantly from the first advertisement disseminated in accordance with this paragraph, DADA shall conduct or cause to be conducted copy testing of the subsequent advertisement in the same manner and for the same purpose as described above.

V.

*It is further ordered.* That each dealership and individual respondent shall, while Part III of this order is in effect, disclose its hours of operation in all of its advertising, except that such disclosure is not required in advertisements offering for sale a single, particular motor vehicle. In any print advertisements, the disclosure shall be displayed in a type size at least as large as that in which the principal portion of the text of the advertisement appears, and the disclosure shall be highlighted so that it can be readily noticed. In television advertisements, the disclosure shall be presented in both the audio and visual portions. During the audio portion of the disclosure in television and radio advertisements, no other sounds, including music, shall occur and the rate of speech shall be the same as for the other parts of the advertisement.

VI.

*It is further ordered.* That each association respondent shall, for a period of five (5) years from the date this order becomes final, cause to be made a notarized stenographic transcription of all business meetings of its membership, board of directors, or committees, and shall retain such transcript for a period of five (5) years from the date of the transcription. Such transcripts shall be provided to the Commission upon request.

VII.

*It is further ordered.* That each association respondent shall:

A. Within sixty (60) days from the date this order becomes final, amend its bylaws, rules and regulations to eliminate any provision inconsistent with any provision of this order;

B. Within sixty (60) days from the date this order becomes final, amend its bylaws, rules and regulations to incorporate: (1) a provision that prohibits its members from discussing at any formal or informal membership, board of directors, or committee meeting the hours of operation of any dealer, except to the extent necessary to comply with any order of the Federal Trade Commission; and (2) a provision that requires expulsion from membership of any member who violates such prohibition;

C. Within ten (10) days after the amendment of any bylaws, rules or regulations pursuant to this order, furnish a copy of such amended bylaws, rules or regulations to all members, and within ten (10) days of any new member joining association respondent, furnish to such new member a copy of the bylaws, rules and regulations of association respondent; and

D. Within thirty (30) days after receiving information from any source concerning a potential violation of any bylaw, rule, or regulation required by Part VII.B of this order, investigate the potential violation, record the findings of the investigation, and expel for a period of one (1) year any member who is found to have violated any of the bylaws, rules or regulations required by Part VII.B of this order.

#### VIII

*It is further ordered,* That each association respondent shall, for a period of five (5) years from the date this order becomes final, provide to the Commission the name and address of any member expelled pursuant to the requirements of Part VII.D of this order within ten (10) days after such expulsion.

#### IX

*It is further ordered,* That within ten (10) days after the date this order becomes final, each dealership and individual respondent shall provide a copy of the order to each of its employees and each association respondent shall provide a copy of the order to each of its officers, directors, members and employees. For a period of five (5) years from the date this order becomes final, each dealership and individual respondent shall provide a copy of the order to each new employee involved in motor vehicle sales or leasing, and each association respondent shall provide a copy to each new member, within ten (10) days after the date the employee is hired or the new member joins the association respondent.

#### X

*It is further ordered,* That each respondent shall, within ninety (90) days after this order becomes final and annually thereafter for a period of five (5) years, file with the Commission a written report setting forth in detail the manner and form in which it has complied with this order.

#### XI

*It is further ordered,* That for a period of five (5) years from the date this order becomes final, each dealership respondent and association respondent shall notify the Commission at least thirty (30) days prior to any proposed change in corporate status (such as dissolution, assignment, or sale) that results in the emergence of a successor corporation, the creation or dissolution of subsidiaries, or any other change in any corporate respondent which may affect compliance obligations arising out of the order. Each individual respondent shall, for five (5) years from the date the order becomes final, promptly notify the Commission of the discontinuance of his present business or employment and of any new affiliation or employment with any dealer or dealer association. Such notice shall include the individual respondent's new business address and a statement of the nature of the business or employment in which the respondent is newly engaged, as well as a description of the respondent's duties and responsibilities in connection with the new business or employment.

By the Commission, Commissioner Machol not participating.

Donald S. Clark,  
Secretary

#### Addendum A—Dealership Respondents

Barnett Pontiac-Datsun, Inc.  
Jim Causley Pontiac-GMC Truck, Inc.  
Jim Fresard Pontiac, Inc.  
Red Holman Pontiac-Toyota-GMC Truck Co.  
Art Moran Pontiac-GMC, Inc.  
Packer Pontiac Co., a Division of the Packer Corp.  
Rinke Pontiac-GMC Co.  
Bob Sellers Pontiac-GMC, Inc.  
Shelton Pontiac-Buick, Inc.  
Porterfield Wilson Pontiac-GMC Truck, Inc.  
Woody Pontiac Sales, Inc.  
Jack Cauley Chevrolet, Inc.  
Dexter Chevrolet Co.  
Dick Genthe Chevrolet, Inc.  
James-Martin Chevrolet, Inc.  
Jefferson Chevrolet Co.  
Lou LaRiche Chevrolet-Subaru, Inc.  
Walt Lazar Chevrolet, Inc.  
Mark Chevrolet, Inc.  
George Matick Chevrolet, Inc.

Matthews-Hargreaves Chevrolet Co  
Merollis Chevrolet Sales & Service  
Ed Rinke Chevrolet-GMC Co.  
Mike Savoie Chevrolet, Inc.  
Les Stanford Chevrolet, Inc.  
Steward Chevrolet, Inc.  
Tennyson Chevrolet, Inc.  
Buff Whelan Chevrolet, Inc.  
Wink Chevrolet Co. d/b/a Bill Wink Chevrolet/GMC  
Greenfield AMC/Jeep-Renault, Inc.  
Village AMC/Jeep, Inc.  
Armstrong Buick-Opel, Inc.  
Jim Carney Buick Co.  
Fischer Buick-Subaru, Inc.  
Bill Greig Buick-Opel, Inc.  
Krajenke Buick Sales, Inc.  
Tamaroff Buick-Honda, Inc.  
Audette Cadillac, Inc.  
Crissman Cadillac, Inc.  
Charles Dalgleish Cadillac-Peugeot, Inc.  
Dreisbach & Sons Cadillac Co.  
Roger Rinke Cadillac Co.  
Birmingham Chrysler-Plymouth, Inc.  
Lochmoor Chrysler Plymouth, Inc.  
Shelby Oil Company, Inc.  
Roseville Chrysler-Plymouth, Inc.  
Bill Snethkamp, Inc.  
Thompson Chrysler-Plymouth, Inc.  
Westborn Chrysler-Plymouth, Inc.  
Colonial Dodge, Inc.  
Crestwood Dodge, Inc.  
Garrity Motor Sales, Inc.  
Mt. Clemens Dodge, Inc.  
Northwestern Dodge, Inc.  
Oakland Dodge, Inc.  
Sterling Heights Dodge, Inc.  
Van Dyke Dodge, Inc.  
Avis Ford, Inc.  
Jerry Bielfield Co.  
Beverly John Ford  
Jack Demmer Ford, Inc.  
Gorno Brothers, Inc.  
Jerome-Duncan, Inc.  
Al Long Ford, Inc.  
McDonald Ford Sales, Inc.  
Pat Milliken Ford, Inc.  
Russ Milne Ford, Inc.  
North Brothers Ford, Inc.  
Ed Schmid Ford, Inc.  
Stark Hickey West, Inc.  
Bob Thibodeau, Inc.  
Ray Whitfield Ford  
Arnold Lincoln-Mercury Co.  
Avon Lincoln-Mercury, Inc.  
Bob Borst Lincoln-Mercury, Inc.  
Crest Lincoln-Mercury Sales, Inc.  
Bob Dusseau, Inc.  
Stu Evans Lincoln-Mercury, Inc., of Garden City  
Stu Evans Lincoln-Mercury, Inc., of Southgate  
Hines Park Lincoln-Mercury, Inc.  
Krug Lincoln-Mercury, Inc.  
McInerney, Inc.  
Bob Maxey Lincoln-Mercury Sales, Inc.  
PHP d/b/a Park Motor Sales Co.  
Star Lincoln-Mercury, Inc.

Charnock Oldsmobile, Inc.  
 Drummy Oldsmobile, Inc.  
 Gage Oldsmobile, Inc.  
 Bill Rowan Oldsmobile, Inc.  
 Suburban Oldsmobile-Datsun, Inc.  
 Autobahn Motors, Inc.  
 McAlister Motors, Inc.  
 Melton Motors, Inc.  
 Sterling Motors, Inc.  
 Wood Motors, Inc.  
 Pointe Dodge, Inc.

#### Addendum B—Individual Respondents

W. Robert Allen  
 Thomas Armstrong  
 Charles Audette  
 Frank Audette  
 Robert F. Barnett  
 Jerry M. Bielfield  
 Robert C. Borst  
 Robert M. Brent  
 Paul Carrick  
 John H. Cauley  
 James F. Causley, Sr.  
 J. Herbert Charnock  
 John Cueter  
 Charles Dalglish, Jr.  
 Douglas Dalglish  
 John E. Demmer  
 Harry C. Demorest  
 Al Dittrich  
 Thomas S. Dreisbach  
 John L. Drummy, Sr.  
 Richard J. Duncan  
 Robert Dusseau  
 Stewart Evans  
 Arnold Feuerman  
 Richard Flannery  
 John Ford  
 F. James Fresard  
 Frank Galeana  
 James A. Garrity  
 Richard E. Genthe  
 James Daniel Hayes  
 William Hickey  
 Albert A. Holman  
 Naiff H. Kelel  
 George Kolb  
 Sigmund Krug  
 Louis H. LaRiche  
 James P. Large  
 Walter N. Lazar  
 W. Desmond McAlister  
 Martin J. McInerney  
 George S. Matick, Jr.  
 Robert Maxey  
 Kenneth Meade  
 George Melton  
 Norman A. Merollis  
 Zigmund F. Mielmicki  
 W.B. (Pat) Milliken  
 Russell H. Milne  
 Arthur C. Moran  
 James E. North  
 James Riehl  
 Roger J. Rinke  
 Roland Rinke  
 William Ritchie  
 Arthur J. Roshak

William H. Rowan  
 Myron P. Savoie  
 Edward F. Schmid  
 Robert B. Sellers  
 C.M. (Bud) Shelton  
 Joseph B. Slatkin  
 William Snethkamp  
 Leslie J. Stanford  
 Gordon L. Stewart  
 Marvin Tamaroff  
 James P. Tellier  
 Harry Tennyson  
 Raymond R. Tessmer  
 Robert Thibodeau  
 Joseph P. Thompson  
 Anthony J. Viviano  
 Raymond J. Whitfield  
 Stanley A. Wilk  
 Porterfield Wilson  
 William J. Wink, Jr.  
 Donald Wood  
 Woodrow W. Woody  
 Robert Zankl

#### Addendum C—Association Respondents

Detroit Auto Dealers Association, Inc.  
 Tri County Pontiac Dealers Association, Inc.  
 Greater Detroit Chevrolet Dealers Association, Inc.  
 Chrysler and Plymouth Dealers Association of Greater Detroit, Inc.  
 Greater Detroit Dodge Dealers Association, Inc.  
 Metro Detroit AMC Dealers Association, Inc.  
 Metro Detroit Buick Dealers Association, Inc.  
 Metro Detroit Cadillac Dealers Association, Inc.  
 Metropolitan Detroit Ford Dealers, Inc.  
 Metropolitan Detroit Oldsmobile Dealers Association, Inc.  
 Metropolitan Lincoln-Mercury Dealers Association, Inc.  
 Southeastern Michigan Volkswagen Dealers Association, Inc.  
 Metropolitan Detroit Chevrolet Dealers Advertising Association, Inc.  
 Chrysler-Plymouth Dealers of Greater Detroit Advertising Association, Inc.  
 Metro Detroit AMC Advertising Association, Inc.  
 Ford Dealers Advertising Fund, Inc.  
 Lincoln-Mercury Dealers Advertising Fund—Detroit District, Inc.  
 Tri County D.A.A., Inc.

[FR Doc. 89-8523 Filed 4-10-89; 8:45 am]

BILLING CODE 4750-01-M

## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### Food and Drug Administration

#### 21 CFR Part 520

#### Oral Dosage Form New Animal Drugs Not Subject To Certification; Sulfamethazine Sustained-Release Boluses

**AGENCY:** Food and Drug Administration.

**ACTION:** Final rule.

**SUMMARY:** Food and Drug Administration (FDA) is amending the animal drug regulations to reflect approval of a supplemental new animal drug application (NADA) filed by Fermenta Animal Health Co. The application provides for the use of sustained-release boluses containing 8.25 grams of sulfamethazine for the treatment of certain disease conditions in ruminating beef and dairy calves.

**EFFECTIVE DATE:** April 11, 1989.

**FOR FURTHER INFORMATION CONTACT:** Charles E. Haines, Center for Veterinary Medicine (HFV-133), Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857, 301-443-3410.

**SUPPLEMENTARY INFORMATION:** Fermenta Animal Health Co., 7410 NW Tiffany Springs Parkway, P.O. Box 901350, Kansas City, MO 64190-1350, has filed supplemental NADA 140-270 which provides for the use of an 8.25-gram sulfamethazine sustained-release calf bolus. The drug is indicated for use in ruminating beef and dairy calves for treating bacterial pneumonia, colibacillosis, coccidiosis, and calf diphtheria caused by organisms susceptible to sulfamethazine. The firm currently holds approval for the use of a 30-gram sulfamethazine sustained-release bolus in beef cattle and nonlactating dairy cattle for treating the same disease conditions. The supplemental NADA is approved and 21 CFR 520.2260b is amended to reflect the approval. The basis for approval is discussed in the freedom of information summary.

In accordance with the freedom of information provisions of Part 20 (21 CFR Part 20) and § 514.11(e)(2)(ii) (21 CFR 514.11(e)(2)(ii)), a summary of safety and effectiveness data and information submitted to support approval of this application may be seen in the Dockets Management Branch (HFA-305), Food and Drug Administration, Rm. 4-62, 5600 Fishers Lane, Rockville, MD 20857, from 9 a.m. to 4 p.m., Monday through Friday

The agency has determined under 21 CFR 25.24(d)(1)(i) that this action is of a type that does not individually or cumulatively have a significant effect on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required.

#### List of Subjects in 21 CFR Part 520

Animal drugs.

Therefore, under the Federal Food, Drug, and Cosmetic Act and under authority delegated to the Commissioner of Food and Drugs and redelegated to the Center for Veterinary Medicine, Part 520 is amended as follows:

#### PART 520—ORAL DOSAGE FORM NEW ANIMAL DRUGS NOT SUBJECT TO CERTIFICATION

1. The authority citation for 21 CFR Part 520 continues to read as follows:

Authority: Sec. 512(i), 82 Stat. 347 (21 U.S.C 360b(i)); 21 CFR 5.10 and 5.83.

2. Section 520.2260b is amended by adding new paragraph (h) to read as follows:

#### § 520.2260b Sulfamethazine sustained-release boluses.

\* \* \* \* \*

(h)(1) *Sponsor*. See No. 054273 in § 510.600(c) of this chapter for use of an 8.25-gram sulfamethazine sustained-release bolus.

(2) *Conditions of use*—(i) *Amount*. Administer at the rate of 1 bolus (8.25 grams per bolus) per 50 pounds of body weight, as a single dose. If signs of disease are significantly reduced, it is recommended that a second dose be given to provide an additional 72 hours of therapy.

(ii) *Indications for use*. Administer orally to ruminating beef and dairy calves for treatment of the following diseases when caused by one or more of the listed pathogenic organisms susceptible to sulfamethazine: bacterial pneumonia associated with *Pasteurella* spp., colibacillosis (bacterial scours) caused by *Escherichia coli*; coccidiosis caused by *Eimeria bovis* and *E. zurnii*; and calf diphtheria caused by *Fusobacterium necrophorum*.

(iii) *Limitations*. Do not use in calves to be slaughtered under 1 month of age or calves being fed an all milk diet. Do not use in female dairy cattle 20 months of age or older. If symptoms persist after 3 days, consult a veterinarian. Do not administer more than 2 consecutive doses. Do not slaughter animals for food for at least 8 days after the last dose. Do not crush bolus.

Dated: March 31, 1989.

Robert C. Livingston,  
Office of New Animal Drug Evaluation Center  
for Veterinary Medicine.

[FR Doc. 89-8477 Filed 4-10-89; 8:45 am]

BILLING CODE 4160-01-M

## DEPARTMENT OF THE TREASURY

### Internal Revenue Service

#### 26 CFR Part 35a

[T.D. 8248]

#### Imposition of Backup Withholding Due to Notification of an Incorrect Taxpayer Identification Number and the Due Diligence Exception to the Imposition of a Penalty for a Missing or an Incorrect Taxpayer Identification Number

**AGENCY:** Internal Revenue Service, Treasury.

**ACTION:** Temporary regulations.

**SUMMARY:** This document contains temporary regulations that would clarify the rules concerning the requirement for payors to backup withhold due to notification of an incorrect taxpayer identification number and the actions that payors must take to exercise due diligence with respect to a missing or an incorrect taxpayer identification number. These regulations also amend those rules in order to conform them to the changes announced in Notice 88-77, 1988-28 I.R.B. 26, and Notice 88-89, 1988-34 I.R.B. 22.

Further, the regulations provide new due diligence standards for payors of certain accounts with post-1987 awaiting-TIN certifications, for payors of certain life-insurance beneficiaries, and for payors of certain payees who are exempt from the payment of the tax on self-employment income under Code section 1401 or the Federal Insurance Contributions Act tax on employers or employees under Code sections 3111 or 3101, respectively. These regulations affect payors, brokers, and payees of certain reportable payments and provide them with the guidance necessary to comply with the law.

The text of the temporary regulations set forth in this document also serves as the text of the proposed regulations cross-referenced in the notice of proposed rulemaking in the Proposed Rules section of this issue of the *Federal Register*.

**EFFECTIVE DATE:** These regulations are effective for reportable payments made after December 31, 1983, and to information returns filed after December 31, 1984. However, the requirements of

§ 35a.3406-1 are effective on and after January 1, 1989. Thus, a payor is only required to notify payees and backup withhold on payee accounts as required by these regulations if the payor receives a notice of an incorrect taxpayer identification number from the Internal Revenue Service on or after January 1, 1989.

**FOR FURTHER INFORMATION CONTACT:** Renay France, (202-566-3627, not a toll-free number).

#### SUPPLEMENTARY INFORMATION:

##### Background

This document contains temporary regulations relating to the requirement that a payor or broker backup withhold 20 percent from any reportable payment under section 3406(a)(1)(B) of the Internal Revenue Code of 1986. This provision was added to the Code by section 104 of the Interest and Dividend Tax Compliance Act of 1983 (Pub. L. 98-67, 97 Stat. 369, 371). This document also contains temporary regulations relating to due diligence requirements under section 6676(b) of the Code as amended by section 105 of the Act (Pub. L. 98-67, 97 Stat. 369, 380).

On October 4, 1983, the *Federal Register* published Temporary Employment Tax Regulations under the Interest and Dividend Tax Compliance Act of 1983 (26 CFR Part 35a) under sections 3406 and 6676(b) of the Internal Revenue Code of 1954 (26 CFR Part 35a.9999-1; T.D. 7916, 48 FR 45362, as amended on November 25, 1983, by T.D. 7922, 48 FR 53111, and on November 23, 1987, by T.D. 8163, 52 FR 44861). Additional temporary regulations were published in the *Federal Register* on November 25, 1983 (26 CFR Part 35a.9999-2; T.D. 7922, 48 FR 53106, as amended on December 20, 1983, by T.D. 7929, 48 FR 56342, on March 13, 1984, by T.D. 7922, 49 FR 9417, and on November 23, 1987, by T.D. 8163, 52 FR 44861), on December 20, 1983 (26 CFR 35a.9999-3; T.D. 7929, 48 FR 56330, as amended on January 3, 1984, by T.D. 7933, 49 FR 63, on August 22, 1984, by T.D. 7966, 49 FR 33236, and on November 23, 1987, by T.D. 8163, 52 FR 44861), on February 28, 1984 (26 CFR 35a.9999-3A, T.D. 7946, 49 FR 7227), on August 22, 1984 (26 CFR Part 35a.9999-4T, T.D. 7966, 49 FR 33237 as amended on August 29, 1984, by T.D. 7972, 49 FR 34340; and 26 CFR Part 35a.9999-5; T.D. 7967, 49 FR 33240, as amended on September 19, 1984, by T.D. 7973, 49 FR 36645, on August 20, 1985, by T.D. 8046, 50 FR 33526, on April 3, 1986, by T.D. 8046, 51 FR 11447, on December 19, 1986, by T.D. 8110, 51 FR 45453, and on May 19, 1988, by T.D. 8202, 53 FR

17927), on April 23, 1987 (26 CFR 35a.3406-2; T.D. 8137, 51 FR 13430), and on November 23, 1987 (26 CFR 35a.3406-1; T.D. 8163, 52 FR 44861). Those regulations were published primarily to provide guidance under the Interest and Dividend Tax Compliance Act of 1983.

This document contains temporary regulations that would clarify the rules in § 35a.3406-1 and §§ 35a.9999-1 and 35a.9999-3 concerning the requirement to backup withhold due to an incorrect taxpayer identification number under section 3406(a)(1)(B) and the actions that payors must take to exercise due diligence under section 6676(b) as published in the *Federal Register* on November 23, 1987 (§§ 35a.9999-1 and -3; T.D. 8163, 52 FR 44861). Also, this document would amend those rules in order to conform them to the changes announced in Notice 88-77, 1988-28 I.R.B. 26, and Notice 88-89, 1988-34 I.R.B. 22. Further, this document revises Q/A-10 in § 35a.9999-1 (concerning substitute Forms W-9) which was published in the *Federal Register* on October 4, 1983 (26 CFR Part 35a.9999-1; T.D. 7916, 48 FR 45362) and adds new questions and answers to § 35a.9999-3 on actions that payors may take to exercise due diligence. The temporary regulations in this document will remain in effect until superseded by final regulations on this subject. See the Proposed Rules section of this issue of the *Federal Register* under which persons may provide written comments to the Internal Revenue Service on the regulations contained in this document.

These temporary regulations are necessary to provide immediate guidance to payors, brokers, and payees when there is notification of an incorrect taxpayer identification number. The Internal Revenue Service intends to publish a notice of proposed rulemaking in the *Federal Register* in the near future that will provide comprehensive rules regarding backup withholding. Generally, the pertinent provisions of all the temporary regulations with respect to backup withholding will be incorporated in the notice of proposed rulemaking. The notice of proposed rulemaking will provide the public an opportunity to comment on all the regulations sections issued under 3406 and 6676(b). However, the notice and any hearing that might be scheduled will not cover any of the rules set forth in INTL-52-86. See 53 FR 5991 and 54 FR 11236.

#### Explanation of Provisions

On November 23, 1987, the Service published Treasury Decision 8163, temporary regulations under sections 3406(a)(1)(B), requiring payors to backup

withhold on accounts of payees when notified by the Service that such payees provided an incorrect taxpayer identification number. That Treasury decision also contains temporary regulations under section 6676(b) on the actions that payors must take to exercise due diligence and thereby avoid the \$50 penalty for filing an information return of reportable interest or dividends with a missing or an incorrect taxpayer identification number. Payors expressed concern with some of these rules and in particular with their administrability. As a result of this concern the Service issued two notices in 1988 to clarify those areas where confusion existed and to ease the administrability of the rules. See Notice 88-77, 1988-28 I.R.B. 26 and Notice 88-89, 1988-34 I.R.B. 22. This document conforms the rules in the Treasury decision to those set forth in the notices. In addition this document contains other clarifying rules to the Treasury decision plus several new substantive rules for the actions that payors must take to exercise due diligence. These new clarifying and substantive rules are as follows.

#### *Backup Withholding Due To Notification Of An Incorrect Taxpayer Identification Number*

In response to comments this document makes several minor changes to the notice set forth in the Treasury decision described in § 35a.3406-1(c) that payors must send to their payees informing them that their accounts contain an incorrect taxpayer identification number and the actions that payees must take to prevent backup withholding from commencing or to stop it once it has begun.

For example, upon being notified that a payee provided an incorrect taxpayer identification number which is currently used on an account, a payor is required to send a Form W-9 (or an acceptable substitute form) so that the payee can furnish a taxpayer identification number or name (or both) to the payor (or furnish the existing taxpayer identification number or name (or both) currently on the payee's account) to prevent backup withholding from starting or stop it once it has begun. Many payors informed the Service that in order to change a taxpayer identification number or name (or both) on an account it may be necessary for the payee to execute other documents of the payor in addition to the Form W-9. In response to this comment, this document revises the notice that payors must send to their payees so that it informs the payee of other documents that the payee must send to the payor in

order to change a taxpayer identification number or name (or both) on an account. This change is reflected in § 35a.3406-1(c)(1), (c)(3) (iv) and (vii), and the paragraph in the notice (which is an Appendix to § 35a.3406-1) entitled "Remember".

Several payors informed the Service that they had already purchased or designed a substitute notice in reliance on the Treasury decision. Thus, although the requirements of the notice are being changed by this document, the notice in the Treasury decision as described in § 35a.3406-1(c)(3) and set forth in the Appendix to the Treasury decision (or an acceptable substitute thereof) will be considered an acceptable substitute notice under this document.

The Treasury decision requires a payor to send the notice described in § 35a.3406-1(c) (i.e., the notice concerning potential backup withholding on the payee's account and requesting a certified taxpayer identification number) to the payee within 5 business days after receiving such notice from the Service or a broker. The date a payor receives the notice is crucial because (1) payors are required to begin backup withholding, when required, after the close of the 30th business day after the date the payor receives the notice, and (2) to exercise due diligence after being notified of an incorrect taxpayer identification number, a payor is required to send the notice as prescribed in § 35a.3406-1(c), i.e., within 5 business days after the notice is received. In order for the Service to determine whether backup withholding was applied, when required, and whether a payor exercised due diligence, the Service will date-stamp the notices. That date will be considered the effective date of the notice, i.e., the date that the payor receives the notice.

To avoid a large number of disputes arising between the Service and payors wherein payors contend that due to mail delays or change of addresses, they received the notice later than the notice's effective date, the Service will send the notices to payors approximately 2 or 3 weeks before their effective date. This 2-to-3-week period should be ample time to cover any mail delays.

Thus, the Service anticipates that there will be only a few instances in which a payor will receive a notice after its effective date. In such instances, the effective date of the notice is the actual date of receipt. This change is reflected in § 35a.3406-1(c)(1).

Under a literal reading of the Treasury decision a payor is required to send a



notice to a payee with respect to each account of the payee for which the Service or a broker notified the payor that such account contained an incorrect taxpayer identification number. Conceivably, a payee could have several accounts with a payor with incorrect taxpayer identification numbers which would require the payor to send multiple notices to a payee during a calendar year. To avoid this result, this document provides that a payor may send one notice to the payee provided that the one notice contains all the information required by the regulations. This change is reflected in § 35a.3406-1 (c)(2)(ii) and (f).

The Treasury decision also provides that if a payor is notified twice within 3 calendar years that a payee provided an incorrect taxpayer identification number and that incorrect taxpayer identification number is used on the account at the time the payor receives the second notice, the payor is required to impose backup withholding on the account. The payor may not stop backup withholding until the payor has been notified by the Internal Revenue Service pursuant to § 35a.3406-1(h) that the payee has provided a correct taxpayer identification number to the Service.

This document amends § 35a.3406-1(h) to provide that the Service will notify payors by providing the payee with a Form W-9 on which the payee has certified, under penalties of perjury, that his taxpayer identification number is correct and on which the Service places a stamp verifying that the taxpayer identification number is correct (as associated with the listed surname or business name on the form). A payee may take the Form W-9 to his payors or brokers, and the payors and brokers may obtain a copy of this Form W-9 or require the payee to execute a substitute Form W-9 in order to prevent backup withholding from starting under § 35a.3406-1(f)(3) or to stop it once it has begun. This revised procedure for notifying payors or brokers that a payee has provided a correct taxpayer identification number is reflected in this document in § 35a.3406-1 (h) and (j) *Example (6)* and *Example (7)*.

A question arose as to whether a notice from the Service or a broker as described in § 35a.3406-1(b) (1) or (2) that did not match the information on the payee's account when the notice is received (*i.e.*, same name on each but different taxpayer identification numbers) counts as a "first" notice for determining whether a payor has received two notices of an incorrect taxpayer identification number within 3 calendar years. This document clarifies

that only a notice from the Service (or a broker) that contains the same payee information as that on the payee's account is considered a "first" notice. This provision is reflected in this document in § 35a.3406-1(f)(1).

This document revises A-20 and A-27 of § 35a.9999-3 which concerns the application of backup withholding on payments that are reportable under section 6045. Generally, under A-20 and A-27 backup withholding applies on the sale date as defined under § 1.6045-1(d)(4) of the Income Tax Regulations. Section 1.6045-1(d)(4) provides that a broker may report a sale as occurring on the date the sale is entered on the books of the broker or the date the customer becomes entitled to the gross proceeds.

A problem arises with the existing A-20 and A-27 because, effective for information returns filed with respect to sales of property occurring after December 31, 1987, § 1.6045-1(d)(4) will be amended to provide that a broker shall report a "sale" as occurring on the date the "sale" is entered on the books of the broker (and not the date the customer becomes entitled to the gross proceeds). See Announcement 88-6, 1988-3 I.R.B. 52. Therefore, A-20 and A-27 are revised to require backup withholding on the "sale" date in accordance with the new rule that will be issued under section 6045.

The revised A-27 retains the provision under which a broker that is also the obligor on a debt security may elect to apply backup withholding on the payment date. However, this provision is modified under this document for "sales" of property after December 31, 1987, to allow the broker-obligor to apply backup withholding on the payment date if the payment date is later than the "sale" date.

#### Due Diligence

This document amends Q/A-10 of § 35a.9999-1 to provide that the forms that members of certain religious groups provide to the Service to become exempt from employment taxes will be deemed an acceptable substitute certified Form W-9. These forms contain the payee's name, address, and taxpayer identification number, as provided by the Service. This provision is added because, due to religious beliefs, these groups will not obtain a taxpayer identification number from the Social Security Administration.

This document also revises the administrative-relief rule under A-56 of § 35a.9999-1. Under the rule a payor who wanted to qualify for administrative relief from the penalty under section 6676(b) for filing an information return for the 1988 or a

subsequent calendar year with a missing or an incorrect taxpayer identification number for a pre-1984 account for which the payor failed to undertake the mailings as described in A-5 and A-6 and in the related questions and answers on due diligence must have sent a separate mailing by June 30, 1988, to all payees of pre-1984 accounts and instruments who have not provided a certified taxpayer identification number to the payor and undertake nonseparate annual mailings on such accounts in subsequent calendar years. The Service announced a revision to this rule in Notice 88-77, 1988-28 I.R.B. 26, to provide that a payor will not be ineligible for administrative relief (for those accounts for which the required mailing was made) due to an inadvertent failure to make a mailing with respect to a few accounts that could not be located using reasonable care.

This document further revises this rule. Also, a payor will not be ineligible for administrative relief in a calendar year (on those accounts for which the required mailing was made) due to the failure to make a mailing in such year on a *de minimis* number of accounts. A *de minimis* number of accounts is the lesser of 5,000 accounts or one percent (or less) of the total number of accounts for which a mailing should have been made under A-56 in such year.

Further, in its administrative discretion the Service will not enforce the penalty for a calendar year with respect to a *de minimis* number of accounts and those accounts that could not be located using reasonable care if the payor has undertaken a mailing as described in Q/A-5 in such year. Answer 56 is being revised in response to concerns of payors that they might be subject to annual penalties under section 6676(b) because of a failure to mail to such accounts in any one year.

Thus, under the revised rules of A-56 a payor who did not make a mailing to a *de minimis* number of accounts (or those accounts that could not be located using reasonable care) would be subject to a \$50 penalty for each account where no mailing was made. To avoid penalties in future years, that payor must make a separate mailing to such accounts in the following year and nonseparate mailings in all following years until a payee furnishes a certified taxpayer identification number. A payor must make a mailing at least annually with respect to all *de minimis* accounts (and all accounts that could not be located using reasonable care at the time of the required mailing under A-56 of section 35a.9999-1) in order to obtain

administrative relief in any calendar year.

To obtain administrative relief from the penalty the Treasury decision provides that the payor must make an affirmative showing to the satisfaction of the district director or the director of the Internal Revenue Service Center that the person otherwise liable for the penalty under section 6676(b) fulfilled the requirements of Q/A-56. Many payors inquired exactly how payors are supposed to make the "affirmative showing" and by what date. Therefore, this document further amends A-56 to provide that the payor must make a written statement, under penalties of perjury, affirmatively showing to the satisfaction of the district director or director of the Internal Revenue Service Center that the payor fulfilled the requirement of A-56.

This document also amends A-38 of § 35a.9999-3 which concerns the refunding of amounts that have been withheld erroneously due to an error by the payor. Several cases have come to the attention of the Service in which certain payees are subjected to backup withholding under section 3406(a)(1)(C) due to notified payee underreporting. Although these payees receive reportable interest or dividend income, that income is usually not subject to income tax due to the low income level of the payees. Therefore, withholding on their interest and dividend income under section 3406(a)(1)(C) usually occurs in error, in part, because these payees have failed to respond to the notices that the Service sends them about potential backup withholding.

Although the Service responds quickly to stop withholding in cases like these, presently there is no refund mechanism for the amounts withheld under A-39. Only amounts that are withheld erroneously can be refunded to a payee. Withholding is erroneous only if the withholding is the result of an error of the payor. Therefore, this document amends A-39 to provide that a payor will be considered to have withheld erroneously if the Service directs the payor to refund an amount withheld pursuant to section 3406(a)(1)(C).

Answer 51 of § 35a.9999-3 provides that a payor of a post-1983 account or instrument who permits a payee to open an account without obtaining the payee's taxpayer identification number under penalties of perjury and files an information return with the Service with a missing or an incorrect taxpayer identification number will be liable for the \$50 penalty under section 6676(b). Several payors commented that the penalty should not be imposed with respect to a calendar year if the payor

has received the Form W-9 even though it was received after the account was opened.

In response to this suggestion, this document amends A-51 to provide that in its administrative discretion the Service will not enforce the penalty with respect to a calendar year if the certified taxpayer identification is obtained after the account is opened and before December 31 of such year, provided that the payor exercises due diligence in processing such number, *i.e.*, the payor uses the same care in processing the taxpayer identification number provided by the payee that a reasonably prudent payor would use in the course of the payor's business in handling account information such as account numbers and balances. A payor is still liable for the amount that should have been withheld under section 3406(a)(1)(A) due to the payee's failure to provide a certified taxpayer identification number.

This document also revises Q/A-54 of § 35a.9999-3 to clarify the rules applicable to a grantor trust with ten or fewer grantors under sections 3406 and 6676(b). Under the revised rules, a grantor trust with ten or fewer grantors is not a payor for purposes of backup withholding. Thus, such a grantor trust is not required to impose backup withholding when it receives a reportable payment. Rather, the trustee of a grantor trust having ten or fewer grantors may not certify, under penalties of perjury, that the trust is not subject to backup withholding due to notified payee underreporting (when required) or that the taxpayer identification number provided by the trustee is correct unless each grantor has furnished the trustee with each such certification, and the trustee uses the taxpayer identification number on any Form 1041 that is filed by the trustee. Only grantor trusts that have more than ten grantors are considered payors for purposes of backup withholding.

This document also clarifies in A-54 the legal obligations under section 6676(b) of grantor trusts with ten or fewer grantors.

This document also adds a new Q/A-70A to § 35a.9999-3. Question and Answer 70A contains an exception to the general rules of due diligence for payors of reportable interest to life-insurance beneficiaries. The Service received several comments asserting that it is impractical to obtain a taxpayer identification number from a beneficiary prior to the time payment is required to be made to such beneficiary. This result obtains because an insured or annuitant has the unrestricted right to change the beneficiary up to the moment of death. Moreover, in many cases a

taxpayer identification number cannot be obtained in advance because the beneficiaries may be designated by class, *e.g.*, issue, heirs, surviving children, rather than by name. When the identity of the beneficiary is known at the time payment is required, the payor does request the taxpayer identification number from the payee. However, in some cases, it is not provided. In such cases the payor proceeds to make a lump-sum payment to the beneficiary as required under State law and has no further contact with the beneficiary. As a result, the payor has little or no opportunity to obtain the number and files an information return with a missing taxpayer identification number for which the payor is subject to the \$50 penalty. As a result of the problems experienced in this area, this document adds an exception to the due diligence rules for payors of reportable interest to life-insurance beneficiaries.

Answer 89 of § 35a.9999-3 provides, in part, that in order to exercise due diligence after two notifications of an incorrect taxpayer identification number within 3 calendar years, a payor must code all subsequent information returns that are filed with the words "2nd Notice". Answer 89 further provides that the manner in which the words "2nd Notice" should be set forth on the information return will be provided in a revenue procedure issued by the Internal Revenue Service.

This provision is added to the regulations so that a payor will not be renotified a third or subsequent time that the affected payee provided the same incorrect taxpayer identification number. Because payors will not be renotified under such circumstances, payors will not have to search their records with respect to the payee.

The Service expects that setting forth the 2nd-notice indication on the information return will ease some of the administrative burdens on payors. However, the Service has not received many comments from payors on the provision. The Service is interested in receiving comments on whether or not this provision is beneficial. If the provision would not result in a net benefit to payors, the Service will consider its removal.

#### Special Analyses

These rules are not major rules as defined in Executive Order 12291. Therefore, a Regulatory Impact Analysis is not required. A general notice of proposed rulemaking is not required by 5 U.S.C. § 553 for temporary regulations. Therefore, these rules do not constitute regulations subject to the Regulatory

Flexibility Act (5 U.S.C. Chapter 6) and a Regulatory Flexibility Analysis is not required.

#### Drafting Information

The principal author of these regulations is Renay France of the Office of the Assistant Chief Counsel (Income Tax and Accounting), Internal Revenue Service. However, other personnel from the Internal Revenue Service and the Treasury Department participated in their development.

#### List of Subjects in 26 CFR Part 35a

Employment taxes, Income taxes, Backup withholding, Interest and Dividend Tax Compliance Act of 1983.

#### Adoption of Amendments to the Regulations

Accordingly, 26 CFR Part 35a is amended as follows:

#### PART 35a—TEMPORARY EMPLOYMENT TAX REGULATIONS UNDER THE INTEREST AND DIVIDEND TAX COMPLIANCE ACT OF 1983

**Paragraph 1.** The authority for Part 35a continues to read in part:

Authority: 26 U.S.C. 7805; \* \* \*  
§ 35a.3406-1 also issued under 26 U.S.C. 3406 (a), (b), (e), (g), (h), and (i); 26 U.S.C. 6109; and 26 U.S.C. 6878.

#### § 35a.3406-1 [Amended]

**Par. 2.** Section 35a.3406-1 is amended as follows:

1. Paragraph (a)(1) is amended by removing the words "December 31, 1987" in the first sentence and by adding in their place the words "December 31, 1988".

2. Paragraph (a)(2)(ii)(A) is amended by removing the words "sections 6041(a) and" and by adding in their place the words "either sections 6041(a) or".

3. Paragraph (a)(3)(ii) is amended by removing the word "and" in the heading and in the text and by adding in its place the word "or".

4. Paragraph (d)(2)(ii) amended by removing the words "such certification" and by adding in their place the word "it".

5. Paragraph (e) is amended by adding the words "unless Q/A-48 of § 35a.9999-3 applies with respect to the accounts of a payee" immediately after the words "Internal Revenue Service pursuant to paragraph (b) (1) or (2) of this section".

6. Paragraph (j) is amended by removing the words "following examples:" in the first sentence and adding in their place the words "following examples in which it is assumed that a notice from the Internal Revenue Service is effective as of

January 1, 1988, and that the payor backup withholds under paragraph (d)(1) (i) or (ii), or under paragraph (f)(3) (i) or (ii) of this section:".

7. Paragraph (j) *Example (1)* is amended by removing the word "certification" in the sixth sentence and adding in its place the words "certified Form W-9 or an acceptable substitute form (hereinafter "certification")".

8. Paragraph (j) *Example (2)* is amended by removing the words "certified taxpayer identification number" in the second sentence and adding in their place the word "certification".

#### Appendix to § 35a.3406-1 [Amended]

9. The first paragraph of the Appendix to § 35a.3406-1 is amended by adding the words "the notice published in the Federal Register on November 23, 1987 (52 FR 44871) or to" immediately after the words "similar in content to", and by adding the words "*—You Must Provide Us With A Form W-9 (Even If We Already Have One On File For You).*" immediately after the words "*Important Tax Information—Please Read Carefully.*"

10. The fifth paragraph of the Appendix to § 35a.3406-1 entitled "*What to do*" is amended by removing the words "page 3" in the first sentence immediately after the words "(listed on" and adding in their place the words "page (insert correct page number)", by adding the words "if you have never been assigned a SSN," in the third sentence immediately after the word "Also,".

11. The fourth line from the end of the Appendix to § 35a.3406-1 captioned "Date" is amended by adding immediately below such line the words "(The portion below must be completed by the payor)".

12. Paragraphs (b)(5)(i), (c), (d) (1) and (2)(i), (f), (h), (j) *Example (6)* and *Example (7)*, and the paragraph in the Appendix to § 35a.3406-1 entitled "Remember" are revised to read as follows:

#### § 35a.3406-1 Imposition of backup withholding due to notification of an incorrect taxpayer identification number.

(b) *Notice regarding an incorrect taxpayer identification number.* \* \* \*

(5) *Reasonable care exception—(i) Payors.* Payors are not required to withhold on reportable payments made to an account of a payee that could not be located with reasonable care. A payor who satisfies the following two-part facts-and-circumstances test will be considered to have exercised reasonable

care for purposes of this paragraph (b)(5).

(A) Part one of the test is satisfied if the payor identifies and uses the appropriate computer or other record system on which to locate accounts of the payee subject to backup withholding under section 3406 (a)(1)(B). A payor with a centralized and fully integrated computer system containing all product lines of the payor that pay reportable payments will have identified and used the appropriate system if the payor searches on such system for all accounts of the payee described in paragraph (a)(1) of this section that are subject to backup withholding. A payor whose product lines paying reportable payments are on separate computer or records systems will have identified and used the appropriate system if the payor searches for accounts of the payee on the computer or record system that contains the product line with respect to which the payor received a notification of an incorrect taxpayer identification number pursuant to paragraph (b) (1) or (2) of this section.

(B) Part two of the test is satisfied if the payor uses or inputs the appropriate data or criteria into the system that is correctly identified under paragraph (b)(5)(i)(A) of this section. In general, a payor who uses or inputs the name, taxpayer identification number, and the account number provided on the notice from the Internal Revenue Service or a broker as described in paragraph (b) (1) or (2) of this section will satisfy part two of the test. In some cases the system of a payor cannot utilize the data enumerated in the preceding sentence for locating all accounts of the payee subject to backup withholding under section 3406(a)(1)(B). In such cases the payor must use or input the appropriate data or criteria, as determined by the capability of the payor's computer or record system.

(c) *Notice from payors of backup withholding due to an incorrect taxpayer identification number—(1) In general.* If the name and taxpayer identification number listed on the notice from the Internal Revenue Service or a broker as described in paragraph (b) (1) or (2) of this section matches the name and taxpayer identification number used on the payee's account at the time the payor receives the notification of an incorrect taxpayer identification number—

(i) The payor who receives a notice from the Internal Revenue Service is required under section 3406 (h)(8) to send a copy of the notice required by paragraph (b)(1) of this section or a

substitute notice as described in paragraph (c)(3) of this section to the payee of the account in accordance with paragraph (c)(2) of this section (an example of the notice from the Internal Revenue Service required by section 3406(h)(8) and paragraph (b)(1) of this section is set forth in the Appendix to these temporary regulations), and

(ii) The payor who receives notification of an incorrect taxpayer identification number from a broker as described in paragraph (b)(2) of this section must send a substitute notice as described in paragraph (c)(3) of this section to the payee in accordance with paragraph (c)(2) of this section.

However, a payor is not required to send a notice as described in this paragraph (nor backup withhold under paragraph (d) of this section) with respect to any account of a payee where, due to an error of the payor, the taxpayer identification number on such account is not the number that was provided to the payor on the applicable Form W-9 (or acceptable substitute form) because, for example, the payor transposed the identification number when incorporating it into its business records. If a payor sends a substitute notice, such notice must include all the information set forth in paragraph (c)(3) of this section or must be an acceptable substitute of the notice set forth in the **Federal Register** on November 23, 1987 (52 FR 44871). The notice set forth in the **Federal Register** on November 23, 1987 (52 FR 44871) is considered an acceptable substitute notice under paragraph (c)(3) of this section. In addition to the copy of the notice required by paragraph (b)(1) of this section or the substitute notice described in paragraph (c)(3) of this section, the payor must include a Form W-9 or an acceptable substitute form (as described in A-10 of § 35a.9999-1) with the notice for the payee to use to provide his name and taxpayer identification number and to certify that the taxpayer identification number is correct, or to provide his name and the taxpayer identification number that was originally furnished and to certify that such taxpayer identification number is correct. The payor is required to include a reply envelope (self-addressed) with the notice to the payee which may be, but is not required to be, postage prepaid. The envelope containing the notice and the Form W-9 (or an acceptable substitute form) must state on the outside in a bold and conspicuous manner: "Important Tax Document Enclosed". The mailing may not include any material other than the notice, the Form W-9 (or an acceptable substitute

form), any documents of the payor that are necessary to change the name or taxpayer identification number (or both) on the account of the payee, and the reply envelope of the payor. The notice required by paragraph (c) of this section, and not the notice required by A-39 of § 35a.9999-1 and in the Appendix to § 35a.9999-2, shall apply to those payors notified by a broker that a payee is subject to backup withholding under section 3406(a)(1)(B). For purposes of this section, the date set forth on the notice from the Internal Revenue Service (or a broker) shall be considered the date of receipt by and of notification to the payor. However, in the case of a dispute, if the payor demonstrates to the satisfaction of the Internal Revenue Service that the date of actual receipt of the notice is later than the date on the notice, the actual date shall be considered the date of receipt by and of notification to the payor.

(2) *Procedures*—(i) *In general*. The payor must send the notice described in paragraph (c) of this section to the payee within 5 business days after the date that the Internal Revenue Service or a broker notifies the payor pursuant to paragraph (b)(1) or (2) of this section. The payor must mail the notice to the payee's last known address by first-class mail. If it is the customary practice of the payor not to mail any correspondence to a payee, the payor may furnish the notice by personal delivery, by intra-office mail, or by any other means reasonably expected to furnish the notice to the payee promptly. A payor is not required to send the notice to the payee if there is currently a "do not mail" or a "stop mail hold" instruction with respect to the payee's account subject to backup withholding under section 3406(a)(1)(B). However, the payor must handle the notice in the same manner that the payor handles other correspondence of the payee.

(ii) *Two or more notices for a payee in the same calendar year*. A payor who receives, under the same payor employer identification number (or social security number), two or more notices described in paragraph (b)(1) or (2) of this section in a calendar year with respect to a payee may satisfy the requirements of this paragraph (c) with respect to such notices by sending one notice to the payee that satisfies the requirements of paragraph (c)(3) of this section.

(3) *Requirements of substitute notice to the payee*. If the payor does not send a copy of the notice received from the Internal Revenue Service pursuant to paragraph (b)(1) of this section or if the payor is notified by a broker as

described in paragraph (b)(2) of this section that the payee provided an incorrect taxpayer identification number, the payor may send a substitute notice as provided for in this paragraph (c)(3). A notice to the payee will satisfy the requirements of section 3406(h)(8) and paragraph (c)(1) of this section if the notice is identical to the one set forth in the **Federal Register** on November 23, 1987 (52 FR 44871) (or is an acceptable substitute thereof) or if the notice—

(i) Informs the payee that the payor has been notified that the taxpayer identification number furnished by the payee is an incorrect taxpayer identification number (as defined in paragraph (a)(6) of this section);

(ii) Advises the payee of the name and taxpayer identification number combination that the Internal Revenue Service has determined to be incorrect;

(iii) Informs the payee that the payee must either—

(A) Correct the surname (or business name) or taxpayer identification number (or both) and certify, under penalties of perjury, that the newly provided taxpayer identification number is correct, or

(B) State—

(1) Under penalties of perjury that the taxpayer identification number originally furnished to the payor is correct and provide that number and the corresponding listed surname (or business name),

(2) That the Social Security Administration (or the local office of the Internal Revenue Service in the case of an incorrect employer identification number) has been contacted by the payee to resolve the problem giving rise to the notification of an incorrect taxpayer identification number, or

(C) In the case of a notification of an incorrect taxpayer identification number of an individual payee due to a name change by the payee when the payee has not communicated the change of name to the Social Security Administration—

(1) Contact the Social Security Administration and reassign the taxpayer identification number to the surname that is used on the account with the payor, certify under penalties of perjury, that the existing taxpayer identification number shown on the account is correct (and provide the corresponding surname used with that number), and provide a statement that the Social Security Administration has been contacted to reassign the taxpayer identification number to the surname shown on the account, or

(2) Use both surnames on the account with the payor (the surname currently

shown on the account and the surname shown on the payee's Social Security Administration card if the payee is unable to contact the Social Security Administration at this time), provide the surnames, and certify under penalties of perjury that the furnished taxpayer identification number is correct, and

(3) Follow either paragraph (c)(3)(iii)(C) (1) or (2) of this section consistently with respect to all accounts with the payor;

(iv) Advises the payee of other necessary documentation (i.e., account creation documents) that the payee must provide to the payor in order to change the name or taxpayer identification number (or both) on the account and how to provide such information and the information described in paragraph (c)(3)(iii) of this section to the payor;

(v) Advises the payee to contact the Social Security Administration to obtain a social security card if the payee was never assigned a social security number or to obtain a replacement social security card if the payee lost his card and does not remember his social security number;

(vi) Advises the payee that as a result of providing an incorrect taxpayer identification number, the payor is required under section 3406(a)(1)(B) of the Internal Revenue Code to begin backup withholding 20 percent of—

(A) Reportable payments made to the payee no later than after the close of the day 30 business days after the date that the payor is notified of the incorrect taxpayer identification number if the payor has not received the required Form W-9 (or an acceptable substitute form) as described in paragraph (e) of this section, and either—

(B) Any withdrawals of reportable payments by the payee (or a joint payee in the case of a joint account) that occur after the close of 7 business days after the date that the payor received notice of the incorrect taxpayer identification number and before the day that is 31 business days after the day that the payor received notice of the incorrect taxpayer identification number, if the payee has not provided the payor with the required certified Form W-9 (or an acceptable substitute form) prior to any such withdrawals, or

(C) All reportable payments made to the payee (or a joint payee in the case of a joint account) after the close of 7 business days after the date that the payor received notice of the incorrect taxpayer identification number and prior to the beginning of the period described in paragraph (c)(3)(vi)(A) of this section, if the payor has not received the required certified Form

W-9 (or an acceptable substitute form) at the time of the reportable payments;

(vii) Gives the payee the date that the payor received the notice that the payee provided an incorrect taxpayer identification number;

(viii) States that the payee must complete and return the enclosed Form W-9 (or an acceptable substitute form), and, if necessary, other documents of the payor as described in paragraph (c)(3)(iv) of this section, and the statement that the payee contacted the Social Security Administration (or the Internal Revenue Service) before the time described in paragraph (c)(3)(vi) of this section in order to prevent backup withholding under section 3406(a)(1)(B) from starting, or after the time described in paragraph (c)(3)(vi) of this section to stop backup withholding once it has begun and to avoid the imposition of the penalty for failure to provide a correct taxpayer identification number; and

(ix) Advises the payee that the payor may, at its option, refund the amount withheld under section 3406(a)(1)(B) and paragraph (d)(1)(iii) of this section in accordance with the procedures described in Q/A-39 of § 35a.9999-3 if the payor receives a certified Form W-9 (or an acceptable substitute form) before the beginning of the period described in paragraph (c)(3)(iv)(A) (and paragraph (d)(1)(i)) of this section.

(4) *Payor must use newly provided certified number.* If the payor receives a certified Form W-9 (or an acceptable substitute form) from the payee in the manner required in paragraph (e) of this section before the end of a calendar year, the payor shall use the name and certified taxpayer identification number on the Form W-9 (or acceptable substitute form) on information returns that the payor is required to file for reportable payments made with respect to the payee for that year and subsequent calendar years. A payor who uses the name and certified taxpayer identification number on an information return as described in this paragraph will satisfy the requirement to provide this information to the Internal Revenue Service as prescribed in section 3406(h)(9).

(d) *Period during which backup withholding is required due to notification of an incorrect taxpayer identification number—(1) In general.* Except as provided in paragraph (d)(2) of this section, upon receiving a notice described in paragraph (b) (1) or (2) of this section, the payor must impose backup withholding on all reportable payments made to the payee that are subject to backup withholding during the following periods:

(i) After the close of the 30th business day after the date the payor receives the notice described in paragraph (b) (1) or (2) of this section and on or before the close of the 30th calendar day after the day the payor receives from the payee the certified Form W-9 (or acceptable substitute form) as described in paragraph (e) of this section, and either—

(ii) At the time of any withdrawal by the payee (or a joint payee in the case of a joint account) that occurs after the close of 7 business days after the date the payor receives the notice described in paragraph (b) (1) or (2) of this section to the extent of reportable payments made after receiving the notice described in paragraph (b) (1) or (2) of this section and before the earlier of—

(A) The date the payor imposes backup withholding under paragraph (d)(1)(i) of this section,

(B) The date the payor receives the certified Form W-9 (or an acceptable substitute form) described in paragraph (e) of this section, or

(C) The date of the withdrawal, or (iii) 7 business days after the date that the payor receives a notice described in paragraph (b) (1) or (2) of this section on all reportable payments made after the close of such 7 business days and prior to the beginning of the period described in paragraph (d)(1)(i) of this section.

For purposes of paragraph (d)(1)(ii), all cash withdrawals of an amount up to the amount of reportable payments made during the period beginning after the day that the payor receives the notice described in paragraph (b) (1) or (2) of this section to the end of the period described in paragraph (d)(1)(ii) (A), (B), or (C) of this section are treated as reportable payments. At the option of the payor, the term "cash" for purposes of this section may be limited to currency or a check issued to close out the account of a payee. Further, under this limitation, the term does not include a cash disbursement from an automatic teller machine nor an electronic transfer. The payor is required to backup withhold 20 percent of all reportable payments subject to backup withholding under section 3406 (a)(1)(B) that are made with respect to any account of the payee where that incorrect taxpayer identification number is used (or will be used) by a payor on an information return. However, the payor is not required to backup withhold on any account that could not be located using reasonable care. See paragraph (b)(5) of this section for the definition of reasonable care. At the option of the payor, the payor may refund the amount withheld during the period described in

paragraph (d)(1)(iii) if the payor receives a certified Form W-9 (or an acceptable substitute form) from the payee during such period provided that the account of the payee subject to backup withholding under this section is not also subject to backup withholding under section 3406(a)(1)(C) or (D) during such period. For purposes of the preceding sentence, the amounts withheld are deemed to be erroneously withheld as described in Q/A-39 of § 35a.9999-3. If a certified Form W-9 (or an acceptable substitute form) is not received by the payor prior to the period described in paragraph (d)(1)(i), *i.e.*, within the 30-business-day period, the amounts withheld shall not be refunded unless the amounts are erroneously withheld without regard to paragraph (d)(1) of this section.

(2) *Grace periods*—(i) *Starting backup withholding.* Pursuant to section 3406(e)(5)(A), the payor may elect, on a payee-by-payee basis or in general, to begin backup withholding at any time during the 30-business-day period described in paragraph (d)(1)(i) of this section. However, a payor electing to impose backup withholding under paragraph (d)(1)(ii) of this section must withhold on a withdrawal from the account of the payee as described in paragraph (d)(1)(ii) of this section.

(f) *Notification of two incorrect taxpayer identification numbers within a 3-year period*—(1) *In general.* If, with respect to a payee, a payor receives a notification as described in paragraph (b) (1) or (2) of this section twice within 3 calendar years, and if an existing account of the payee reflects the incorrect taxpayer identification number when the payor receives the second notice described in paragraph (b) (1) or (2) of this section, then the payor shall—

(i) Disregard any future certified Forms W-9 or acceptable substitute forms (described in paragraph (e) of this section) furnished by the payee with respect to existing accounts with the payor unless the Form W-9 (or acceptable substitute form) is furnished pursuant to paragraph (h) of this section.

(ii) Send the notice described in paragraph (f)(2) of this section to the payee (and not the notice required under paragraph (c) of this section) within 5 business days after the date that the payor receives the notice described in this paragraph (f), and

(iii) Impose backup withholding on any account containing the incorrect taxpayer identification number for the period described in paragraph (f)(3) of this section.

For purposes of this paragraph (f), a payor shall not count any notice as a

first notice unless the payor was required to notify the payee about the incorrect taxpayer identification number pursuant to paragraph (c)(1) of this section. Additionally, a payor shall treat the receipt of two or more notices in a calendar year as described in paragraph (b) (1) or (2) of this section with respect to the a payee as the receipt of one notice for purposes of this paragraph. The preceding sentence applies only with respect to a payor who received such two or more notices under the same payor employer identification number (or social security number). The payor who receives such two or more notices may satisfy the requirements of this paragraph by sending one notice to the payee that contains all the information described in paragraph (f)(1) of this section. The payor shall maintain sufficient records to determine whether the payor has received notices described in this paragraph and paragraph (b) (1) or (2) of this section twice within 3 calendar years with respect to a payee as described in this paragraph (f). The envelope containing the notice must state on the outside in a bold conspicuous manner: "Important Tax Document Enclosed". The payor is not required to include a Form W-9, nor is the payor required to include a reply envelope in the mailing of the notice to the payee. The payor may not include any material in the mailing of the notice described in this paragraph (f). The notice requirements provided in this paragraph (f), and not the notice requirements provided in A-39 of § 35a.9999-1 and in the Appendix to § 35a.9999-2, shall apply to a payor notified by a broker that a payee is subject to backup withholding under section 3406(a)(1)(B). The mailing procedure described in paragraph (c)(2) of this section shall apply to the mailing of the notice described in paragraph (f) of this section. A payor is not required to send a notice described in paragraph (f)(2) of this section (nor backup withhold under paragraph (f)(3) of this section) with respect to any account of a payee where, due to an error of the payor, the taxpayer identification number on such account is not the number that was provided to the payor on the applicable Form W-9 (or acceptable substitute form) because, for example, the payor transposed the taxpayer identification number when incorporating it into its business records.

(2) *Notice to payee who has provided two incorrect taxpayer identification numbers within 3 years.* The notice to the payee required by paragraph (f)(1) of this section must list, in a bold and conspicuous manner, the date the payor was notified of the second incorrect

taxpayer identification number, the payee's name, address (including street, city, state (or country), and zip or mailing code), and such other information that may be required by revenue procedures and revenue rulings. In addition the notice must state that—

(i) The payor has been notified that the taxpayer identification number furnished by the payee is incorrect, setting forth the name and taxpayer identification number that the Internal Revenue Service has determined to be incorrect and the specific account number that contains the incorrect taxpayer identification number;

(ii) The payor has been notified twice within 3 calendar years that the payee has furnished an incorrect taxpayer identification number on an account with the payor;

(iii) The payor is required to disregard any future taxpayer identification numbers, whether or not certified under penalties of perjury, received from the payee with respect to existing accounts with the payor unless the Internal Revenue Service has notified the payor that such taxpayer identification number is correct;

(iv) As a result of providing an incorrect taxpayer identification number, the payor is required under section 3406 (a)(1)(B) with respect to any existing account of the payee that contains that incorrect taxpayer identification number when the payor is notified that the number is incorrect as described in paragraph (f) of this section, to begin backup withholding 20 percent of—

(A) Reportable payments made to the payee no later than after the close of the day 30 business days after the date that the payor is notified of the incorrect taxpayer identification number, and—

(B) Either (1) any withdrawals of reportable payments by the payee (or a joint payee in the case of a joint account), or (2) all reportable payments that occur after the close of 7 business days after the date that the payor received the second notice of an incorrect taxpayer identification number and before the day that is 31 business days after the date that the payor received such notice if the Internal Revenue Service has not notified the payor that the payee provided a correct taxpayer identification number to the Internal Revenue Service as described in paragraph (h) of this section; and

(v) The payee must contact the Internal Revenue Service Center where the payee is required to file his income tax return in order to prevent backup withholding under section 3406 (a)(1)(B)

from starting or to stop it once it has begun.

(2) *Period during which backup withholding is required due to a second notification of an incorrect number within 3 years.* Upon receiving the second notice of an incorrect taxpayer identification number from the Internal Revenue Service or a broker as described in paragraph (f)(1) of this section, the payor must backup withhold on all reportable payments subject to backup withholding (as described in this paragraph) made to the payee—

(i) After the close of the 30th business day after the day on which the payor receives a notice described in paragraph (b) (1) or (2) of this section and ending as of the close of the 30th calendar day after the payor receives the notification from the Internal Revenue Service as described in paragraph (h) of this section and either—

(ii) At the time of any withdrawal by the payee (or a joint payee in the case of a joint account) that occurs after the close of 7 business days after the date the payor receives the notice described in paragraph (b) (1) or (2) of this section and before the earlier of—

(A) The date the payor imposes backup withholding as described in paragraph (f)(3)(i) of this section,

(B) The date the payor receives notification from the Internal Revenue Service as described in paragraph (h) of this section, or

(C) The date of withdrawal, or  
(iii) 7 business days after the date that the payor receives a notice described in paragraph (f)(1) of this section on all reportable payments made after the close of such 7 business days and prior to the beginning of the period described in paragraph (f)(3)(i) of this section.

For purposes of paragraph (f)(3)(ii) of this section, all cash withdrawals, as described in paragraph (d)(1) of this section, in an amount up to the amount of the reportable payments made during the period beginning from the day after the day that the payor received the notice described in paragraph (b)(1) or (2) of this section to the end of the period described in paragraph (f)(3)(ii) (A), (B), or (C) are treated as reportable payments. The payor is required to withhold 20 percent of all reportable payments that are made with respect to accounts that the payee maintains with the payor at the time the payor received the second notice of an incorrect taxpayer identification number if that incorrect taxpayer identification number is used by the payor on the account. However, the payor is not required to backup withhold on any account that could not be located using reasonable

care. See paragraph (b)(5) of this section for the definition of reasonable care. The payor may not stop backup withholding under paragraph (f)(3) of this section unless the payor has been notified pursuant to paragraph (h) of this section.

(4) *Grace periods*—(i) *Starting backup withholding.* Pursuant to section 3406(e)(5)(A), the payor may elect, on a payee-by-payee basis or in general, to begin backup withholding at any time during the 30-business-day period described in paragraph (f)(3)(i) of this section. However, a payor electing to impose backup withholding as described in paragraph (f)(3)(ii) of this section must backup withhold if there is a withdrawal from the account of the payee.

(ii) *Stopping backup withholding.* Pursuant to section 3406(e)(5)(B), the payor may elect, on a payee-by-payee basis or in general, to treat the notification from the Internal Revenue Service as described in paragraph (h) of this section as having been received at any time within 30 calendar days after such notification is provided and to stop backup withholding at any time within 30 calendar days of receiving such notice. See A-31 of § 35a.9999-1 for the application of the rule contained in this paragraph (f)(4)(ii).

(h) *Notice from the Internal Revenue Service to stop backup withholding.* A payor who received a notice pursuant to paragraph (f) of this section will be notified by the Internal Revenue Service to stop backup withholding after the Internal Revenue Service receives a correct taxpayer identification number from the payee. A broker who received a notice pursuant to paragraph (b) of this section will be notified by the Internal Revenue Service that the payee is no longer subject to backup withholding under section 3406(a)(1)(B) and that the broker is no longer required to provide notices to payors under paragraph (b)(2) of this section. A broker who receives a notice under this paragraph (h) from the Internal Revenue Service is not required to provide the notice to any payor to which the broker has previously provided the notice required under paragraph (b)(2) of this section. The Internal Revenue Service will notify a payor or a broker pursuant to this paragraph by providing the payee with a Form W-9 on which the payee has certified, under penalties of perjury, that his taxpayer identification number is correct. The Form W-9 will bear an official stamp of the Internal Revenue Service verifying that the taxpayer identification number on the Form W-9

is correct as associated with the listed surname or business name. A payee may provide a copy of the Form W-9 to his payors or brokers in order to prevent backup withholding under paragraph (f)(3) of this section from beginning or to stop it under paragraph (f)(4)(ii) once it has begun. In lieu of receiving a copy of the Form W-9 described in this paragraph, in its discretion, a payor or broker may require the payee to set forth his name and certify, under penalties of perjury, that his taxpayer identification number is correct (as set forth on the Form W-9 verified by the Internal Revenue Service) on the payor's or broker's substitute Form W-9 in order to prevent backup withholding under paragraph (f)(3) from beginning or to stop it under paragraph (f)(4)(ii) once it has begun.

(j) *Examples.* \* \* \*

\* \* \* \* \*

*Example (6).* Assume the same facts as in *Example (4)* except that the Internal Revenue Service notifies P again on November 9, 1990, that E's taxpayer identification number is incorrect. P is required to maintain its business records in a manner that P can determine that the Internal Revenue Service has notified P twice within a 3-year period that E's taxpayer identification number is incorrect. P is required to send the notice described in paragraph (f)(2) of this section to E. E does not make any withdrawal from the account after November 9, 1990. Under paragraph (f) of this section, P is required to begin backup withholding on reportable payments made after December 24, 1990 (after the close of the 30th business day after the day the Internal Revenue Service notifies P). P is required to continue backup withholding until P receives from the payee a copy of the notice from the Internal Revenue Service as described in paragraph (h) of this section.

*Example (7).* Individual F has three post-1983 accounts with Bank R that pay reportable interest: a checking account, a savings account, and a money market account. The checking and money market accounts were opened in 1986, and the savings account was opened in October of 1988. R treats each of these accounts as a separate account with the Bank. F provided R with the certifications as described under A-32 of § 35a.9999-1 at the time each account was opened. On June 1, 1988, the Internal Revenue Service notified R pursuant to paragraph (b)(1) of this section that F furnished an incorrect taxpayer identification number. From its business records, R determined that only the money market account contains the incorrect taxpayer identification number. R timely sends F the notice required under paragraph (b)(1) of this section and receives the certification required under paragraph (e) of this section from F on June 30, 1988. On November 15, 1990, the Internal Revenue Service notifies R that F furnished an incorrect taxpayer identification number. R checks all accounts of F and determines that only the savings account

contains the incorrect taxpayer identification number. Further, R determines from its business records that two notifications of an incorrect taxpayer identification number have been received with respect to F within 3 calendar years. R must send F the notice required under paragraph (f)(2) of this section and must commence backup withholding on reportable interest paid on the savings account pursuant to paragraph (f)(3) of this section after December 31, 1990. R must continue to backup withhold on the savings account until R receives from the payee a copy of the notice that was provided to the payee by the Internal Revenue Service as described in paragraph (h) of this section.

**Appendix to § 35a.3406-1 [Amended]**

\* \* \* \* \*

**Remember**

You must send us a signed form W-9 within 30 calendar days from the date shown at the top of page 1 even if the name and number (SSN or EIN) on your account with us match the name and number (SSN or EIN) on your social security card or the document issuing you an EIN. If we do not receive your Form W-9, any other documents that are necessary for us to change the name or TIN (or both) on your account to reflect the name and number on the newly provided Form W-9, and, if necessary, the statement that you contacted SSA or IRS within the 30-day period, we may be required to withhold 20 percent from any reportable payment that we pay to your account until we receive the necessary documents. Also, if you make a withdrawal from your account before the end of a 30-business-day period beginning after the close of 7 business days after the date that we receive notice of the incorrect taxpayer identification number and before we receive the necessary documents, we may be required to withhold 20 percent of reportable payments made to your account during such period.

Please complete the form below if you are required to contact SSA or the IRS.

\* \* \* \* \*

Par. 3. Section 35a.9999-1 is amended by revising A-10 and A-56 to read as follows:

**§ 35a.9999-1 Questions and answers concerning the due diligence requirement and the certification requirements in connection with backup withholding and other related issues.**

\* \* \* \* \*

**A-10.** Yes. A substitute form must include space for the payee to provide his name, address, and taxpayer identification number. The form also must include space for the payee to certify under, penalties of perjury, that he is furnishing his correct taxpayer identification number to the payor. The wording of the certification must be substantially similar to the following: "Under penalties of perjury, I certify that the number shown on this form is my correct taxpayer identification number." If a payor uses a substitute

form, the payor must provide either the Internal Revenue Service's instructions for Form W-9 or the substance of those instructions on or with the substitute form.

A signed copy of the Form 4029 or Form 8812 which contains the payee's name, address, and taxpayer identification number is deemed to be a substitute Form W-9 signed under penalties of perjury with respect to such number. However, the penalties associated with the penalties of perjury statement will not apply with respect to the taxpayer identification number on such form.

\* \* \* \* \*

**A-56.** Yes. The payor is liable for the penalty under section 6676(b) for each year the payor files an information return with a missing or an incorrect taxpayer identification number for a pre-1984 account or instrument if the payor has not exercised due diligence as described in A-5 and A-6 and in the related questions and answers on due diligence under this section or obtained a certified taxpayer identification number from the payee. However, in its administrative discretion the Internal Revenue Service will not impose the penalty on a payor for an information return filed for calendar years after 1987 if the payor makes or has made a separate mailing of the type described in A-5 (as applicable under such Q and A) on or before June 30, 1988, and makes or has made the nonseparate mailing described in A-5 (as applicable under such Q and A) in each year subsequent to the year of the separate mailing claimed as the basis for administrative relief. Such separate and nonseparate mailings must be made with respect to all pre-1984 accounts or instruments of payees to whom the payor will make a reportable payment in 1988 or a subsequent calendar year if such payees have not previously certified, under penalties of perjury, that the taxpayer identification number furnished to the payor is the payee's correct taxpayer identification number or established the payee's foreign status (under § 1.6049-5(b)(2)(iv)) with respect to interest payments or under Q and A 36 of § 35a.9999-3 with respect to dividend payments). If a reportable payment will not be made to a pre-1984 account or instrument in 1988, the mailing with respect to the account or instrument may be made, in the discretion of the payor, by (1) June 30, 1988, or (2) the later of October 1 of the calendar year in which the payment to the account or instrument is subsequently reportable or within 30 days after such reportable payment occurs.

A payor will not be ineligible for administrative relief under this Q/A-56 with respect to a calendar year (for those accounts for which mailings were made as described in this A-56) due to a failure to make a mailing with respect to a *de minimis* number of accounts. A *de minimis* number of accounts is the lesser of 5,000 accounts or one percent (or less) of the total number of accounts for which a mailing should have been made under this Q/A-56. In addition, a payor will not be ineligible for administrative relief with respect to a calendar year (for those accounts for which mailings were made as described in this A-56) due to an inadvertent failure to make a mailing for a few accounts that could not be located using reasonable care.

In its administrative discretion, the Internal Revenue Service will not impose the penalty under section 6676(b) on those *de minimis* accounts or on those accounts that could not be located using reasonable care in any calendar year for which a payor undertakes a mailing, as described in Q-5 in this section, with respect to *all* such accounts.

The rules described in A-5 and the related questions and answers on due diligence under this section shall apply, to the extent not inconsistent with this Q and A 56, as shall the rules described in A-8, A-9, A-10, A-11, A-12, A-14, A-15, and A-16. Further, the special rules in A-17, A-18, A-19, A-20, A-21, A-22, A-23, A-24, and A-25 also shall apply to the mailing described in A-56 of this section.

In order to receive administrative relief each year, a payor must make a written statement, under penalties of perjury, affirmatively showing to the satisfaction of the district director or the director of the Internal Revenue Service Center that the person otherwise liable for such penalty fulfilled the requirements of this paragraph. A payor should make the request from the Internal Revenue Service ninety days before the due date of the Form 8210. A payor will remain liable for any applicable penalties under section 6676(b) for years prior to 1988.

\* \* \* \* \*

**§ 35a.9999-2 [Amended]**

Par. 4. Section 35a.9999-2 is amended by adding the sentence "See Q/A-54 of § 35a.9999-3 which revises the rule in this paragraph." at the end of the third paragraph in A-20.

**§ 35a.9999-3 [Amended]**

Par. 5. Section 35a.9999-3 is amended as follows:



1. In A-4 the following words, "(and Announcement 88-6, 1988-3 I.R.B. 52)", are added to the third sentence in the sixth paragraph immediately after the words, "See § 1.6045-1(d)(4) and (f)(3) of the Income Tax Regulations".

2. In Q-16 the words "section 6041?" are removed and the words "section 6041 or effective for royalty payments made after December 31, 1986, section 6050N?" are added in their place.

3. The following sentence is added at the end of A-48, "The payee must provide the actual Form W-9 or acceptable substitute form to the fund (or payor) in order for this A-48 to apply."

4. In Q-59 the words "and before July 1, 1988," are added immediately after the words "awaiting-TIN certification)".

5. In A-60 the words "was acquired by the payee through a post-1983 brokerage account" in the first sentence are removed and the words "is not a pre-1984 account of the payor" are added in their place.

6. In Q/A-85 the word "1988" is removed in each place that it appears and the word "1989" is added in its place.

7. In Q-87 the word "1988" is removed and the word "1989" is added in its place.

8. In A-87 the word "or" is removed and the word "order" is added in its place.

9. In Q-88 the word "1988" is removed and the word "1989" is added in its place.

10. In A-93 the words "1984 and 1985" are removed from the second sentence and the words "1984, 1985, 1986, and 1987" are added in their place, and the word "1986" is removed from the last sentence and the word "1988" is added in its place.

11. In A-95 the words "1984 and 1985" are removed from the first sentence and the words "1984, 1985, 1986, and 1987" are added in their place.

12. Q/A-104 is redesignated as Q/A-105.

13. Answer 27, A-38, A-51, Q/A-54, A-59, A-62, A-86, A-89 and A-97 are revised, in addition, a new Q/A-59A, a new heading and a Q/A-70A, and a new Q/A-104 are added immediately after Q/A-59, Q/A-70, and Q/A-103, respectively. The revised and added provisions read as follows:

**§ 35a.9999-3 Questions and answers concerning backup withholding.**

\* \* \* \* \*

A-27. With respect to the retirement or redemption of a debt security before January 1, 1988, backup withholding applies on the sale date under § 1.6045-1(d)(4) of the Income Tax Regulations.

Additionally, a broker that is also the obligor on a debt security may elect to apply backup withholding on the payment date.

With respect to the retirement or redemption of a debt security after December 31, 1987, backup withholding applies on the date the "sale" is entered on the books of the broker. Additionally, a broker that is also the obligor on a debt security may elect to apply backup withholding on the payment date if later than the "sale" date.

A broker must determine whether backup withholding applies on the same date (either the date entered on the books of the broker or the payment date) for all similarly situated payees receiving payments on the same type of debt security.

\* \* \* \* \*

A-38. If a payor erroneously withholds tax or withholds more than the proper amount of the tax, the payor may refund the amount withheld as provided in section 6413 and A-39. A payor shall be considered to have withheld erroneously only if (1) the amount is withheld because of an error by the payor (e.g., an error in "flagging" or identifying an account that is subject to backup withholding), or (2) the Internal Revenue Service directs the payor to refund an amount withheld pursuant to section 3406(a)(1)(C). If the payor requires a payee described in § 31.3452 (c)-(1) (b) through (p) of the Employment Taxes and Collection of Income Tax at Source Regulations (e.g., a corporation) (See T.D. 7880, 1983-1 C.B. 242, 251, Removed by T.D. 7949, 1984-1 C.B. 204) to certify as to its status as exempt from backup withholding, the payee fails to make the required certification, and the payor subsequently withholds the tax from a payment to such payee, the payor may, in its discretion, treat the amount withheld as an amount erroneously withheld and refund it to the payee. The result is the same if the payor does not require such a payee to certify as to its status and the payor withholds.

If a payor withholds from a payee after the payee provides a taxpayer identification number or required certification to the payor but before the payor has processed the number or required certification (i.e., prior to the time that the payor is treated as having received the number or certification under A-17 of § 35a.9999-2), the payor may, in its discretion, treat the amount withheld as an amount erroneously withheld and refund it to the payee. If a payor withholds, however, because the payor has not received a taxpayer identification number or required

certification and the payee subsequently provides a taxpayer identification number or the required certification to the payor, the payor may not refund the tax to the payee because the payor properly imposed backup withholding. The amount withheld is a credit against tax that the payee may take into account in computing estimated tax payments and may claim on the payee's income tax return.

\* \* \* \* \*

A-51. In general, the payor of an account or instrument that is not a pre-1984 account (see A-34 of § 35a.9999-1 and A-20 of § 35a.9999-3) nor a window transaction (as defined in A-42 of § 35a.9999-1 and A-9 of § 35a.9999-2) must use a taxpayer identification number provided by the payee under penalties of perjury on information returns filed with the Internal Revenue Service to satisfy the due diligence requirement. Therefore, if, after 1983, a payor permits a payee to open an account without obtaining the payee's taxpayer identification number under penalties of perjury and files an information return with the Internal Revenue Service with a missing or an incorrect taxpayer identification number, the payor will be liable for the \$50 penalty for the year with respect to which such information return is filed. However, in its administrative discretion, the Internal Revenue Service will not enforce the penalty with respect to a calendar year if the certified taxpayer identification number is obtained after the account is opened and before December 31 of such year, provided that the payor exercises due diligence in processing such number i.e., the payor uses the same care in processing the taxpayer identification number provided by the payee that a reasonably prudent payor would use in the course of the payor's business in handling account information such as account numbers and balances. See Q/A-73 of this section.

Once notified by the Internal Revenue Service (or a broker) that a number is incorrect, a payor is liable for the penalty for all prior years in which an information return was filed with that particular incorrect number if the payor has not exercised due diligence with respect to such years. See A-56 through A-70A of this section for the exceptions to due diligence. A pre-existing certified taxpayer identification number does not constitute an exercise of due diligence after the Internal Revenue Service or a broker notifies the payor that the number is incorrect if the Internal Revenue Service or a broker notifies the payor on or after January 1, 1989, unless

the payor undertakes the actions specified in A-88 of this section.

\* \* \* \* \*

Q-54. What are the legal obligations with respect to a grantor trust with ten or fewer grantors under sections 3406 and 6676(b)?

A-54. Backup withholding will apply to a reportable payment to a grantor trust with ten or fewer grantors that was established on or after January 1, 1984, if one of the conditions for imposing backup withholding exists with respect to the trust. The trustee of a grantor trust with ten or fewer grantors may not certify either that the trust is not subject to backup withholding due to notified payee underreporting or that the trust's taxpayer identification number provided by the trustee is correct unless each grantor has furnished the trustee with certifications, signed under penalties of perjury, that the grantor is not subject to backup withholding due to notified payee underreporting and that the grantor's taxpayer identification number provided to the trustee is correct, and the trustee uses such taxpayer identification numbers provided by the grantors on any Form 1041 that is filed by the trustee pursuant to section 671.

Effective June 12, 1989, a trustee of a grantor trust with ten or fewer grantors is not considered a payor for purposes of backup withholding. Therefore, distributions by the trust of amounts to beneficiaries will not be considered payments of reportable amounts subject to backup withholding. With respect to reportable payments (except gross proceeds reportable under section 6045) made prior to the above period, see Q/A-20 of § 35a.9999-2 under which a grantor trust with ten or fewer grantors is considered a payor for purposes of backup withholding.

However, a grantor trust with ten or fewer grantors may be a payor under the respective information reporting sections. As such, the trust may be subject to the penalty under section 6676(b) for filing an information return with a missing or an incorrect taxpayer identification number. No penalty, however, will be imposed on the trust with respect to information returns filed for the 1987 or 1988 calendar year.

\* \* \* \* \*

A-59. In order to exercise due diligence a payor who receives a post-1987 awaiting-TIN certification from a payee before July 1, 1988, must: (1) Obtain a certified taxpayer identification number from the payee within 60 days after the date that the payor receives the awaiting-TIN certification, and (2) backup withhold on any withdrawals made after the close of

7 business days after the date the awaiting-TIN certification is received and before the earlier of (i) the date that the payor receives a certified taxpayer identification number from the payee, (ii) the date the account is closed, or (iii) the date backup withholding commences on all reportable payments made to the account, instrument, or relationship. For purposes of subsection (ii) in this A-59, a payor is also required to backup withhold on any reportable payment made at the time the account or relationship is closed. For purposes of subsection (2) in this A-59, all cash withdrawals in an amount up to the reportable payments made from the day after the date of receipt of the awaiting-TIN certification to the date of withdrawal are treated as reportable payments. For purposes of this Q/A-59, the term "cash" has the same meaning as the term "cash" set forth in § 35a.3406-1(d)(1) of T.D. 8163, 52 FR 44867. Thus, a payor who receives a post-1987 awaiting-TIN certification (as described in this Q/A-59) from a payee who does not provide the payor with a certified taxpayer identification number within the 60 days described in A-18 of § 35a.9999-2 is liable for the penalty if reportable payments are paid to the account after the 60 days and the payor files an information return with respect to the account with a missing taxpayer identification number. The payor is liable for the penalty whether or not the payor backup withholds on the reportable payments made after the 60-day period.

However, in its administrative discretion, the Internal Revenue Service will not enforce the penalty for a calendar year against a payor who has properly withheld under this Q/A-59 if the payor (A) obtains the certified taxpayer identification number after the 60-day period (described above) and before December 31 of such calendar year, provided that the payor exercises due diligence in processing such number on the information return filed for such year, *i.e.*, the payor uses the same care in processing the taxpayer identification number provided by the payee that a reasonably prudent payor would use in the course of the payor's business in handling account information such as account numbers and balances (See Q/A-73 of this section), or (B) effective with respect to the 1988 and subsequent calendar years, undertakes an annual mailing as described in Q/A-59A of this section. The 1988 annual mailing must be made between January 1, 1988, and June 12, 1989.

Q-59A. What actions must a payor take in order to exercise due diligence on an account, instrument, or

relationship for which the payor receives a post-1987 awaiting-TIN certification on or after July 1, 1988?

A-59A. In order to exercise due diligence a payor who receives a post-1987 awaiting-TIN certification on or after July 1, 1988, may elect on a payee-by-payee basis or in general to: (1) Follow the rules for due diligence as set forth in Q/A-59 above, (2) follow such due diligence rules but apply the definition of the term "cash" set forth in § 35a.3406-1(d)(1), or (3) commence backup withholding on the account no later than 7 business days after the date the payor receives the awaiting-TIN certification on reportable payments thereafter made to the account (whether or not the payee makes a cash withdrawal). Under (3) above the payor must backup withhold until the earlier of (i) the date the payor receives a certified taxpayer identification number from the payee, (ii) the date the account is closed, or (iii) the date backup withholding commences on all reportable payments made to the account, instrument, or relationship. In addition with respect to (3), a payor must obtain a certified taxpayer identification number from a payee within 60 days after the date that the payor receives the awaiting-TIN certificate or undertake a mailing each year as described in Q/A-5 and 6 of § 35a.9999-1 (except that the first required mailing may be, but need not be, a separate mailing) soliciting the certified taxpayer identification number from the payee. The payor must make a mailing each year until the earlier of (i) the calendar year that the certified taxpayer identification number is received, or (ii) the calendar year in which the account is closed. However, if the account is closed in December of a calendar year, the mailing must be made after the account is closed and before January 31 of the subsequent calendar year.

Effective August 16, 1988, a payor who has elected to apply subsection (3) above must refund the amounts withheld during the 60-day period in accordance with the procedures described in Q/A-39 of this section if the payor receives the certified taxpayer identification number from the payee on or after August 16, 1988, and within the 60-day period, provided that the payee is not subject to backup withholding under section 3406(a)(1) (C) or (D) during any part of such period. For purposes of the preceding sentence, the amounts withheld are deemed to be withheld erroneously as described in Q/A-39 of this section. If a certified taxpayer identification number is not received by the payor within the 60-day period, the

amounts withheld shall not be refunded unless the amounts are erroneously withheld without regard to the rules described in this Q/A-59A. The payor is also required to backup withhold after the 60-day period until the payor receives a certified taxpayer identification number from the payee or the account is closed.

\* \* \* \* \*

**A-62.** A payor who is notified by a broker that a payee failed to certify or furnish a taxpayer identification number to the broker will be considered to have exercised due diligence if the payor: (1) Imposes backup withholding if the payee did not certify his taxpayer identification number to the payor, (2) provides notice to the payee as provided in A-39 of § 35a.9999-1 and A-18 of § 35a.9999-2, and (3) encloses a postage-paid reply envelope (self-addressed) in the mailing of the notice. A payor described in this A-62 will be liable for the penalty under section 6676(b) for filing an information return with a missing taxpayer identification number for the 1988 or subsequent calendar years unless the payor complies with the procedures described in this A-62 in each such calendar year until the payor receives a certified taxpayer identification number from the payee or until the account is closed. A subsequent mailing is required to contain a reply envelope which may, but is not required to be, postage prepaid. For years prior to 1988, no penalty will be imposed on a payor who has complied with the requirements in this A-62 in the year the payor was notified by a broker.

A payor as described in this A-62 who receives a noncertified taxpayer identification number from a broker may be liable for the penalty under section 6676(b) for the 1988 or subsequent calendar years with respect to which the number provided by a payor on an information return filed with the Internal Revenue Service is determined to be incorrect unless the payor complies with the procedures described in this A-62 in each such calendar year until the payor receives a certified taxpayer identification number from the payee, the account is closed, or the payor undertakes the actions described in A-88 of this section after being notified of the incorrect taxpayer identification number.

*(8) Life-Insurance Beneficiaries*

**Q-70A.** Under what circumstances will a payor of reportable interest to a beneficiary of a life-insurance contract be considered to have exercised due diligence?

**A-70A.** Generally, a payor of reportable interest to a beneficiary of a life-insurance contract under which payment to the beneficiary commenced on or before December 31, 1983, will be considered to have exercised due diligence with respect to a calendar year if: the payor (1) uses a taxpayer identification number provided by the payee beneficiary under penalties of perjury as described in Q/A-51 of this section on the information return filed for such year, or (2) undertakes a mailing as described in Q/A 5 or 6 (or Q/A-56) of § 35a.9999-1 prior to or at the time of payment, and (3) backup withholds on the reportable interest paid to the account if no taxpayer identification number has been provided (See Q/A-34 of § 35a.9999-1).

A payor of reportable interest to a beneficiary of a life-insurance contract under which payment to the beneficiary commenced on or after January 1, 1984, will be considered to have exercised due diligence with respect to a calendar year if the payor: (i) uses a taxpayer identification number provided by the payee-beneficiary under penalties of perjury as described in Q/A-51 of this section on the information return filed for such year, or (ii) effective with respect to the 1989 and subsequent calendar years, undertakes a mailing as described in Q/A-5 and 6 of § 35a.9999-1 prior to or at the time of payment.

With respect to payments of reportable interest in calendar years prior to the 1989 calendar year (on a life-insurance contract under which payments to the beneficiary commenced on or after January 1, 1984), a payor will be considered to have exercised due diligence if the payor requested a certified taxpayer identification number from the payee beneficiary prior to, or at the time of, the reportable interest payment provided that at the time of such request the payor had in effect written procedures or policies that required the solicitation of the certified taxpayer identification number of the payee beneficiary prior to or at the time of payment.

\* \* \* \* \*

**A-86.** No. A payor of a pre-1984 account or instrument is not required to undertake the mailings prescribed in A-5 and A-6 of § 35a.9999-1 (or A-56 of § 35a.9999-1) in any year in which the payor is also required to send the notice prescribed in § 35a.3406-1(c) (or in § 35a.3406-1(f)(2)). Thus, for example, assume that Payor X pays reportable interest on a pre-1984 account and has undertaken all the prescribed mailings in A-5 and A-6 by December 31, 1989, for the account of Payee A. Also assume

that Payor X filed the calendar year 1984 return on February 28, 1985, with respect to Payee A with an incorrect taxpayer identification number and the 1985, 1986, 1987, and 1988 calendar year information returns on February 28, 1986, March 2, 1987, February 29, 1988, and February 28, 1989, respectively, with the same incorrect taxpayer identification number. Payor X has filed neither a Form 8210 for any of these years to remit the penalty under section 6676(b) nor the certification statement set forth in CP2100 (or letter 2137) for calendar years before 1988. In October of 1989 the Internal Revenue Service notifies Payor X that the number set forth on the 1988 calendar year information return (*i.e.*, filed in 1989 with respect to Payee A) was filed with an incorrect taxpayer identification number. Under these facts, Payor X is not liable for the penalty for filing the 1988 information return with an incorrect taxpayer identification number because (1) Payor X filed the 1988 information return before being notified by the Internal Revenue Service of the incorrect taxpayer identification number, and (2) Payor X exercised due diligence in 1988 through the prescribed annual mailing (*i.e.*, Payor X made the separate mailing in 1983 and the nonseparate mailings in 1984, 1985, 1986, 1987, and 1988 with respect to Payee A). Similarly, Payor X is not liable for the penalty for the 1984, 1985, 1986, and 1987 calendar year information returns filed on February 28, 1985, February 28, 1986, March 2, 1987, and February 29, 1988, respectively.

Payor X will be liable for the penalty, however, for filing the 1989 calendar year information return with the same incorrect taxpayer identification number (*i.e.*, the number that the Internal Revenue Service notified was incorrect) unless Payor X (1) sends the notice information as described in § 35a.3406-1(c), and (2) uses the certified taxpayer identification number that is furnished by the payee, if one is received before the end of 1989, on the information return that is filed for the 1989 calendar year. If Payor X sends the notice described in § 35a.3406-1(c) in the 1989 calendar year, Payor X is not also required to send the mailing described in A-5 and A-6 (or A-56) of § 35a.9999-1 in 1989. If the payee does not provide a new taxpayer identification number to the payor, the payor must continue to use the existing taxpayer identification number on information returns filed for such payee.

\* \* \* \* \*

**A-89.** The payor (1) must send the notice to the payee as prescribed in

§ 35a.3406-1(f)(2), (2) must code all subsequent information returns that are filed in the calendar year after the calendar year in which the second notice is received with the words "2ND NOTICE", and (3) must, if the payor receives from the payee a copy of the notice from the Internal Revenue Service that the payee has provided a correct taxpayer identification number as described in paragraph (h) of § 35a.3406-1, obtain and use such name and taxpayer identification number combination on the information returns that are filed after the calendar year in which the name and number are received.

A payor shall not count any notice received from the Internal Revenue Service or a broker prior to January 1, 1990, as the second of two notices within 3 calendar years. Further, a payor shall treat two or more notices received in a calendar year with respect to a payee as one notice received in that calendar year for that payee. The preceding sentence applies only with respect to a payor who receives such two or more notices under the same payor employer identification number (or social security number). See § 35a.3406-1(f).

\* \* \* \* \*

A-97. No. See Q/A-23 of § 35a.9999-2.

\* \* \* \* \*

Q-104. Is a payor required to retain the "statement of SSA or IRS contact" (as described in the Appendix to § 35a.3406-1) that a payee has returned to the payor?

A-104. No. A payor is not required to retain the "statement of SSA or IRS contact"

\* \* \* \* \*

There is a need for immediate guidance with respect to the provisions contained in this Treasury decision. For this reason, it is found impracticable to issue it with notice and public procedure under subsection (b) of section 553 of Title 5 of the United States Code or subject to the effective date limitation of subsection (d) of that section.

Lawrence B. Gibbs,

Commissioner of Internal Revenue.

Approved: January 31, 1989.

O. Donaldson Chapoton,

Assistant Secretary of the Treasury

[FR Doc. 89-8040 Filed 4-10-89; 8:45 am]

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## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Parts 35 and 130

[OW-FRL-3453-6]

#### Indian Tribes: Water Quality Planning and Management

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Interim Final Rule with request for comments.

**SUMMARY:** Section 518 of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987 (P.L. 100-4, February 4, 1987) requires EPA to promulgate regulations to allow Indian Tribes to be treated as States for various provisions of the Act. This interim rule establishes procedures for Indian Tribes to qualify to be treated as States and for award of grants to these Tribes with funds provided under sections 106, 205(j)(1), 205(j)(5), 314 and 319 of the Act. This action will facilitate the award of Federal assistance to Indian Tribes that qualify for treatment as States.

**DATES:** This Interim Final Rule is effective April 11, 1989. Comments on this rule must be submitted on or before June 12, 1989.

**ADDRESS:** Send written comments to: Donald J. Brady, Analysis and Evaluation Division (WH-586), Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. Copies of the comments and supporting documents are available for review during normal business hours at the EPA, Room 737 East Tower, 401 M Street SW., Washington, DC 20460.

**FOR FURTHER INFORMATION CONTACT:** Donald J. Brady, Analysis and Evaluation Division (WH-586), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460 at (202) 382-5392.

**SUPPLEMENTARY INFORMATION:** The contents of today's preamble are listed in the following outline:

#### I. Introduction

- A. Statutory Authority
- B. Background of the Rulemaking

#### II. Treatment of Indian Tribes as States

- A. Federal Recognition
- B. Substantial Governmental Duties and Powers
- C. Tribal Authority
- D. Tribal Capability

#### III. Program Grants

- A. Eligibility and Availability
- B. Matching and Level-of-Effort Requirements
- C. Work Program Development

D. FY 1988 and FY 1989 Funding

#### IV. Program Requirements

#### V. Request for Public Comments

#### VI. Impact Analysis

- A. Regulatory Impact Analysis
- B. Paperwork Reduction Act

#### I. Introduction

##### A. Statutory Authority

The Water Quality Act of 1987 amended the Clean Water Act (the Act) 33 U.S.C. 1251 *et seq.*, by adding a new section 518 entitled "Indian Tribes." The Act authorizes EPA to treat Federally recognized Indian Tribes as States for certain provisions, including financial assistance. The Act requires EPA to promulgate regulations specifying how Indian Tribes should be treated as States for purposes of the Act.

Section 518(e) establishes three broad tests an Indian Tribe must meet before treatment as a State is authorized:

(1) The Indian Tribe has a governing body carrying out substantial governmental duties and powers; (2) the functions to be exercised by the Indian Tribe pertain to the management and protection of water resources which are held by an Indian Tribe, held by the United States in trust for Indians, held by a member of an Indian Tribe, if such property interest is subject to a trust restriction on alienation, or otherwise within the borders of an Indian reservation; and (3) the Indian Tribe is reasonably expected to be capable, in the Administrator's judgment, of carrying out the functions to be exercised in a manner consistent with the terms and purposes of the Act and of all applicable regulations.

In addition, the Act also requires that the Indian Tribe be Federally recognized by the Secretary of the Interior and exercise governmental authority over a Federal Indian Reservation.

##### B. Background of the Rulemaking

This interim final regulation is consistent with the President's and EPA's Policy statements regarding Indian Tribes. On January 24, 1983, President Reagan signed a Federal Indian Policy Statement providing for treatment of Tribal governments on a government-to-government basis and supporting the principle of self-determination and local decision-making by Indian Tribes. EPA responded to the President's statement by developing a discussion paper entitled "Administration of Environmental Programs on Indian Lands" in July 1983, and subsequently developing the EPA Indian Policy Statement and Implementation Guidance in November 1984.

EPA's Indian Policy statement directs the Agency to "give special consideration to Tribal interests in making Agency policy and to insure the close involvement of Tribal governments in making decisions and managing the environmental programs affecting Reservation lands." In implementing this policy, EPA works directly with Tribal governments as independent authorities for Reservation affairs, recognizing that Tribes are sovereigns, not political subdivisions of States.

EPA formed a work group in June 1987, comprised of Regional and Headquarters personnel and three Indian Tribal representatives, to develop regulations that would implement the Clean Water Act amendments pertaining to sections 106, 205(j)(1), 205(j)(5), 314 and 319. In August 1987, a concept paper outlining EPA's proposed approach to treatment of Tribes as States and award of grant funds to Tribes, was presented at three national meetings with Indian Tribes in Albuquerque, New Mexico; Denver, Colorado; and Duluth, Minnesota. A work group meeting was held in November 1987 to develop draft regulations. In June 1988, the Agency met with both Tribal and State representatives in Denver, Colorado.

The following interim final rule reflects the comments received on the concept paper and the results of the work group discussions and June meeting. It is promulgated as interim final, rather than as a proposed rule, in accordance with the Administrative Procedure Act, 5 U.S.C. 553(a), which exempts grants rules from the requirements for proposed rulemaking. The Agency believes this will expedite the prompt award of assistance to Indian Tribes in furtherance of Congressional intent.

The interim final rule explains how EPA will determine if Indian Tribes are eligible for treatment as States under sections 106, 205(j)(1), 205(j)(5), 314 and 319. The rule explains what requirements EPA will use to determine if Tribes qualify for treatment as States, the grant application procedures to be employed by qualifying Tribes and program and grant management requirements with which Tribes receiving grants must comply. The criteria to be used in determining whether a Tribe is to be treated as a State are set forth in a new § 130.2 of 40 CFR Part 130.

## II. Treatment of Indian Tribes as States

### A. Federal Recognition

The Secretary of the Interior periodically publishes a list of Federally

recognized Tribes. The applicant can use this list to establish the fact that it has Federal recognition. If the Tribe is not listed it may supply EPA with other documentation that it is recognized by the Secretary of the Interior.

### B. Substantial Governmental Duties and Powers

With regard to section 518(e)(1), EPA considered what "carrying out substantial governmental duties and powers" means. Many Indian Tribal governments perform essential governmental functions traditionally performed by sovereign governments. The factors the Regional Administrator may consider include, but are not limited to, the power to tax, the power of eminent domain and the police power (i.e., the power to provide for the public health, safety and general welfare of the affected population). This list is purely illustrative and it is not necessary that a Tribe be performing each such function to qualify for treatment as a State, as long as the Tribe can satisfy the statutory requirement of "carrying out substantial governmental duties and powers."

The Agency believes that most Tribes will be able to meet this criterion without much difficulty. Accordingly, this regulation minimizes the burdens to a Tribe in demonstrating that it is carrying out substantial governmental duties and powers. The Agency requires a narrative statement: (1) Describing the form of Tribal government; (2) describing the types of essential governmental functions currently performed; and (3) identifying the sources of authorities to perform these functions (e.g., Tribal constitutions, codes, etc.).

### C. Tribal Authority

The Agency has a statutory obligation to determine that a Tribe exercises management and protection functions over a water resource before treating the Tribe as a State for purposes of that water resource. Section 518(e)(2) states a Tribe may be treated as a State only if "the functions to be exercised by the Tribe pertain to the management and protection of water resources \* \* \* within the borders of an Indian reservation." We interpret this language to mean that the Agency can award grants for work within the exterior boundaries of a reservation.

The Agency recognizes that a Tribe will ordinarily have authority to administer Clean Water Act programs within reservation boundaries. Thus, to meet the requirement of section 518(e)(2), a Tribe should submit a statement signed by the Tribal Attorney

General or an equivalent official explaining the legal basis for the Tribe's regulatory authority over its water resources. Once a Tribe has submitted such a statement, EPA will issue a notice to appropriate governmental entities, who will have fifteen days to comment on the Tribe's authority to carry out the proposed activities. At the Regional Administrator's discretion, however, the comment period may be extended to 30 days. Comments from other governmental agencies will be limited solely to the Tribe's assertion of authority over the water resources in question. This requirement to issue notice to appropriate governmental agencies is not intended as a barrier to the Tribe's attainment of treatment as a State, but rather to resolve at an early date whether a Tribe qualifies for treatment as a State.

The Regional Administrator will evaluate the Tribe's submission to determine whether it has demonstrated that it meets the requirements of section 518(e)(2). If the Tribe establishes that it meets these requirements, the Regional Administrator may award the grant to the Tribe, assuming all other conditions have been met. The Regional Administrator may determine that a Tribe does not meet the requirements of section 518(e)(2) as to one or more specific water resources or that additional information or analysis is required to determine whether the Tribe meets the requirements of that section as to one or more such resources. In either case, if the Regional Administrator determines that the Tribe otherwise meets the requirements of section 518(e), the Regional Administrator may approve a Tribe's submission and treat the Tribe as a State with respect to the water resources for which the Tribe has met the requirements of section 518(e)(2). For any water resources included in such an approval, the Tribe is eligible for grants under 40 CFR Part 35, Subpart A and H. If any water resources are subject to a competing or conflicting claim regarding the Tribe's assertions related to section 518(e)(2), the Regional Administrator, before making a determination as to those specific water resources, will consult with the Secretary of the Interior or designee and, as appropriate, with the Tribe and any governmental entity making such a claim. The Regional Administrator's determination applies only to whether a Tribe qualifies for treatment as a State under section 518(e)(2).

#### D. Tribal Capability

The Clean Water Act also requires that a Tribe be "reasonably expected to be capable" of administering an effective program. In evaluating a Tribe's demonstration that it is reasonably capable of administering a program, the Regional Administrator may consider, but is not limited to the following factors: (1) The Tribe's previous general managerial experience; (2) existing environmental or public health programs administered by the Tribe; (3) existing or proposed staff resources and continuity of staff; (4) The Tribe's accounting and procurement systems; and (5) the mechanisms in place or available for carrying out the executive, legislative and judicial functions of the Tribal government. The Agency recognizes that many Tribes may not have experience in administering environmental programs. Although lack of this experience will not preclude a Tribe from demonstrating the required capability, the presence of such experience will be important to the Agency. The Tribe may meet the requirement by showing that it has the necessary staff or a viable plan to acquire the necessary technical and administrative expertise.

### III. Program Grants

#### A. Eligibility and Availability

The Tribe's initial application for treatment as a State ordinarily will establish whether the Tribe meets the criteria of sections 518(e) (1) and (2) for all purposes. However, a showing as to the Tribe's capability of carrying out the particular functions relating to treatment as a State for the purposes of one grant program may not provide sufficient information to permit the Agency to assess the Tribe's capability under some other program. Thus, a Tribe must apply separately for treatment as a State for each grant program; however, after a Tribe receives treatment as a State for one program, subsequent applications will ordinarily need to provide only that information which is unique to the specific additional program for which the Tribe is applying.

Section 106 grants are currently awarded to States on the basis of the number of point sources in the State versus the number of point sources in the Nation. This formula is not applicable to Indian Tribes. EPA has decided to rely initially on population as a means of allocating set-aside funds to the Regions for grant use, but this is only an initial means of getting funds to the Region. Regional Administrators may use a list of environmental criteria to determine funding of specific grant

applications. Suggested criteria include, but are not limited to: geographical significance of a Tribe's water quality problems; completed needs assessments; extent of impairment of beneficial uses; population; reservation water use; and existing environmental codes.

A Tribe which has established that it qualifies for treatment as a State may apply for funds under sections 106, 205(j)(1), 205(j)(5), 314 and 319. Because of the limited amount of funds available in any given fiscal year, the Agency may not have adequate funding to award grants to all Tribes which qualify for treatment as a State. Each year EPA will attempt to set-aside up to 3 percent of the total section 106 funds for Tribes. EPA has not set-aside funds for Tribes under sections 205(j)(1) and 205(j)(5) from the reserve of section 207 funds under section 518(c) because funds from these sources would take away funds for Tribal construction of wastewater treatment plants. Given the phase-out of Title II funding through FY 1990, and the relatively small amount of Tribal construction funds, this does not appear appropriate. The regulation does, however, provide that funds may be made available at some future date under section 207. This regulation also establishes procedures for award of section 314 funds and, if and when they become available, for section 319 funds.

#### B. Matching and Level-of-Effort Requirements

Under section 106 of the Act, States must maintain at a minimum their FY 1971 level of water pollution control expenditures. EPA is not applying the section 106 level-of-effort requirement because there is no practical way to establish FY 1971 Tribal water pollution control expenditures. Section 319(h) of the Act requires States, as a condition of receiving an implementation grant, to maintain their aggregate expenditures from all non-Federal sources for programs controlling pollution from nonpoint sources at or above the average level of such expenditures in the fiscal years 1985 and 1986. This regulation does establish such a level-of-effort requirement for section 319(h) grants to Tribes.

States are required by the CWA to match sections 319 and 205(j)(5) funds used to implement Nonpoint Source Programs. The Federal share of implementation funding is not to exceed 60 percent for 319(h) and 50 percent for 319(i). Similarly, the maximum federal share in Clean Lakes programs under section 314 is ordinarily limited to 70 percent. The Agency does not believe it is appropriate to require Tribes to meet

the same cost share requirements the Act imposes on States. Comments offered during debate on the Indian amendments to the Clean Water Act indicate that Congress recognized the difficulties that match requirements could pose for Tribes, who often lack the resources or tax infrastructure available to States for meeting cost share requirements. Reflecting that recognition, Congress expressly eliminated the cost share requirements for Title II grants for Indian Tribes. Congress did not expressly eliminate the cost share for sections 314 and 319 grants, and the Agency concludes that some cost share requirement should be retained. Consequently, based on application and demonstration by the Tribe that it does not have adequate funds, this regulation establishes an allowable maximum Federal share for such implementation grants at 90 percent of total costs. Because Indian Tribes will be able to use in-kind contributions (see 40 CFR 31.24), EPA anticipates that most Tribes will be able to meet these matching requirements.

#### C. Work Program Development

EPA requires that a Tribe submit a work program to be negotiated with the Regional Administrator. The work program must delineate each of the tasks to be undertaken, the outputs to be accomplished, funding for each task and its source, the work years devoted to each task, and a schedule of when outputs are to be completed. These requirements are the same as for any State applying for these grants and are explained further in 40 CFR Parts 31 and 35 and EPA's Performance Based Assistance Policy (May 1985).

The appropriate EPA Regional Office will oversee performance of the work program and develop a mutually agreeable evaluation plan, which at a minimum will provide for a mid-year and end-of-year review and a written evaluation provided to the Tribe. The Regional Administrator will not give a continuation award to any Indian Tribe unless the Tribe shows satisfactory progress in meeting its negotiated milestones and goals.

EPA anticipates that smaller Tribes may have difficulty administering these grant programs effectively and efficiently. Consequently, EPA encourages smaller Tribes to consider consortia or intertribal agencies as a way to obtain the necessary expertise to administer these programs. While EPA encourages applications by groups or consortia of small Tribes within the same geographical area, each application, regardless of the applicant's

size, will be evaluated on a case-by-case basis.

Tribes that qualify for treatment as States should apply for financial assistance under section 106 prior to the start of each fiscal year (October 1) consistent with EPA Regional Office schedules. Funds not specifically obligated to Indian Tribes by July 1 of each fiscal year, beginning in FY 1990, will be reallocated to Tribes currently receiving a program grant or currently eligible to receive a grant.

*D. FY 1988 and FY 1989 Funding*

For FY 1988, Congress appropriated \$60,850,000 for section 106, and 1 1/2 percent of the appropriated section 106 funding (\$913,000) has been set-aside for Tribes. In FY 1989, 1 1/2 percent of the section 106 appropriation, or \$1,006,500, has been set-aside for Indians.

Because of the late promulgation of this rule, the FY 1988 and FY 1989 set-asides for Indian Tribes will not be reallocated. These funds will remain available in FY 1989 and FY 1990, respectively, for Tribes and will not be used for other purposes.

**IV. Program Requirements**

Section 106 of the Act requires States to carry out appropriate devices, methods, systems and procedures necessary to monitor and to compile and analyze data on the quality of navigable waters, and to the extent practicable, ground water (including biological monitoring). It also provides for updating annually such data and including it in the report required under section 305 of the Act. We are not requiring Tribes to establish and operate a reservation-wide monitoring program for chemical, physical, biological and ground water monitoring or complete the report required under section 305(b) of the Act. However, any monitoring and/or analysis activities undertaken by a Tribe must be performed in accordance with EPA's quality assurance/quality control guidelines. Indian Tribe work programs under section 106 must show how quality assurance guidelines will be met and maintained throughout the period of any project requiring environmental measurements, assessments or monitoring. Whenever a project performed by a Tribe provides updated data on water quality, the Tribe is required to provide a summary of such information to EPA.

Section 106(e) of the Act requires a State, as a condition of receiving a section 106 grant, to have authority comparable to the Administrator's emergency powers under section 504 of the Act to restrain the discharge of

pollutants presenting imminent and substantial endangerment to the health or welfare of persons. Section 106(e) also requires a State to have adequate contingency plans to implement such authority. The regulation applies this requirement to Tribes by requiring a demonstration of the necessary authority and contingency plans prior to award of a grant.

**V. Request for Public Comments**

EPA requests public comments and information on all aspects of this interim final regulation.

**VI. Impact Analyses**

*A. Regulatory Impact Analysis*

Executive Order No. 12291 requires that a regulatory agency determine whether a new regulation will be "major" and, if so, that a regulatory impact analysis be conducted. A major rule is defined as a regulation which is likely to result in: (1) An annual adverse effect on the economy of \$100 million or more; (2) a major increase in costs or prices for consumers; individual industries; Federal, State, and local government agencies, or geographic regions; or (3) significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Because the rule does not meet the definition of major regulation, the Agency is not conducting a regulatory impact analysis.

*B. Paperwork Reduction Act*

The Office of Management and Budget has approved the information collection requirements contained in this rule under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and has assigned OMB control number 2030-0020.

**List of Subjects**

*40 CFR Part 35*

Air pollution control, Grant programs—environmental protection, Indians pesticides and pests, Reporting and record-keeping requirements, Waste treatment and disposal, Water pollution control.

*40 CFR Part 130*

Water pollution control, Environmental protection.

**William K. Reilly,**  
*Administrator.*

Date: April 3, 1989.

For the reasons set forth in the preamble, EPA is amending 40 CFR Parts 35 and 130 as set forth below.

**PART 35—STATE AND LOCAL ASSISTANCE**

1. The authority citation for Part 35, Subpart A is revised to read as follows:

**Authority:** Secs. 105 and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7405 and 7601(a)); secs. 106, 205(g), 205(j), 208, 319, 501(a), and 518 of the Clean Water Act, as amended (33 U.S.C. 1256, 1285(g), 1285(j), 1288, 1361(a) and 1377); secs. 1443, 1450, and 1451 of the Safe Drinking Water Act (42 U.S.C. 300j-2 and 300j-9); secs. 2002(a) and 3011 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6912(a), 6931, 6947, and 6949); and secs. 4, 23, and 25(a) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136(b), 136(u), and 136w(a)).

2. Section 35.105 is amended to add in alphabetical order new definitions for "Indian Tribes" and "Federal Indian reservations" and a revised definition of a "State" to read as follows:

**§ 35.105 Definitions.**

\* \* \* \* \*

"Federal Indian reservation" means for purposes of Clean Water Act, all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation.

\* \* \* \* \*

"Indian Tribe" means for purposes of the Clean Water Act, any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian reservation.

\* \* \* \* \*

"State" means within the context of Public Water Systems Supervision and Underground Water Source Protection grants or of financial assistance programs under the Clean Water Act, one of the States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territories of the Pacific Islands or an Indian Tribe treated as a State.

\* \* \* \* \*

3. Section 35.115 is amended by revising paragraphs (b) and (d), and redesignating paragraphs (e) through (i) as (g) through (k), and adding new paragraphs (e) and (f) to read as follows:

**§ 35.115 State allotments and reserves.**

(b) *Water pollution control allotment including ground-water protection allotments* (Clean Water Act, section 106): The extent of the State's water pollution problem. In each fiscal year, the Administrator will reserve a percentage of the total available funds for Indian Tribes treated as States.

(d) *Water quality management planning reserve* (Clean Water Act, section 205(j)(1)): Not less than \$100,000 nor more than one percent of the State's construction grant allotment as determined by Congress. However, for Guam, the Virgin Islands, American Samoa, the Trust Territories of the Pacific Islands and the Northern Mariana Islands, a reasonable amount shall be reserved for this purpose. Each fiscal year the Administrator may reserve a percentage of the sums appropriated under section 207 for water quality management planning assistance to Indian Tribes treated as States.

(e) *Nonpoint Source Management Reserve* (Clean Water Act, sections 205(j)(5) and 319(h)): Each fiscal year the Administrator may reserve for Indian Tribes treated as States one-third of one percent of the amount appropriated under section 319(j) for 319(h) & (i). Each fiscal year the Administrator may also reserve under section 205(j)(5) a percentage of the sums appropriated under section 207 to assist Indian Tribes treated as States to carry out section 319(h).

(f) *Ground-water Quality Protection Reserve* (Clean Water Act, section 319(i)): Each fiscal year the Administrator may reserve for Indian Tribes treated as States one-third of one percent of the amount appropriated under section 319(j) for 319(h) & (i).

4. Section 35.155 is amended to add after the words "construction activities;" the phrase, "except as provided in paragraph (c) of this section," and to add a new paragraph (c) to read as follows:

**§ 35.155 Reallocation**

(c) Beginning in FY 1990, on July 1 of each fiscal year, funds reserved under sections 106, 205(j)(1), 205(j)(5), and 319 of the Clean Water Act for Indian Tribes treated as States, which have not been awarded by the Regional Administrator, shall be reallocated nationally by the Administrator for awards to other Indian Tribes treated as States. Section 319 and 205(j)(5) funds awarded to an Indian Tribe treated as a State in a

fiscal year which are not obligated by the end of the fiscal year shall be available to the Administrator for reallocation to other such Tribes in the following fiscal year.

5. The first sentence of § 35.250 is revised to read as follows:

**§ 35.250 Purpose.**

Sections 106 and 518 of the Clean Water Act authorize assistance to State and interstate agencies (as defined in section 502 of the Act) and to Indian Tribes treated as States to administer programs for the prevention, reduction, and elimination of water pollution, including programs for the development and implementation of ground-water protection strategies. \* \* \*

6. Section 35.255 is revised to read as follows:

**§ 35.255 Maintenance of effort.**

(a) To receive funds under section 106, any State or interstate agency must expend annually for recurrent section 106 program expenditures an amount of non-Federal funds at least equal to expenditures during the fiscal year ending June 30, 1971.

(b) The maintenance of effort requirement in paragraph (a) of this section shall not apply to Indian Tribes treated as States.

7. Section 35.260 is amended by adding the following sentence at the end of paragraph (a) and by revising paragraph (b) to read as follows:

**§ 35.260 Limitations.**

(a) \* \* \* The Regional Administrator may award section 106 funds to Indian Tribes treated as States even if they do not meet this requirement. However, all monitoring and analysis activities performed by a Tribe must meet the applicable quality assurance, quality control requirements as specified in 40 CFR Part 31.

(b) The Regional Administrator will not award section 106 funds to any State, including any Indian Tribe treated as a State, which does not have authority comparable to that in section 504 of the Clean Water Act and adequate contingency plans to implement such authority.

8. Part 35, Subpart A is amended by adding a new § 35.265 to read as follows:

**§ 35.265 Awards to Indian Tribes.**

(a) The Regional Administrator will not award section 106 funds to an Indian Tribe unless EPA has determined that the Indian Tribe meets the requirements for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15 as well

as the applicable limitations in 40 CFR 35.260.

(b) The Regional Administrator will not give a continuation award to any Indian Tribe unless the Tribe shows satisfactory progress in meeting its negotiated milestones and goals.

9. The centered subheading at the end of § 35.310 is revised to read as follows:

**§ 35.310 Limitations****Water Quality Management Planning (Section 205(j)(2))**

10. The first sentence of § 35.350 is revised to read as follows:

**§ 35.350 Purpose.**

Sections 205(j)(2) and 518 of the Clean Water Act authorize assistance to States (as defined in section 502 of the Act) and to Indian Tribes treated as States to carry out water quality management planning activities. \* \* \*

**§ 35.360 [Amended]**

11. Revise the references to "205(j)" in § 35.360 (a), (b) and (c) to read "205(j)(1)."

12. Add a new § 35.365 to read as follows:

**§ 35.365 Awards to Indian Tribes.**

(a)(1) The Regional Administrator will not award section 205(j)(1) funds to an Indian Tribe unless the Tribe meets the requirements for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15, as well as the applicable limitations in 40 CFR 35.360.

(b) The Regional Administrator will not give a continuation award to any Indian Tribe unless the Tribe shows satisfactory progress in meeting its negotiated milestones and goals.

13. Add a new centered subheading to the end of § 35.605 to read as follows:

**§ 35.605 Maximum Federal share.****Nonprofit Source Management (Sections 205(j)(5) and 319(h))**

14. Add a new § 35.750 to read as follows:

**§ 35.750 Purpose.**

Sections 319 and 518 of the Clean Water Act authorize nonpoint source management assistance to States, including Indian Tribes treated as States. Under section 319(h), grants may be awarded for the development of nonpoint source management programs, using funds reserved under section 205(j)(5) of the Act, and for the implementation of EPA-approved



management programs using funds reserved under section 205(j)(5) or funds appropriated under section 319. Under section 319(i), grants may be awarded to carry out ground-water quality protection activities that will advance the implementation of a comprehensive approved nonpoint source management program.

15. Add a new § 35.755 to read as follows:

**§ 35.755 Awards to Indian Tribes.**

(a) No grants for the development of an approved nonpoint source management program will be awarded to an Indian Tribe unless the Regional Administrator determines that the Tribe meets the requirements for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15.

(b) No funds for the implementation of an approved nonpoint source management program will be awarded to an Indian Tribe unless:

(1) The Regional Administrator determines that the Indian Tribe meets the requirements for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15; and

(2) The Tribe agrees to:

(i) Maintain its aggregate expenditures from all other sources for programs controlling pollution from nonpoint sources and improving the quality of navigable waters within the Tribe's jurisdiction at or above the average levels of such expenditures in the fiscal years 1985 and 1986;

(ii) Limit administrative costs for services provided and charged against activities and programs carried out with a grant under section 319(h) to no more than 10 percent of the amount of the grant in any year, except that costs of implementing enforcement and regulatory activities, education, training, technical assistance, demonstration projects, and technology transfer programs are not subject to this limitation; and

(iii) Provide a matching share in accordance with 40 CFR 35.760;

(iv) Use such funds for financial assistance to persons only to the extent that such assistance is related to the costs of demonstration projects.

(v) Report to the Administrator on an annual basis concerning (A) its progress in meeting the schedule of milestones submitted under section 319(b)(2)(C) of the Act and (B) to the extent that appropriate information is available, reductions in nonpoint source pollutant loading and improvements in water quality for those navigable waters or watersheds within the jurisdiction of the Tribe which were identified under section 319(a)(1)(A) of the Act resulting

from implementation of the management program.

(c) No funds to carry out ground-water protection activities under section 319(i) of the Act will be awarded to an Indian Tribe unless:

(1) The Regional Administrator determines that the Tribe meets the requirements for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15; and

(2) The Tribe agrees to provide a matching share in accordance with 40 CFR 35.760.

(d) The Regional Administrator will not give a nonpoint source management continuation award to any Indian Tribe unless the Tribe shows satisfactory progress in meeting its negotiated milestones and goals.

16. Add a new § 35.760 to read as follows:

**§ 35.760 Maximum Federal share.**

(a) The Regional Administrator may provide up to 100 percent of approved work program costs for the development of a nonpoint source management program.

(b) Except as provided in paragraph (c) or (d) of this section, the Regional Administrator may provide to an Indian Tribe up to 60 percent of approved nonpoint source management implementation program costs, and 50 percent of approved ground-water protection program costs, on condition that the non-Federal share is provided from non-Federal sources.

(c) The Regional Administrator may increase the maximum Federal shares upon application and demonstration by the Tribe that it does not have adequate funds (including Federal funds authorized by statute to be used for matching purposes, tribal funds or in-kind contributions) to meet the required match. In no case shall the Federal share be greater than 90 percent.

(d) In any fiscal year, the amount of assistance awarded under section 319 of the Act to any one Indian Tribe treated as a State shall not exceed 15 percent of the section 319(h) reserve for Tribes established under § 35.115(e).

(e) In any fiscal year the amount of assistance awarded to any one Indian Tribe treated as a State under section 319(i), from funds appropriated under section 319(j), shall not exceed \$150,000.

17. The authority citation for Part 35, Subpart H is revised to read as follows:

**Authority:** Sections 314, 501 and 518, Clean Water Act (86 Stat. 816, 33 U.S.C. 1251 *et seq.*).

**§ 35.1600 [Amended]**

18. Section 35.1600 is amended by changing "Part 30" to "Part 31" and

inserting "and Indian Tribes treated as States" after the word "States."

**§ 35.1605 [Amended]**

19. Section 35.1605 is amended by changing "section" to "sections" and adding "and 518(h)" after "502."

20. Add a new § 35.1605-9 to read as follows:

**§ 35.1605-9 Indian Tribe treated as a State.**

A Tribe meeting the requirements set forth for treatment as a State in accordance with 40 CFR 130.6(d) and 130.15.

21. Section 35.1620-1 is amended by adding a new paragraph (c) to read as follows:

**§ 35.1620-1 Types of assistance.**

\* \* \* \* \*

(c) *Indian Tribes treated as States.* In either phase, the Regional Administrator may increase the 50 and 70 percent maximum Federal share for an Indian Tribe treated as a State based upon application and demonstration by the Tribe that it does not have adequate funds (including Federal funds authorized by statute to be used for matching purposes, tribal funds or in-kind contributions to meet the required match). In no case shall the Federal share be greater than 90 percent.

**PART 130—WATER QUALITY PLANNING AND MANAGEMENT**

22. The authority citation for Part 130 continues to read as follows:

**Authority:** 33 U.S.C. 1251 *et seq.*

**§ 130.1 [Amended]**

23. Section 130.1 is amended by inserting "Indian Tribe treated as a State," after "State,".

24. In § 130.2, paragraphs (b) through (m) are redesignated as paragraphs (c) through (n) and a new paragraph (b) is added to read as follows:

**§ 130.2 Definitions.**

\* \* \* \* \*

(b) *Indian Tribe.* Any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian reservation.

\* \* \* \* \*

25. Section 130.4(a) is amended by adding the following sentence to the end of paragraph (a).

**§ 130.4 Water quality monitoring.**

(a) \* \* \*

This requirement need not be met by Indian Tribes. However, any monitoring and/or analysis activities undertaken by

a Tribe must be performed in accordance with EPA's quality assurance/quality control guidance.

26. Section 130.6 is amended by revising paragraph (d) to read as follows:

**§ 130.6 Water quality management plans.**

(d) *Indian Tribes.* An Indian Tribe may be treated as a State for the purposes of this rule and the Clean Water Act assistance programs under 40 CFR Part 35, Subparts A and H if:

(1) The Indian Tribe has a governing body carrying out substantial governmental duties and powers;

(2) The functions to be exercised by the Indian Tribe pertain to the management and protection of water resources which are held by an Indian Tribe, held by the United States in trust for Indians, held by a member of an Indian Tribe if such property interest is subject to a trust restriction on alienation, or otherwise within the borders of an Indian reservation; and

(3) The Indian Tribe is reasonably expected to be capable, in the Regional Administrator's judgment, of carrying out the functions to be exercised in a manner consistent with the terms and purposes of the Clean Water Act and applicable regulations.

27. Add a new § 130.15 to read as follows:

**§ 130.15 Processing application for treatment as a State.**

(a) The Regional Administrator shall process an application of an Indian Tribe for treatment as a State submitted under § 130.6(d) in a timely manner. He shall promptly notify the Indian Tribe of receipt of the application.

(b) Within 15 days after receipt of the Indian Tribe's complete application for treatment as a State, the Regional Administrator shall issue notice to all appropriate governmental entities. Notice shall include information on the substance of and basis for the Tribe's assertion related to § 130.6(d)(2).

(c) Each governmental entity so notified by the Regional Administrator shall have 15 days to comment, except that the Regional Administrator is authorized to provide for a 30-day comment period. Comments by governmental entities shall be limited to

the Tribe's assertion related to § 130.6(d)(2).

(d) If any water resources are subject to a competing or conflicting claim regarding the Tribe's assertions related to 130.6(d)(2), the Regional Administrator shall, prior to making his determination, consult with the Secretary of the Interior or his designee and, as appropriate, with the Tribe and any governmental entity making such a claim.

[FR Doc. 89-8509 Filed 4-10-89; 8:45 am]

BILLING CODE 6560-50-M

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Part 642**

[Docket No. 81126-8226]

**Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic**

**AGENCY:** National Marine Fisheries Service (NMFS), NOAA, Commerce.

**ACTION:** Notice of closure.

**SUMMARY:** The Secretary of Commerce (Secretary) closes the commercial fishery in the exclusive economic zone (EEZ) for Spanish mackerel from the Gulf migratory group. The Secretary has determined that the commercial allocation for Spanish mackerel from the Gulf migratory group was reached on April 6, 1989. This closure is necessary to protect the Gulf Spanish mackerel resource.

**EFFECTIVE DATE:** Closure is effective at 12:01 a.m., local time, April 7, 1989, until 12:00 p.m. (midnight), local time, June 30, 1989.

**FOR FURTHER INFORMATION CONTACT:** Mark F. Godcharles, (813) 893-3722.

**SUPPLEMENTARY INFORMATION:** The Fishery Management Plan for Coastal Migratory Pelagic Resources of the Gulf of Mexico and the South Atlantic, as amended, was developed by the South Atlantic and Gulf of Mexico Fishery Management Councils (Councils) under authority of the Magnuson Fishery Conservation and Management Act, and is implemented by regulations at 50 CFR Part 642. Regulations effective July 1, 1988, implemented catch limits recommended by the Councils for the

Gulf migratory group of Spanish mackerel for the current fishing year (July 1, 1988, through June 30, 1989). Those regulations set the commercial allocation at 2.85 million pounds (53 FR 25611, July 8, 1988).

Under § 642.22(a), the Secretary is required to close any segment of the Spanish mackerel commercial fishery when its allocation has been reached, or is projected to be reached, by publishing a notice in the *Federal Register*. The Secretary has determined that the commercial allocation for the Gulf migratory group of Spanish mackerel was reached on April 6, 1989. Hence, the commercial fishery for Spanish mackerel from the Gulf migratory group is closed effective 12:01 a.m., April 7, 1989, through June 30, 1989 the end of the fishing year. This closure applies in the EEZ from the Mexico/United States border east and north to a line extending directly east from the Dade/Monroe County, Florida, boundary (25°20.4'N. latitude).

Except for a person on a charter vessel, during the closure, no person aboard a vessel permitted to fish under a commercial allocation may fish for, retain, or have in possession in the EEZ Gulf group Spanish mackerel. A person aboard a charter vessel may continue to fish for Gulf group Spanish mackerel under the bag limit set forth in § 642.28(a)(3), provided the vessel is under charter. During the closure, Gulf group Spanish mackerel taken in the EEZ, including those harvested under the bag limit, may not be purchased, bartered, traded, or sold. The latter prohibition does not apply to trade in Gulf group Spanish mackerel harvested, landed, and bartered, traded or sold prior to the closure and held in cold storage by a dealer or processor

**Other Matters**

This action is required by 50 CFR 642.22(a) and complies with E.O. 12291.

Authority: 16 U.S.C. 1801 *et seq.*

**List of Subjects in 50 CFR Part 642**

Fisheries, Fishing.

**Alan Dean Parsons,**  
*Acting Director, Office of Fisheries Conservation and Management, National Marine Fisheries Service.*

[FR Doc. 89-8517 Filed 4-6-89; 1:26 pm]

BILLING CODE 3510-22-M

# Proposed Rules

Federal Register

Vol. 54, No. 68

Tuesday, April 11, 1989

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

## GENERAL ACCOUNTING OFFICE

### 4 CFR Part 21

#### General Accounting Office Bid Protest Regulations

**AGENCY:** General Accounting Office.

**ACTION:** Advance notice of proposed rulemaking.

**SUMMARY:** The General Accounting Office is reviewing the regulations governing its bid protest process (4 CFR Part 21) and solicits comments on how those regulations could be amended to improve the effectiveness of the process.

**DATE:** The General Accounting Office will consider comments received before June 1, 1989.

**ADDRESS:** Send comments to U.S. General Accounting Office, Office of General Counsel, 441 G Street, NW., Washington, DC 20548.

**FOR FURTHER INFORMATION CONTACT:** John Brosnan, Assistant General Counsel, General Accounting Office, by telephone (202) 275-9740.

**SUPPLEMENTARY INFORMATION:** In December 1987 the General Accounting Office (GAO) published a final rule amending the regulations under which GAO considers protests of government procurement actions pursuant to the Competition in Contracting Act, 31 U.S.C. 3551-3556 (52 FR 46445, December 12, 1987). In connection with the promulgation of this rule, GAO announced that after 1 year, it would review the operation of its bid protest process under the amendments. GAO is now undertaking that review and anticipates that its review will result in one or more proposals to amend the regulations which will be the subject of proposed rulemaking at a later date.

GAO invites public participation in this review and solicits public comments on both the 1987 amendments and the bid protest regulations generally.

The 1987 amendments included two significant changes in the regulations. The first change concerns the release of

agency documents to a protester or another interested party involved in a protest. 31 U.S.C. 3553(f) requires that a contracting agency furnish a protester all documents relevant to the protest which will not give the protester a competitive advantage and that the protester is otherwise authorized by law to receive. Under the amendment, GAO has undertaken to decide whether withheld agency documents requested by a protesting party should be released in order to assure that the protester is receiving all the documents to which it is entitled.

The second significant change provides for a formal fact finding hearing before a GAO hearing official when a protest involves a factual dispute which must be resolved before a decision can be made on the protest. The hearing is on the record and witnesses testify under oath. The proceeding then becomes the basis for fact finding which is included in the ultimate decision on the protest.

GAO is interested in comments on the extent to which these amendments have improved the effectiveness of GAO's bid protest process and the impact the amendments have had on the time and resources required to adequately represent the interest of a protester or an agency in a bid protest.

GAO is also interested in suggestions for other improvements in the bid protest process. For example, GAO invites comments on whether it is possible or desirable to give protesters greater access to proprietary and other competition sensitive data in the hands of an agency through a mechanism that would protect against improper disclosure or use of that information. Similarly, GAO invites comments on how the informal and fact finding conferences that are part of the current bid protest process could be modified so that they make a better contribution to the proper resolution of protests and the extent to which this can be accomplished without sacrificing the relatively uncomplicated and inexpensive nature of GAO's bid protest procedures. More generally, GAO invites any suggestions for modification of the regulations that will improve its bid protest process as a means for resolving disputes between government

agencies and those seeking contracts with them.

**Charles A. Bowker,**

*Comptroller General of the United States.*

[FR Doc. 89-8473 Filed 4-10-89; 8:45 am]

BILLING CODE 1610-01-M

## DEPARTMENT OF THE INTERIOR

### Bureau of Indian Affairs

#### 25 CFR Parts 101 and 103

#### Loans to Indians From the Revolving Loan Fund and Loan Guaranty, Insurance, and Interest Subsidy

August 8, 1988.

**AGENCY:** Bureau of Indian Affairs, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** The Indian Financing Act Amendments of 1984 amended the Indian Financing Act of 1974 by removing a restriction precluding individual Indians who are members of tribes having credit programs from receiving direct loans or loan guarantees from the Bureau of Indian Affairs; allowing the Secretary to cancel loan payment obligations without Congressional approval; increasing the guaranteed loan limitation for individuals from \$100,000 to \$350,000; authorizing annual appropriations to cover losses on guaranteed or insured loans, and making interest payments on such loans. These legislative amendments are the basis for amending Subchapter C, Parts 101 and 103, of the Code of Federal Regulations, which are set out below.

**DATE:** Comments must be received on or before May 11, 1989.

**ADDRESSES:** Send written comments to Deputy to the Assistant Secretary—Indian Affairs (Trust and Economic Development), Attention: Division of Financial Assistance, Room 4062 MIB, Bureau of Indian Affairs, Department of the Interior, 18th and C Streets NW., Washington, DC 20240.

**FOR FURTHER INFORMATION CONTACT:** Richard K. Nephew, Division of Financial Assistance, Bureau of Indian Affairs, telephone number (202) 343-3660.

**SUPPLEMENTARY INFORMATION:** These amendments are published in exercise

of authority delegated by the Secretary of the Interior to the Assistant Secretary—Indian Affairs by 209 DM 8. The policy of the Department of the Interior is, whenever practical, to afford the public an opportunity to participate in the rulemaking process. Accordingly, interested persons may submit written comments regarding the proposed rule to the locations identified in the "ADDRESS" section of this preamble.

The proposed amendments reflect changes in the Indian Financing Act of 1974 which expand financing opportunities to individual Indians for participation in the development of Indian economies.

Prior to the passage of the Indian Financing Act Amendments of 1984, individual Indians who were members of tribes having relending programs were ineligible to receive guaranteed or direct loans from the Bureau. Guaranteed loans to other eligible individuals were limited by the Act to \$100,000, and direct loans were administratively held to the same level. Since the limit for a guaranteed loan to an individual has been raised to \$350,000 and eligibility expanded, use of the program is expected to increase. Direct loans for individuals are not limited by the Act or Amendments and those too are being set at a \$350,000 limit for individuals in the proposed rule. The minimum limit of \$10,000 on guaranteed loans, along with the minimum time limit of one year, are proposed for removal because they are unnecessary.

Other legislative amendments removed the Leavitt Act (47 Stat. 564, 25 U.S.C. 386a) restriction on reporting cancellations to Congress before they became effective. This allows cancellations to be considered at any time and eliminates the waiting period after the Secretary has signed the cancellation order.

Another change adds the requirement that all guaranteed loans shall be reviewed by the Bureau, independent of the lending institution.

The proposed rule also provides that loans with variable interest rates may be guaranteed.

The Department of the Interior has determined that this document is not a major action under E.O. 12291 and certifies that this document will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*).

It is estimated the program regulated by this part will have no more than a \$50 million gross annual effect on the national economy. It is then, by definition at 318 DM 5, not a major

action. Since this document does not constitute a major Federal action significantly affecting the quality of the human environment under the National Environmental Policy Act of 1969, no environmental assessments were made.

The collections of information contained in this rule have been submitted to the Office of Management and Budget for approval as required by 44 U.S.C. 3501 *et seq.* The collection of this information will not be required until it has been approved by the Office of Management and Budget.

Public reporting burden for this collection of information is estimated to vary from 15 minutes to 3 hours per response, with an average of one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Information Collection Clearance Officer, Bureau of Indian Affairs, Mailstop 337-SIB, 18th and C Streets, NW., Washington, DC 20240; and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

The primary authors of this document are Richard K. Nephew and Woodrow Sneed, Division of Financial Assistance, Bureau of Indian Affairs, telephone number (202) 343-3660.

#### List of Subjects

##### 25 CFR Part 101

Indians—business and finance, Loan programs—Indians, Reporting and recordkeeping requirements.

##### 25 CFR Part 103

Indians—business and finance, Loan programs—business, Loan programs—Indians.

For the reasons set out in the Preamble, Parts 101 and 103 of Title 25, Chapter I of the Federal Regulations are proposed to be amended as set forth below.

#### PART 101—[AMENDED]

1. The authority citation for Part 101 is revised to read as follows:

Authority: 25 U.S.C. 1469.

2. Section 101.2 is amended by revising the introductory text of paragraph (b) as follows:

##### § 101.2 Kinds of loans.

\* \* \* \* \*

(b) Direct loans may be made by the United States to eligible tribes, tribal organizations or corporations and tribal cooperative associations without fund restrictions. Direct loans to individual Indians, partnerships, and other non-tribal organizations shall not exceed \$350,000. Direct loans from the United States shall be made for the following purposes:

\* \* \* \* \*

3. Section 101.3 is amended by revising paragraph (a) as follows:

##### § 101.3 Eligible borrowers under United States direct loan program.

(a) Loans may be made from the revolving loan fund to Indians, eligible tribes and relending organizations, and corporations, cooperative associations and partnerships having a form of organization satisfactory to the Commissioner. Loans may be made to applicants only when, in the judgment of the Commissioner, there is a reasonable prospect of repayment. Loans may be made only to an applicant who, in the opinion of the Commissioner, is unable to obtain financing on reasonable terms and conditions from other sources such as tribal relending programs, banks, Farmers Home Administration, Small Business Administration, Production Credit Associations, or Federal Land Banks, and is also unable to obtain a guaranteed or insured loan pursuant to Title II of the Indian Financing Act of 1974 (88 Stat. 77).

\* \* \* \* \*

4. Section 101.7 is amended by revising the first sentence of the introductory paragraph to read as follows:

##### § 101.7 Management and technical assistance.

Prior to and concurrent with the approval of a United States direct loan to finance an economic enterprise, the Commissioner will assure under Title V of the Indian Financing Act of 1974 that competent management and technical assistance is available to the loan applicant for preparation of the application and/or administration of funds loaned consistent with the nature of the enterprise proposed to be or in fact funded by the loan. \* \* \*

5. Section 101.17 is revised to read as follows:

##### § 101.17 Uncollectible loans made by the United States.

If the Secretary determines that a United States direct loan is uncollectable in whole or in part or is collectable only at an unreasonable cost, or when such action would be in

the best interest of the United States, the Secretary may cancel, adjust, compromise, or reduce the amount of any loan made from the revolving loan fund. The Commissioner may adjust, compromise, subordinate, or modify the terms of any mortgage, lease, assignment, contract, agreement, or other document taken as security for loans. The cancellation of all or part of a loan shall become effective when signed by the Secretary.

6. A new § 101.26 is added to read as follows:

**§ 101.26 Information collection.**

(a) The collection of information contained in §§ 101.3, 101.4, 101.12, and 101.25 have been approved by the Office of Management and Budget under 44 U.S.C. 3501 *et seq.* and assigned clearance number 1076-0020. The information will be used to rate applicants in accordance with the terms and conditions set forth in section 103 of the Indian Financing Act, as amended. Response is required to obtain a benefit in accordance with 25 U.S.C. 1451.

(b) Public reporting burden for this information is estimated to vary from 15 minutes to 3 hours per response, with an average of one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspects of this collection of information, including suggestions for reducing the burden, to the Information Collection Clearance Office, Bureau of Indian Affairs, Mailstop 337-SIB, 18th and C Streets NW., Washington, DC 20240; and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

7. The authority citation for Part 103 is revised to read as follows:

Authority: 25 U.S.C. 1498.

8. Section 103.4 is amended by revising the first sentence in paragraph (a) to read as follows:

**§ 103.4 Management and technical assistance.**

(a) Prior to and concurrent with the issuance of a guaranty certificate for a loan to finance an economic enterprise, the Commissioner will assure under Title V of the Indian Financing Act that

competent management and technical assistance is available for preparation of the application and/or administration of funds granted consistent with the nature of the enterprise proposed to be or that is in fact funded. \* \* \*

\* \* \* \* \*

9. Section 103.8 is revised to read as follows:

**§ 103.8 Eligible individuals.**

Indians who are members of tribes recognized by the federal government as eligible for services from the Bureau of Indian Affairs are eligible for guaranteed or insured loans. Individuals applying for a guaranteed or insured loan to purchase, establish or operate an economic enterprise on a reservation must comply with the requirements of applicable rules, resolutions or ordinances enacted by the governing body of the tribe.

10. Section 103.13 is amended by revising paragraph (a) to read as follows:

**§ 103.13 Amount of guaranty.**

(a) The percentage of a loan that is guaranteed shall be the minimum necessary to obtain financing for an applicant, but may not exceed 90 percent of the unpaid principal and interest. The liability under the guaranty shall increase or decrease pro rata with any increase or decrease in the unpaid portion of the principal amount of the obligation. No loan to an individual Indian may be guaranteed for an unpaid principal amount in excess of \$350,000.

\* \* \* \* \*

11. A new § 103.55 is added to read as follows:

**§ 103.55 Information collections.**

(a) The collection of information contained in § 103.15 has been approved by the Office of Management and Budget under 44 U.S.C. 3501 *et seq.* and assigned clearance number 1076-0020. The information will be used to rate applicants in accordance with the terms and conditions set forth in §§ 103.4, 103.9, 103.15, 103.36, 103.37, 103.42, 103.43, and 103.52 have been approved by the Office of Management and Budget under 44 U.S.C. 3501 *et seq.* and assigned clearance number 1076-0020. The information will be used to rate applicants in accordance with the terms and conditions set forth in section 103 of the Indian Financing Act, as amended. Response is required to obtain a benefit in accordance with 25 U.S.C. 1451.

(b) Public reporting burden for this

information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspects of this collection of information, including suggestions for reducing the burden, to the Information Collection Clearance Officer, Bureau of Indian Affairs, Mailstop 337-SIB, 18th and C Streets NW., Washington, DC 20240; and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

**§ 103.15 [Amended]**

12. Section 103.15, Application for loans, is amended by removing the last sentence in paragraph (b)(2) and by adding a new paragraph (c) to read as follows:

\* \* \* \* \*

(c) The Commissioner will review applications for guaranteed loans individually and independently from the lending institution.

13. Section 103.39 is revised to read as follows:

**§ 103.39 Cancellation.**

The Secretary may cancel the uncollectable portion of any obligation assigned to the United States or rights to which the United States is subrogated and the security assigned to the United States.

**§ 103.41 [Amended]**

14. Section 103.41, Interest, is amended by removing the next to the last sentence and replacing it with the following sentence: \* \* \* Once a loan is closed the interest rate may not be increased except when a variable interest rate tied to a specified base rate agreed upon by the borrower and the lender has been approved by the Commissioner. \* \* \*

W.P. Ragsdale,  
*Acting Assistant Secretary, Indian Affairs.*

**Editorial note:** This document was received at the Office of the Federal Register on April 6, 1989.

[FR Doc. 89-8483 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-02-M

## DEPARTMENT OF THE TREASURY

## Internal Revenue Service

## 26 CFR Part 31

[IA-104-88]

**Imposition of Backup Withholding Due To Notification of an Incorrect Taxpayer Identification Number and the Due Diligence Exception to the Imposition of a Penalty for a Missing or an Incorrect Taxpayer Identification Number**

**AGENCY:** Internal Revenue Service, Treasury.

**ACTION:** Notice of proposed rulemaking by cross-reference to temporary regulations.

**SUMMARY:** In the Rules and Regulations portion of this issue of the *Federal Register*, the Internal Revenue Service is issuing temporary regulations that would amend and clarify the rules concerning the requirement for payors to backup withhold and the actions that payors must take to exercise due diligence with respect to a missing or an incorrect taxpayer identification number due to notification of an incorrect taxpayer identification number. The text of the temporary regulations also serves as the comment document for this notice of proposed rulemaking.

**DATES:** The regulations are proposed to be effective for reportable payments made after December 31, 1983, and to information returns filed after December 31, 1984. However, the requirements of § 35a.3406-1 are proposed to be effective on and after January 1, 1989. Written comments and requests for a public hearing must be delivered or mailed by June 12, 1989.

**ADDRESS:** Send comments and requests for a public hearing to: Internal Revenue Service, P.O. Box 7604, Ben Franklin Station, Attn: CC:CORP:TR (IA-104-88), Washington, DC 20044.

**FOR FURTHER INFORMATION CONTACT:** Renay France at (202) 566-3627 (not a toll-free number).

**SUPPLEMENTARY INFORMATION:****Background**

The temporary regulations published in the Rules and Regulations portion of this issue of the *Federal Register* amend the rules set forth in § 35a.3406-1 and §§ 35a.9999-1 and 35a.9999-3 in order to conform those rules to the changes made by Notice 88-77, 1988-28 I.R.B. 26, and Notice 88-89, 1988-34 I.R.B. 22. Further, the temporary regulations would provide a new due diligence standard for payors of certain accounts with post-1987 awaiting-TIN certifications, for payors of beneficiaries

under life-insurance contracts, and for payors of certain payees who are exempt from the payment of the tax on self-employment income under Code section 1401 or the Federal Insurance Contributions Act tax on employers or employees under Code section 3111 or 3101, respectively. For the text of the new temporary regulations, see T.D 8248 published in the Rules and Regulations portion of this issue of the *Federal Register*. The preamble to the temporary regulations explains the regulations.

**Special Analyses**

These proposed rules are not major rules as defined in Executive Order 12291. Therefore, a Regulatory Impact Analysis is not required. Although this document is a notice of proposed rulemaking that solicits public comments, the notice and public procedure requirements of 5 U.S.C. 553 do not apply because the regulations proposed herein are interpretative. Therefore, an initial Regulatory Flexibility Analysis is not required by the Regulatory Flexibility Act (5 U.S.C. Chapter 6).

**Comments and Requests for a Public Hearing**

Before adopting these proposed regulations, consideration will be given to any written comments that are submitted (preferably a signed copy and seven copies) to the Internal Revenue Service. All comments will be available for public inspection and copying in their entirety. A public hearing will be scheduled and held upon written request by any person who submits written comments on the proposed rules. Also, the Internal Revenue Service intends to publish a notice of proposed rulemaking in the near future that will provide comprehensive rules on backup withholding. Generally, the pertinent provisions of all the temporary regulations with respect to backup withholding will be incorporated in the notice of proposed rulemaking. The Internal Revenue Service intends to schedule one hearing to receive comments under these proposed rules and under the comprehensive proposed rules that will be published shortly. Notice of the time and place of the hearing will be published in the *Federal Register*. However, the notice and hearing will not cover any of the rules set forth in INTL-52-86. See 53 FR 5991 and 54 FR 11236.

**Drafting Information**

The principal author of these proposed regulations is Renay France of the Office of the Assistant Chief Counsel (Income Tax and Accounting), Internal Revenue Service. However,

other personnel from the Internal Revenue Service and the Treasury Department participated in their development.

Lawrence B. Gibbs,

*Commissioner of Internal Revenue.*

[FR Doc. 89-8041 Filed 4-10-89; 8:45 am]

BILLING CODE 4830-01-M

## DEPARTMENT OF THE INTERIOR

## Minerals Management Service

## 30 CFR Part 218

**Interest Rate Applicable to Late Payments and Underpayments of Oil and Gas Royalties, Rentals, Bonuses, and Other Monies**

March 3, 1989.

**AGENCY:** Minerals Management Service (MMS), Interior.

**ACTION:** Proposed rule.

**SUMMARY:** The Minerals Management Service (MMS) is proposing to amend its regulations at 30 CFR 218.54, 218.55, and 218.103 governing the rate of interest charged on underpayments or late payments of oil and gas royalties, rentals, bonuses, and other monies due the Federal Government by lessees and other royalty payors, and the rate of interest paid on late disbursements of an Indian Tribe's or Allottee's royalty or a State's share of royalty revenues. The existing oil and gas regulations reference section 6621 of the Internal Revenue Code of 1954 for the applicable interest rate. Section 6621 was, however, amended by the 1986 tax reform act and presently references two different interest rates, one rate for overpayments and another rate for underpayments. This proposed rulemaking will clarify the ambiguity in the existing regulations created by the amendment to section 6621 as to which of the two different rates would apply.

The rate of interest charged on underpayment or late payment of monies due on solid mineral or geothermal resource leases is not affected by this proposed rulemaking.

**DATE:** Written comments must be received on or before May 11, 1989.

**ADDRESS:** Written comments may be mailed to Minerals Management Service, Royalty Management Program, Rules and Procedures Branch, Denver Federal Center, Building 85, P.O. Box 25165, Mail Stop 662, Denver, Colorado 80225, Attention: Dennis C. Whitcomb.

**FOR FURTHER INFORMATION CONTACT:** Dennis C. Whitcomb, Chief, Rules and Procedures Branch, (303) 231-3432, (FTS) 326-3432.

**SUPPLEMENTARY INFORMATION:** The principal author of this rule is Randall Drake of the Fiscal Accounting Division of the Minerals Management Service.

### I. Background and Discussion

Section 111 of the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA), 30 U.S.C. 1721, requires the Secretary of the Interior (Secretary) to (1) charge interest on royalty from Federal and Indian oil and gas leases that is either underpaid or paid late (section 111(a), 30 U.S.C. 1721(a)); (2) pay interest on disbursements to States which are not made by the time prescribed under 30 U.S.C. 191, as amended by FOGRMA section 104(a) (section 111(b), 30 U.S.C. 1721(b)); and (3) pay interest to Indian Tribes and allottees if royalty revenues are not disbursed by the date prescribed in FOGRMA section 104(b) (section 111(d), 30 U.S.C. 1721(d)).

Sections 111(a), (b), and (d) of FOGRMA each provide that the interest shall be "at the rate applicable" under section 6621 of the Internal Revenue Code of 1954 (26 U.S.C. 6621). Section 6621 establishes the rate of interest which must be applied to late payment or underpayment of taxes under 26 U.S.C. 6601(a), and to overpayment of taxes under 26 U.S.C. 6611(a). (Until 1975, sections 6601 and 6611 established a fixed rate of 6 percent, with no reference to section 6621. Sections 6601 and 6611 were amended in 1975 by sections 7(a)(2)(A) and 7(a)(2)(LC), respectively, of Pub. L. 93-625, 88 Stat. 2108, 2115, to apply the rate set by section 6621.)

After FOGRMA's enactment, section 6621 was modified. Prior to its amendment by the Tax Reform Act of 1986 (TRA), Pub. L. 99-514, 100 Stat. 2744, section 6621 contained a single rate of interest, 26 U.S.C. 6621 (1982). Thus, the FOGRMA interest provisions imposed the same rate of interest to both underpayments of royalty and to late disbursements to the States and Indians by the Secretary. As amended, however, section 6621 provides for two rates. For underpayments of tax the rate is a "short-term Federal rate" plus three percentage points, 26 U.S.C. 6621(a)(2) (Supp. 1986). For overpayments the rate is the same "short-term Federal rate" plus 2 percentage points, 26 U.S.C. 6621(a)(1) (Supp. 1986). Thus, under section 6621, as amended, underpayments of taxes have a higher rate of interest charged to them than do overpayments of taxes. The effect of this two-rate provision is to impose a higher interest burden on taxpayers who underpay taxes than on the Government when it refunds overpayments of taxes.

The FOGRMA interest provisions invoke the rates established by section 6621 without qualification, and were not amended either in conjunction with or subsequent to the amendment of section 6621 in 1986. The purpose of this rulemaking is to clarify which of the two interest rates in the amended section 6621 is to be applied under the various FOGRMA provisions referring to that section. Under MMS's current rules, which refer only to section 6621 (*see* 30 CFR 218.54, 218.55, and 218.103), there now is an ambiguity as to which of the two section 6621 rates applies.

At the time FOGRMA became law, Congress did not anticipate more than one interest rate reference in section 6621. Consequently, there is nothing in the legislative history to provide guidance for the present situation. The FOGRMA legislative history (H.R. Rep. No. 859, 97th Cong., 2d Sess. 36 (1982), *reprinted in* 1982 U.S. Code Cong. & Admin. News 4268, 4290) discusses only the reason for using the rate from the Internal Revenue Code:

Imposition of such high penalties against those owing money to the United States is to remove the incentives such persons may have to hold the money owed and invest it rather than pay it on time to the MMS. Also, the high penalty required of the United States should be a strong incentive to the MMS to disburse moneys under the mineral leasing laws of 1920 promptly.

Since a rate from section 6621 must be applied under section 111(a), (b), and (d) of FOGRMA, 30 U.S.C. 1721(a), (b), and (d), there are four possible results. First, the "overpayment" rate in section 6621(a)(1) could be applied uniformly under FOGRMA section 111(a), (b), and (d). Second, the "underpayment" rate in section 6621(a)(2) could be applied uniformly under FOGRMA section 111(a), (b), and (d). Third, the "overpayment" rate could be applied under FOGRMA section 111(a) (underpayment or late payment of royalty) and the "underpayment" rate could be applied under FOGRMA section 111(b) and (d) (late disbursement to States and Indians). Fourth, the "overpayment" rate could be applied under FOGRMA section 111(b) and (d) and the "underpayment" rate could be applied under FOGRMA section 111(a).

Regulations governing solid mineral and geothermal resource leases provide for late payment or underpayment charges to be calculated on the basis of a percentage assessment rate. In the absence of a specific lease, permit, license, or contract provision prescribing a different rate, this percentage assessment rate is prescribed by the Department of the Treasury as the "Treasury Current Value of Funds

Rate." Because the interest rate provided for in section 6621 of the Internal Revenue Code of 1954 does not apply to solid mineral or geothermal resource leases, the proposed rulemaking does not apply to solid mineral or geothermal resource leases.

### II. Proposed Rule

As noted above, Congress intended that the interest provisions of FOGRMA would act as incentives to both oil and gas royalty payors and the Government to make required payments in a timely manner. Taken alone, this intent could be fulfilled by any of the four possible applications set out above. The MMS believes that the approach most justified under the two-rate structure of the amended section 6621 is to apply the "underpayment" rate in 26 U.S.C. 6621(a)(2) under FOGRMA section 111(a), 30 U.S.C. 1721(a), and the "overpayment" rate in 26 U.S.C. 6621(a)(1) under FOGRMA section 111(b) and (d), 30 U.S.C. 1721(b) and (d). This approach most conforms with the legislative direction Congress gave Treasury in the Tax Reform Act of 1986.

The intent of the amendment to section 6621 under the TRA is expressed in the Senate Report on H.R. 3838, the bill which ultimately became law. The Senate report states:

[T]he committee is concerned that both the interest rate taxpayers pay the Treasury and the rate the Treasury pays to taxpayers are the same rate. Few financial institutions, commercial operations, or other entities, borrow and lend money at the same rate. Thus, either the rate taxpayers pay the Treasury or the rate the Treasury pays taxpayers is necessarily out of line with general interest rates in the economy. This distortion may cause taxpayers either to delay paying taxes as long as possible to take advantage of an excessively low rate or to overpay to take advantage of an excessively high rate. Consequently, the committee has approved a one-percent differential between these two interest rates.

[S. Rep. No. 313, 99th Cong., 2d Sess. 184 (May 29, 1986). (The relevant language in the House report is identical. *See* H.R. Rep. No. 426, 99th Cong., 1st Sess. 849 (Dec. 7, 1985).]

Although MMS's relationship with its business constituents is not precisely the same as Treasury's relationship with taxpayers, the financial principle that Congress made reference to for Treasury (few institutions borrow and lend money at the same rate) is also valid for MMS. The MMS performs a service and acts as a conduit for funds, disbursing them to States and Tribes as received. Late payment by MMS to States or Tribes are principally caused by payors either not properly identifying funds or paying late. The MMS not only does not have use of

these funds, it is also burdened with the administrative costs necessary to clear and process the funds. In such a role, MMS should not bear the same "loan" (underpayment) rate that a payor is responsible for because of late payments or underpayments. The MMS, therefore, is proposing to be responsible for the "borrow" (overpayment) rate. Therefore, under the proposed rule, the "overpayment" rate in section 6621(a)(1) would be applied where the Federal Government owed money under subsections (b) and (d), and the "underpayment" rate of section 6621(a)(2) would apply where lessees underpay oil and gas royalties, bonuses, and other monies due the Federal Government or pay them late under subsection (a) of FOGRMA section 111.

The regulations implementing the FOGRMA interest provisions are found at 30 CFR 218.54, 218.55, and 218.103. Section 218.54 concerns late payments and underpayments of oil and gas royalties, bonuses, and other monies to the Department of the Interior. Section 218.54(b) sets the rate of interest to be applied to such late payments and underpayments. Section 218.54(b) now refers to "the rate applicable under section 6621 of Title 26 of the Internal Revenue Code of 1954." Under the discussion above, the most appropriate rate of interest under the amended section 6621 is the "underpayment" rate under section 6621(a)(2). Thus, the proposed rule would amend § 218.54(b) to apply the "'underpayment' rate established by § 6621(a)(2) of the Internal Revenue Code."

Section 218.103 concerns disbursements to States of oil and gas lease revenues by the Secretary of the Interior which are not made by the date due. Section 218.103(b) sets the rate of interest to be applied to such late payments. Section 218.103(b) now refers to "the rate applicable under section 6621 of Title 26 of the Internal Revenue Code of 1954." Under the discussion above, the most appropriate rate of interest under the amended section 6621 is the "overpayment" rate under section 6621(a)(1). Thus, the proposed rule would amend § 218.103(b) to apply the "'overpayment' rate established by section 6621(a)(1) of the Internal Revenue Code."

Section 218.55 concerns disbursements to Indian Tribes or allottees of oil and gas lease revenues by the Secretary of the Interior which are not made by the date due. Section 218.55(c) sets the rate of interest to be applied to such late payments. Section 218.55(c) now refers to "the rate applicable under section 6621 of Title

26 of the Internal Revenue Code of 1954." Under the discussion above, the most appropriate rate of interest under the amended section 6621 is the "overpayment" rate under section 6621(a)(1). Thus, the proposed rule would amend § 218.55(c) to apply the "'overpayment' rate established by section 6621(a)(1) of the Internal Revenue Code."

The proposed amendments include two different rates. An alternative to the proposed amendment is to apply a single interest rate to late payments by royalty payors and to late disbursements by MMS. The single rate would be the higher rate of interest established by section 6621(a)(2) of the Internal Revenue Code. This alternative approach would require amending 30 CFR 218.54, 218.55, and 218.103 accordingly. The single interest rate would make the interest burden the same for royalty payors and for MMS. Public comments are also requested on the alternative single rate approach.

The policy of the Department of the Interior is, whenever practicable, to afford the public an opportunity to participate in the rulemaking process. Accordingly, interested persons may submit written comments, suggestions or objections regarding the proposed amendment to the location identified in the ADDRESS section of this preamble. Comments must be received on or before the day specified in the DATE section of this preamble.

**III. Procedural Matters**

*Executive Order 12291 and the Regulatory Flexibility Act*

The proposed rulemaking is necessary to clarify an ambiguity in existing regulations as to which of two interest rates apply. Therefore, the Department has determined that this rulemaking is not a major rule under E.O. 12291 and certifies that this document will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

*Paperwork Reduction Act of 1980*

This rule does not contain information collection requirements which require approval by the Office of Management and Budget under 44 U.S.C. 3501 et seq.

*National Environmental Policy Act of 1969*

It is hereby determined that this rulemaking does not constitute a major Federal action significantly affecting the quality of the human environment and a detailed statement pursuant to section 102(2)(C) of the National Environmental

Policy Act of 1969 [42 U.S.C. 4332(2)(C)] is not required.

**List of Subjects in 30 CFR Part 218**

Coal, Continental shelf, Electronic funds transfer, Geothermal energy, Government contracts, Indian lands, Mineral royalties, Natural gas, Penalties, Petroleum, Public lands—mineral resources, Reporting and recordkeeping requirements.

Date: March 20, 1989.

James E. Cason,  
*Acting Assistant Secretary, Land and Minerals Management.*

For the reasons set out in the preamble, 30 CFR Part 218 is proposed to be amended as set forth below:

**TITLE 30—MINERAL RESOURCES**

**CHAPTER II—MINERALS MANAGEMENT SERVICE, DEPARTMENT OF THE INTERIOR**

**SUBCHAPTER A—ROYALTY MANAGEMENT**

**PART 218—COLLECTION OF ROYALTIES, RENTALS, BONUSES AND OTHER MONIES DUE THE FEDERAL GOVERNMENT**

1. The authority citation for Part 218 continues to read as follows:

Authority: 25 U.S.C. 396 et seq.; 25 U.S.C. 396a et seq.; 25 U.S.C. 2101 et seq.; 30 U.S.C. 181 et seq.; 30 U.S.C. 351 et seq.; 30 U.S.C. 1001 et seq.; 30 U.S.C. 1701 et seq.; 31 U.S.C. 9701; 43 U.S.C. 1301 et seq.; 43 U.S.C. 1331 et seq.; and 43 U.S.C. 1801 et seq.

2. Paragraph (b) of § 218.54 is revised to read as follows:

**§ 218.54 Late payments and underpayments.**

\* \* \* \* \*

(b) The interest charge on late payments and underpayments shall be at the "underpayment" rate established by section 6621(a)(2) of the Internal Revenue Code.

\* \* \* \* \*

3. Paragraph (c) of § 218.55 is revised to read as follows:

**§ 218.55 Interest payments to Indians.**

\* \* \* \* \*

(c) Interest shall be computed at the "overpayment" rate established by section 6621(a)(1) of the Internal Revenue Code.

\* \* \* \* \*

4. Paragraph (b) of § 218.103 is revised to read as follows:

**§ 218.103 Payments to States.**

\* \* \* \* \*

(b) Interest shall be computed at the "overpayment" rate established by



section 6621(a)(1) of the Internal Revenue Code.

\* \* \* \* \*

[FR Doc. 89-8466 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-MR-M

## Office of Surface Mining Reclamation and Enforcement

### 30 CFR Part 920

#### Maryland Regulatory Program; Public Notice, Water Supply Replacement, Bonding, and Enforcement

**AGENCY:** Office of Surface Mining Reclamation and Enforcement (OSMRE), Interior.

**ACTION:** Proposed rule.

**SUMMARY:** OSMRE is announcing the receipt of proposed amendments to the Maryland permanent regulatory program (hereinafter referred to as the Maryland program) under the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The amendments are intended to incorporate rule changes initiated by the State. The proposed changes would revise the public notice and hearing requirements on applications for coal mine permits or permit revisions; would authorize the Maryland Department of Natural Resources (MDDNR) to use funds in the Bituminous Coal Open-Pit Mining Reclamation Fund to replace certain water supplies subject to certain reimbursement requirements; would eliminate the requirements for a mandatory public hearing and provide for an opportunity for a public hearing, upon request, after public notice of the proposal to mine within 100 feet of the outside right-of-way line of any public road; would combine current separate bond requirements for revegetation and permit conformance and establishing a single performance bond; would combine the backfilling and planting report in lieu of current requirements for separate reports at differing time frames; would establish a procedure under which the Director of the Maryland Bureau of Mines (MDBOM) issues an order requiring the operator to show cause why the surface mining permit should not be revoked and provides an operator the opportunity to request an adjudicatory hearing if an operator (a) fails or refuses to comply with the requirements of the subtitle, or (b) abandons an operation; and finally, would provide the MDDNR with the authority to waive mandatory civil penalty assessments for failure of the operator so submit certain administrative reports.

This notice sets forth the times and locations that the Maryland program and proposed amendments to that program are available for public inspection, the comment period during which interested persons may submit written comments on the proposed amendments, and the procedures that will be followed regarding the public hearing, if one is requested.

**DATES:** Written comments must be received on or before 4:00 p.m. on May 11, 1989. If requested, a public hearing on the proposed amendments will be held at 1:00 p.m. on May 8, 1989; request to present oral testimony at the hearing must be received on or before 4:00 p.m. on April 26, 1989.

**ADDRESSES:** Written comments should be mailed or hand delivered to: Mr. James C. Blankenship, Jr., Director, Charleston Field Office, at the address listed below. Copies of the proposed amendments and all written comments received in response to this notice will be available for public review at the addresses listed below during normal business hours, Monday through Friday, excluding holidays. Each requestor may receive, free of charge, one copy of the proposed amendments by contacting OSMRE's Charleston Field Office.

Office of Surface Mining Reclamation and Enforcement, Charleston Field office, 603 Morris Street, Charleston, West Virginia 25301, Telephone: (304) 347-7158

Office of Surface Mining Reclamation and Enforcement, 1100 "L" Street NW., Room 5131, Washington, DC 20240, Telephone: (202) 343-5492

Maryland Bureau of Mines, 69 Hill Street, Frostburg, Maryland 21532, Telephone: (303) 689-4136

**FOR FURTHER INFORMATION CONTACT:** James C. Bankenship, Jr., Director, Charleston Field Office, (304) 347-7158.

#### SUPPLEMENTARY INFORMATION:

##### I. Background

On February 18, 1982, the Secretary of Interior approved the Maryland program. Information regarding general background on the Maryland program, including the Secretary's findings, the disposition of comments, and a detailed explanation of the conditions of approval of the Maryland program can be found in the February 18, 1982, *Federal Register* (47 FR 7214-7217). Subsequent actions concerning the Maryland program which led to further required amendments are discussed at 50 FR 47379-47386 (November 18, 1985) and are contained in 30 CFR 920.16.

##### II. Discussion of Proposed Amendments

By letter dated July 8, 1987, Maryland Bureau of Mines submitted copies of Maryland State House Bill (HB) 692 as a proposed amendment to Maryland's Federally approved program in accordance with 30 CFR 732.17(d). As a result of the amendment, MDBOM will only have to hold public hearings on permit applications when requested.

Section 1 of HB 692 specifically added to Section 7-505(a) of the Maryland Annotated Code that, for those permits issued with right of successive renewal, no hearing is required for revision or renewal.

Section 7-505(c)(1) is modified from "land affected" to "land to be affected" and "notice that public comment will be received" is changed to "notice that written comments and requests for a public hearing will be received."

Changes to 7-05(d)(1) delete a requirement that "The department shall provide for issuance of public notice of opportunity to submit written comments and to request a hearing."

Sections 7-05(d)(1)I, (d)(1)II, and (D)(1)III are added. Sections I and II require the MDBOM to issue public notice of opportunity to submit written comment and to request a hearing. Section III allows MDBOM not to issue public notice if it is not a significant alteration.

Section 7-505(c)(92) is changed to require the MDBOM to provide written notice of applications for permits or permit revisions to any interested person who requests it. In addition, the required time frame for any public hearing is changed to a minimum of 15 days after public notice of the hearing is provided and the latest date for which copies of the permit application are available for public inspection at MDBOM is set at 15 days before the hearing.

Section 2 of HB 692 indicates that these emergency acts became effective June 1, 1987.

By letter dated June 10, 1988, MDBOM also submitted copies of Maryland House Bills 817 and 277 as formal amendments to Maryland's approved program. The amendments include revisions to the requirements for bonding, water replacement and mandatory civil penalties for failure to submit certain administrative reports.

House Bill 817 specifically amends Natural Resources Article (NRA) Title 7, Subtitle 5, sections 7-514(a) and 7-519 and adds to NRA, Title 7, section 7-514.1, provisions to use funds in the Bituminous Coal Open-Pit Mining Reclamation Fund (BCOPMRF) to

replace, in an expedited manner, water supplies impacted by an open-pit mining operations. The replacement fund would be used in those instances wherein water supply loss is found to have occurred after final bond release terminates MDBOM's jurisdiction to order an operator to replace the impacted water supply or to replace a water supply that has been impacted by an operations after the bond covering the operation has been forfeited.

The revision also allows: (a) MDBOM to later recover the cost of replacement from the operator if it is determined judicially or administratively that the water supply loss was due to the mining operation or (b) for the operator to recover costs of replacing water supply from the MDBOM if it is administratively or judicially determined that the water supply loss did not occur due to the mining operation and (c) for MDBOM to recover the cost of water supply replacement from their owner in those cases where the water supply loss was determined not to be caused by the mining operation for which the MDBOM has already expended funds for water supply replacement.

House Bill 277 would enact the following: (a) Eliminates the requirement for a mandatory hearing and provides the opportunity for a public hearing, upon request, after public notice of the proposal to mine in those cases where an application for a permit proposes to mine within 100 feet of the outside right-of-way line of any public road (section 7-505(b)(2)(iii)); (b) replaces the current requirement for two bond types (revegetation and performance) to be filed by a mining operator prior to issuance of a permit with a new requirement of a single (but combined) performance bond of \$500 per acre permitted and a minimum additional \$1,500 per acre for the defined open acreage limit; (c) replace the current requirement for submission of separate backfilling and planting reports within two weeks following the activity with a combined backfilling and planting report to be submitted as late as the next annually required mining and reclamation progress report; (d) defines the contents of the mining and reclamation report, provides the administrative details regarding evaluation and approval of the report, defines phased inspections of the reclaimed areas and phased release of bonding; (e) provides that the MDBOM shall issue a show cause order and provide opportunity for an adjudicatory hearing; (f) in those cases where a mine operator persistently or repeatedly fails

to comply with a notice of violation or a cease and desist order the revision requires MDBOM to set the time, inform all interested parties and conduct the hearing in accordance with Maryland's statutory requirements. If surety refuses to make payment, MDBOM can refer the action to the State Attorney General; and (g) the revision also authorizes MDBOM to waive civil penalty assessments for violations concerning an operator's failure to submit certain administrative reports.

### III. Public Comment Procedures

In accordance with the provisions of 30 CFR 732.17(b), OSMRE is now seeking comments on whether the amendments proposed by Maryland satisfy the applicable program approval criteria of 30 CFR 732.15. If the amendments are deemed adequate, they will become part of the Maryland program.

#### Written Comments

Written comments should be specific, pertain only to the issues proposed in this rulemaking, and include explanations in support of the commentator's recommendations. Comments received after the time indicated under "**DATES**" or at locations other than the OSMRE Charleston Field Office will not necessarily be considered in the final rulemaking or included in the Administrative Record.

#### Public Hearing

Persons wishing to comment at the public hearing should contact the person listed under "**FOR FURTHER INFORMATION CONTACT**" by 4:00 p.m. on April 26, 1989. If no one requests an opportunity to comment at a public hearing, the hearing will not be held.

Filing of a written statement at the time of the hearing is requested as it will greatly assist the transcriber. Submission of written statements in advance of the hearing will allow OSMRE officials to prepare adequate responses and appropriate questions.

The public hearing will continue on the specified date until all persons scheduled to comment have been heard. Persons in the audience who have not been scheduled to comment, and who wish to do so, will be heard following those scheduled. The hearing will end after all persons scheduled to comment and persons present in the audience who wish to comment have been heard.

#### Public Meeting

If only one person requests an opportunity to comment at a hearing, a public meeting rather than a public hearing, may be held. Persons wishing to

meet with OSMRE representatives to discuss the proposed amendments may request a meeting at the OSMRE office listed under "**ADDRESSES**" by contacting the person listed under "**FOR FURTHER INFORMATION CONTACT**." All such meetings will be open to the public and, if possible, notices of meetings will be posted at the locations under "**ADDRESSES**". A written summary of each meeting will be made a part of the Administrative Record.

#### List of Subjects in 30 CFR Part 920

Coal mining, Intergovernmental relations, Surface mining, Underground mining.

Carl C. Close,

Assistant Director, Eastern Field Operations.

Date: April 3, 1989.

[FR Doc. 89-8492 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-05-M

## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Part 73

[MM Docket No. 88-285; RM-6373]

### Radio Broadcasting Services; West Monroe, LA

**AGENCY:** Federal Communications Commission.

**ACTION:** Proposed rule; dismissal.

**SUMMARY:** This document dismisses a petition filed by Bill Dunnivant, proposing the allotment of Channel 247A to West Monroe, Louisiana, as that community's second local FM service, at the request of the petitioner. (See 53 FR 25351, July 6, 1988.) With this action, this proceeding is terminated.

**ADDRESS:** Federal Communications Commission, Washington, DC 20554.

**FOR FURTHER INFORMATION CONTACT:** Patricia Rawlings, (202) 634-6530.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's Report and Order, MM Docket No. 88-285 adopted March 7, 1989, and released March 30, 1989. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC Dockets Branch (Room 230), 1919 M Street, NW., Washington, DC. The complete text of this decision may also be purchased from the Commission's copy contractors, International Transcription Service,

(202) 857-3800, 2100 M Street, NW., Suite 140, Washington, DC 20037.

Karl A. Kensinger,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 89-8408 Filed 4-7-89; 8:45 am]

BILLING CODE 6712-01-M

## INTERSTATE COMMERCE COMMISSION

### 49 CFR Part 1135

[Ex Parte No. 290 (Sub-No. 7)]

#### Productivity Adjustment—Implementation

**AGENCY:** Interstate Commerce Commission.

**ACTION:** Advance notice of proposed rulemaking.

**SUMMARY:** The Commission is requesting comments on several issues concerning the implementation of the productivity adjustment adopted in Ex Parte No. 290 (Sub No. 4), *Railroad Cost Recovery Procedures—Productivity Adjustment*, 54 FR 12920, March 29, 1989.

Comments are requested on the issues of (1) The effect of contract traffic revenues reported in the I.C.C. Waybill Sample on the input series used in calculating the productivity adjustment, (2) The optimum number of years needed to calculate annual average productivity changes, (3) The use of direct physical units of measure rather than expenses for input measurements, and (4) The treatment of below-the-line expenses in constructing the input index.

**DATES:** Notices of intent to file comments are due April 17, 1989.

Comments must be filed by May 26, 1989. Replies are due 30 days thereafter.

**ADDRESS:** Send an original and 15 copies of comments referring to Ex Parte No. 290 (Sub-No. 7) to:

Office of the Secretary, Case Control Branch, Interstate Commerce Commission, Washington, DC 20423.

**FOR FURTHER INFORMATION CONTACT:** William T. Bono (202) 275-7354 or Robert C. Hasek (202) 275-0938 (TDD for hearing impaired (202) 275-1721.)

**SUPPLEMENTARY INFORMATION:** Additional information is contained in

the Commission's decision. To obtain a copy of the full decision write to, call, or pick up in person from: Office of the Secretary, Room 2215, Interstate Commerce Commission, Washington, DC 20423, or telephone (202) 275-7428. Assistance for the hearing impaired is available through TDD services (202) 275-1721.

This action will not significantly affect either the quality of the human environment or energy conservation. It will not have a significant impact on a substantial number of small entities.

#### List of Subjects in 49 CFR Part 1135

Administration practice and procedure, Railroads, Reporting and recordkeeping requirements.

Decided: March 23, 1989.

By the Commission, Chairman Gradison, Vice Chairman Simmons, Commissioners Andre, Lamboley, and Phillips. Chairman Gradison commented with a separate expression.

Noreta R. McGee,

Secretary.

[FR Doc. 89-8624 Filed 4-10-89; 8:45 am]

BILLING CODE 7035-01-M

# Notices

Federal Register

Vol. 54, No. 68

Tuesday, April 11, 1989

This section of the FEDERAL REGISTER contains documents other than rules or proposed rules that are applicable to the public. Notices of hearings and investigations, committee meetings, agency decisions and rulings, delegations of authority, filing of petitions and applications and agency statements of organization and functions are examples of documents appearing in this section.

## DEPARTMENT OF AGRICULTURE

### Animal and Plant Health Inspection Service

[Docket No. 89-050]

#### Notice of Receipt of a Permit Application for Release Into the Environment of Genetically Engineered Organisms

**AGENCY:** Animal and Plant Health Inspection Service, USDA.

**ACTION:** Notice.

**SUMMARY:** We are advising the public that an application for a permit to release genetically engineered organisms into the environment is being reviewed by the Animal and Plant Health Inspection Service. The application has been submitted in accordance with 7 CFR Part 340, which regulates the introduction of certain genetically engineered organisms and products.

**FOR FURTHER INFORMATION CONTACT:** Mary Petrie, Document Control Officer, Biotechnology, Biologics, and Environmental Protection, Biotechnology Permit Unit, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Room 847, Federal Building, 6505 Belcrest Road, Hyattsville, MD 20782, (301) 436-7612.

**SUPPLEMENTARY INFORMATION:** The regulations in 7 CFR Part 340,

"Introduction of Organisms and Products Altered or Produced Through Genetic Engineering Which Are Plant Pests or Which There Is Reason to Believe Are Plant Pests," require a person to obtain a permit before introducing (importing, moving interstate, or releasing into the environment) in the United States, certain genetically engineered organisms and products that are considered "regulated articles." The regulations set forth procedures for obtaining a permit for the release into the environment of a regulated article, and for obtaining a limited permit for the importation or interstate movement of a regulated article.

Pursuant to these regulations, the Animal and Plant Health Inspection Service has received and is reviewing the following application to release genetically engineered organisms into the environment:

Application No.	Applicant	Date received	Organism	Field test location
89-074-01 .....	Calgene, Inc.....	03-15-89	Tobacco plants genetically engineered for lepidopteran insect tolerance.....	California

Done at Washington, DC, this 6th day of April 1989.

James W. Glosser,  
*Administrator, Animal and Plant Health Inspection Service.*  
 [FR Doc. 89-8497 Filed 4-10-89; 8:45 am]  
 BILLING CODE 3410-34-M

### Forest Service

#### Management Plan for the Klickitat National Recreation River, Washington

**AGENCY:** Forest Service, USDA.

**ACTION:** Notice of intent to prepare environmental impact statement.

**SUMMARY:** The Forest Service will prepare an Environmental Impact Statement (EIS) and management plan for the lower Klickitat River, Klickitat County, Washington, designated a National Recreation River by the Columbia River Gorge National Scenic Area Act. The Forest Service invites written comments and suggestions on management of this river and the scope of this analysis. The agency gives notice of the full environmental analysis and decision-making process that will occur on this plan so that interested and

affected people are aware of how they may participate and contribute to the final decision.

**DATE:** Comments concerning the management of this river should be received by May 15, 1989.

**ADDRESS:** Submit written comments and suggestions concerning the management of the river to Arthur W. DuFault, Manager, Columbia River Gorge National Scenic Area, 902 Wasco Avenue, Hood River, Oregon 97031.

**FOR FURTHER INFORMATION CONTACT:** Please direct questions about the proposed action and EIS to Kathy Bulchis, Columbia River Gorge National Scenic Area, 902 Wasco Avenue, Hood River, Oregon 97031, telephone (503) 386-2333.

**SUPPLEMENTARY INFORMATION:** The Columbia River Gorge National Scenic Area Act (Pub. L. 99-663), Nov. 17, 1986, instantly designated the lower segment of the Klickitat River into the National Wild and Scenic River System. The EIS and management plan will address this river segment, as described in Pub. L. 99-663.

Klickitat, Washington: The segment from its confluence with Wheeler Creek,

Washington, near the town of Pitt, Washington, to its confluence with the Columbia River; to be classified as a recreation river and to be administered by the Secretary of Agriculture.

James F. Torrence, Regional Forester, Pacific Northwest Region, Portland, Oregon, is the Deciding Officer.

Public participation will be especially important at several points during the management plan process. The first point is the scoping process (40 CFR 1501.7). The Forest Service is seeking information, comments, and assistance from Federal, State and local agencies, the Yakima Indian Nation, individuals and organizations who may be interested in or affected by the proposed action. This input will be used in the preparation of the draft EIS.

Public meetings will be held during April, 1989, to inform the public of the planning process and to provide for public participation and involvement. Federal, State, and local agencies as well as the Yakima Indian Nation, user groups, and other organizations who may be interested in the plan will be invited to participate in scoping the issues that should be considered. In addition, a twenty person Task Force

representing these interests has been formed to help develop recommendations for future management of the river.

The Draft Environmental Impact Statement and Management Plan are expected to be filed with the Environmental Protection Agency (EPA), and available for public review by April 1990. At that time the EPA will publish a notice of availability of the draft EIS in the **Federal Register**.

The comment period on the draft EIS will be 90 days from the date the EPA's notice of availability appears in the **Federal Register**. It is very important that those interested in the management of the river participate at that time. To be most helpful, comments on the draft EIS should be as specific as possible and may address the adequacy of the statement or the merits of the alternatives discussed (see The Council on Environmental Quality Regulations for implementing the procedural provisions of the National Environmental Policy Act of 40 CFR 1503.3). In addition, Federal court decisions have established that reviewers of draft EIS must structure their participation in the environmental review of the proposal so that it is meaningful and alerts an agency to the reviewers' position and contentions, *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553 (1978), and that environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final EIS. *Wisconsin Heritages, Inc. v. Harris*, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). The reason for this is to ensure that substantive comments and objections are made available to the Forest Service at a time when it can meaningfully consider them and respond to them in the final.

After the comment period ends on Draft EIS, comments will be analyzed and considered by the Forest Service in preparing Final EIS and Management Plan. In the final, the Forest Service is required to respond to comments received (40 CFR 1503.4). The Final EIS is scheduled to be completed by the end of October, 1990. The Deciding Officer will consider the comments, responses, and consequences discussed in the EIS, applicable laws, regulations, and policies in making a decision regarding the management of the river. The Deciding Officer will document the decision and reasons for the decision in the Record of Decision. That decision will be subject to appeal under 36 CFR Part 217.

Date: April 5, 1989.

Richard A. Ferraro,

Acting Regional Forester.

[FR Doc. 89-8480 Filed 4-10-89; 8:45 am]

BILLING CODE 3410-11-M

## DEPARTMENT OF COMMERCE

### International Trade Administration

#### Code of Conduct for Proceedings Under Chapters 18 and 19 of the United States-Canada Free-Trade Agreement

**AGENCY:** United States-Canada Free-Trade Agreement, Binational Secretariat, United States Section, International Trade Administration, Department of Commerce.

**ACTION:** Notice.

**SUMMARY:** Pursuant to Article 1910 of the United States-Canada Free-Trade Agreement ("Agreement") signed on January 2, 1988, the Government of the United States and the Government of Canada established a Code of Conduct for members of panels and extraordinary challenge committees established under Articles 1806, 1807, 1903, and 1904 of the Agreement.

**EFFECTIVE DATE:** The Code of Conduct took effect on the date that the Agreement entered into force, January 1, 1989.

**FOR FURTHER INFORMATION CONTACT:** James R. Holbein, Acting U.S. Secretary, Binational Secretariat, Suite 4012, 14th and Constitution Avenue NW., Washington, DC 20230, (202) 377-5438.

**SUPPLEMENTARY INFORMATION:** To ensure the integrity and impartiality of proceedings conducted pursuant to Articles 1806, 1807, 1903, and 1904 of the United States-Canada Free-Trade Agreement ("Agreement"), which entered into force on January 1, 1989, the Government of the United States and the Government of Canada established a Code of Conduct for members of panels and extraordinary challenge committees, in accordance with Article 1910 of the Agreement.

#### Code of Conduct for Proceedings Under Chapters 18 and 19 of the United States-Canada Free-Trade Agreement

##### Preamble

Whereas the Parties place prime importance on the integrity and impartiality of proceedings conducted pursuant to Articles 1806, 1807, 1903 and 1904 of the Free Trade Agreement between Canada and the United States ("Agreement"), the Parties hereby

establish this Code of Conduct to ensure that these principles are respected.

##### Interpretation

In this Code,

"Assistant" means a person which each member by that member's terms of appointment may use for the purposes of research and support;

"Candidate" means an individual on a roster, or any other person, who is being considered for appointment as a panelist pursuant to Articles 1806 or 1807, or Annex 1901.2, or as a committee member pursuant to Annex 1904.13;

"Member" means a member of a panel constituted pursuant to Article 1806, 1807, 1903 or 1904 of the Agreement or a member of an extraordinary challenge committee constituted pursuant to Annex 1904.13 of the Agreement;

"Party" means the Government of Canada or the Government of the United States of America; and

"Proceeding" unless otherwise specified, means a proceeding conducted by a panel pursuant to Article 1806 or 1807, a review conducted by a panel under Article 1903, a review by a panel under Article 1904 or a proceeding conducted by an extraordinary challenge committee.

##### I. Responsibility to the Process

A candidate or member shall avoid impropriety and the appearance of impropriety and shall observe high standards of conduct so that the integrity, fairness, and independence of the dispute settlement process will be preserved.

##### II. Independence and Impartiality

A member shall be independent and impartial. A member shall act in a fair manner and avoid the appearance of partiality.

A member shall not be influenced by self-interest, outside pressure, public clamour, loyalty to a Party, or fear of criticism.

A member shall not incur any obligation or accept a benefit of any kind, directly or indirectly, which would in any way interfere or appear to interfere with the proper discharge of the member's functions.

While sitting on a panel or committee, a member shall not use the power of membership to advance any personal or private interests. A member shall not act in a manner that would create the impression that others are in a special position to influence the member. A member should make every effort to prevent or discourage others from presenting themselves as being in such a position.

A member shall not allow past or existing financial, business, professional, family, or social relationships or responsibilities to influence the member's conduct or judgment. A member shall avoid entering into any such relationship, or acquiring any financial or personal interest, that is likely to affect the member's impartiality or that might reasonably create the appearance of bias. For a period of one year after completion of a Chapter 19 proceeding, a former member shall not personally advise or represent any participant in the proceeding with regard to antidumping or countervailing duty matters. A former member shall otherwise avoid impropriety or actions that may reasonably give the appearance that the member was biased in his or her functions as a member by the expectation of benefiting therefrom.

In the case of a proceeding conducted under Article 1904, a member or former member shall not represent a participant either in a domestic court proceeding involving the same goods from third countries whose imports were cumulated with those from a Party for the purpose of an injury determination or any court proceeding attempting to challenge the proceeding.

### III. Disclosure Obligations

#### Introductory Note

The governing principle of this Code is that a candidate or member must disclose the existence of any interests or relationships that are likely to affect the candidate's or member's independence and impartiality or that might reasonably create the appearance of bias.

These disclosure obligations, however, should not be interpreted so that the burden of detailed disclosure makes it impractical for persons in the legal or business community to serve as members, thereby depriving the Parties and participants of the services of those who might be best qualified to serve as members. Thus, a candidate or member should not be called upon to disclose interests or relationships whose bearing on their role in the proceeding would be trivial, but should be aware of the continuing obligation to disclose relationships or interests that may bear on the impartiality or the integrity of the process.

This Code does not determine whether or under what circumstances the Parties will exclude a candidate or member from membership on a panel or committee on the basis of disclosures made. Moreover, this Code does not preclude the Parties with knowledge of a candidate's or member's interests and relationships from waiving any objection to that candidate's or member's service. Therefore, a candidate or member who has made the disclosures required by this Code, may be selected or may be permitted to continue to served as a member.

A candidate shall disclose to the appointing Party any interests or relationships that are likely to affect the candidate's independence and impartiality or might reasonably create the appearance of bias in a particular appointment. To this end, a candidate shall make a reasonable effort to become aware of and shall disclose any such interests and relationships including:

- (1) Any direct or indirect financial or personal interest in the outcome of the proceeding;
- (2) Any existing or past financial, business, professional, family, or social relationship, or any such relationship involving a family member, current employer, partner, or business associate; and
- (3) Public advocacy of a position on an issue in dispute in the proceeding that was not in the normal course of legal or other representation.

Once appointed, a member shall continue to make a reasonable effort to become aware of and to disclose any interests or relationships included in the previous paragraph. The obligation to disclose is a continuing duty which requires a member to disclose any such interests or relationships that may arise during any stage of the proceeding.

### IV. The Performance of Duties in a Fair and Diligent Manner

A candidate shall accept appointment as a member only if the candidate is available to perform a member's duties thoroughly and expeditiously.

A member shall carry out all duties fairly and diligently. These duties include the following:

- (1) A member shall comply with the provisions of Chapter 18 or 19 of the Agreement and any applicable rules of procedure;
- (2) A member shall neither exceed that member's authority nor do less than is required to exercise that authority;
- (3) Except as expressly permitted by the applicable rules of procedure, a member shall not engage in *ex parte* communications concerning the pending proceeding, with the exception of *ex parte* communications with a Party concerning actual or potential conflicts of interest;
- (4) A member shall not deny other members the opportunity to participate in all aspects of the proceeding;
- (5) A member shall consider only those issues submitted and necessary to a decision; and
- (6) A member shall not delegate the duty to decide to any other person.

### V. Maintenance of Confidentiality

A member or former member shall not at any time disclose, except as permitted by any applicable rules of procedure, or use any non-public information acquired during the proceeding to gain personal advantage or advantage for others, or to affect adversely the interest of another.

A member shall not inform anyone of a decision in a Chapter 19 proceeding prior to its issuance. A member shall not inform anyone of a panel report issued under Chapter 18 prior to publication of the report by the Parties. A member or former member shall abstain from any disclosure concerning the proceeding or the panel's deliberations in which he or she participated and shall require similar abstention on the part of personnel subject to that member's direction and control. Except as authorized by law, a member or former member shall not disclose the deliberations of a panel or committee, or any member's view, even after the proceeding has been completed.

### VI. Assistants

A member may not use any person, other than an assistant, to help in such member's work.

A member shall ensure that the member's assistant complies with this Code of Conduct with the exception of paragraphs 2, 4, 5 and 6 listed in Part IV.

An assistant shall comply with this Code of Conduct with the exception of paragraphs 2, 4, 5 and 6 of Part IV.

Date: April 6, 1989.

James R. Holbein,

Acting U.S. Secretary, FTA Binational Secretariat.

[FR Doc. 89-8525 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-DA-M

### Model Rules of Procedure for Chapter 19 Panels; United States-Canada Free Trade Agreement

**AGENCY:** United States-Canada Free Trade Agreement, Binational Secretariat, United States Section, International Trade Administration, Department of Commerce.

**ACTION:** Notice.

**SUMMARY:** Pursuant to Article 1807 of the United States-Canada Free Trade Agreement ("Agreement") signed on January 2, 1988, the Government of the United States and the Government of Canada established model rules of procedure for panels constituted under Articles 1806 and 1807 of the Agreement.

**EFFECTIVE DATE:** These rules took effect on the date that the Agreement entered into force, January 1, 1989.

**FOR FURTHER INFORMATION CONTACT:** James R. Holbein, Acting U.S. Secretary, Binational Secretariat, Suite 4012, 14th and Constitution Ave. NW., Washington, DC 20230, (202) 377-5438.

**SUPPLEMENTARY INFORMATION:** Under the Article 1806 of the U.S.-Canada Free-Trade Agreement ("Agreement"), the Canada-United States Trade Commission ("Commission") is required to refer disputes regarding actions taken pursuant to Chapter Eleven (Emergency Action) of the Agreement to binding arbitration. In addition, the Commission may refer any other dispute to binding arbitration.

Under Article 1807 of the Agreement, the Commission must establish a panel to consider disputes that have been referred to the Commission under Article 1805 of the Agreement and have not been resolved or have not been referred to arbitration pursuant to Article 1806 of the Agreement.

The Government of the United States and the Government of Canada have established model rules of procedure for use by panels constituted under Article 1807 of the Agreement. The model rules may also be used by arbitration panels constituted under Article 1806 of the Agreement.

#### Part I—General

1. These rules are intended to be used by a panel constituted under Article 1807 of the Agreement unless otherwise decided by the Commission, and may be used for panels constituted under Article 1806. These rules supplement the provisions of the Agreement.

2. In these rules:

"Agreement" means the Free Trade Agreement between the Government of Canada and the Government of the United States of America;

"Commission" means the Canada-United States Trade Commission constituted pursuant to Article 1802 of the Agreement;

"Panel" means panel established pursuant to Article 1806 or 1807 of the Agreement;

"Party" means the Government of Canada or the Government of the United States of America;

"Responsible Secretary" means the Secretary of the Party in whose territory the panel proceeding takes place;

"Secretary" means the Canadian Secretary or the United States Secretary

appointed pursuant to Article 1909 of the Agreement.

#### Part II—Constitution of Panels

1. In the case of the death, retirement, disqualification or disability of one of the panel members, that place shall be filled in the same manner in which the panel member was appointed pursuant to the provisions of Article 1807(3) of the Agreement.

#### Part III—Operation of the Panel

1. The panel proceedings commenced at the request of one Party shall take place in the capital of the other Party, unless the Parties otherwise agree.

2. The chairman of the panel shall preside at all its meetings.

3. The chairman of the panel shall fix the date and hour of its sittings in accordance with these rules and following consultations with other panel members and the Responsible Secretary.

4. Panel meetings involving purely administrative matters may be conducted by means of telephone conference call.

5. The Responsible Secretary shall expeditiously forward to the other Secretary copies of all official letters, documents, records or other papers received or filed with the Responsible Secretary pertaining to any proceeding before a panel.

#### Part IV—Written Submissions

1. The initial written submission by the Party that requested the panel shall be filed with the Responsible Secretary no later than (10) days following the date upon which the chairman of the panel is appointed.

2. A written counter-submission by the other Party shall be filed no later than (20) days after the filing of the first submission.

3. The panel should fix the time for any further written submissions. The Parties shall be accorded the opportunity to make an equal number of written submissions, subject to the time limitations imposed by the panel under Chapter 18.

#### Part V—Oral Proceedings

1. The panel shall fix dates for oral proceedings.

2. All panelists must be presented during the oral proceedings.

3. In the case of the death, retirement, disqualification or disability from any cause of one of the panel members after oral argument has begun, the Chairman may order that the matter be reheard on such terms as are appropriate after the selection of a substitute panelist pursuant to Part II:2 above.

4. The oral proceedings shall be

conducted in the following manner ensuring that each Party has the opportunity of equal time:

(a) Argument of the Party commencing the proceeding.

(b) Argument of the other Party.

(c) Reply of the Party commencing the proceeding.

(d) Counter-reply of the other Party

5. At the request of a Party, or at the initiative of the panel, the panel may call upon any person to provide information concerning the matter in dispute, provided that both Parties so agree and subject to such terms and conditions as both Parties may agree.

#### Part VI—Confidentiality and Ex Parte Contacts

1. The proceedings and deliberations of the panel shall be confidential. It is the responsibility of each Party to ensure that those persons attending the oral proceedings on its behalf maintain the confidentiality of the proceedings.

2. The panel shall not meet or contact one Party in the absence of the other. No panel member shall discuss the matter before the panel with a Party or Parties in the absence of other panel members.

#### Part VII—Translation and Interpretation

1. The written and oral proceedings may be in either English or French or both.

2. The Responsible Secretary shall provide for interpretation and translation as the case may be of written and oral proceedings if a Party or panelist so requests.

3. The report of a panel issued in one language shall be promptly translated into the other.

#### Part VIII—Report

1. The deliberations of the panel shall take place in private and remain confidential. Only panelists may take part in the deliberations. Assistants to the panelists and any necessary staff may be present by permission of the panel.

2. In accordance with Article 1807(5) and unless the Parties otherwise agree, the panel shall present to the Parties an initial report no later than three months after the chairman is appointed.

Date: April 6, 1989.

**James R. Holbein,**

*Acting U.S. Secretary, FTA Binational Secretariat.*

[FR Doc. 89-8526 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-DA-M

### Minority Business Development Agency

#### Business Development Center Applications: State of Connecticut

**AGENCY:** Minority Business Development Agency, Commerce.

**ACTION:** Notice.

**SUMMARY:** The Minority Business Development Agency (MBDA) announces that it is soliciting competitive applications under its Minority Business Development Center (MBDC) program to operate an MBDC for approximately a 3-year period, subject to the availability of funds. The cost of performance for the first 12 months is estimated at \$184,260 in Federal funds and a minimum of \$32,516 in non-Federal contributions for the budget period August 1, 1989 to July 31, 1990. Cost-sharing contributions may be in the form of cash contributions, client fees for services, in-kind contributions, or combinations thereof. The MBDC will operate in the Connecticut SMSA geographic service area.

The funding instrument for the MBDC will be a cooperative agreement. Competition is open to individuals, non-profit and for-profit organizations, state and local governments, American Indian tribes, and educational institutions.

The MBDC program is designed to provide business development services to the minority business community for the establishment and operation of viable minority businesses. To this end, MBDA funds organizations that can coordinate and broker public and private resources on behalf of minority individuals and firms; offer a full range of management and technical assistance; and serve as a conduit of information and assistance regarding minority business.

Applications will be evaluated on the following criteria: the experience and capabilities of the firm and its staff in addressing the needs of the business community in general and, specifically, the special needs of minority businesses, individuals and organizations (50 points); the resources available to the firm in providing business development services (10 points); the firm's approach (techniques and methodology) to performing the work requirements included in the application (20 points); and the firm's estimated cost for providing such assistance (20 points). An application must receive at least 70% of the points assigned to any one evaluation criteria category to be considered programmatically acceptable and responsive.

MBDCs shall be required to contribute at least 15% of the total project cost through non-Federal contributions. Client fees for billable management and technical assistance (M&TA) rendered must be charged by MBDCs. Based on a standard rate of \$50 per hour, MBDCs will charge client fees at 20% of the total cost for firms with gross sales of \$500,000 or less and 35% of the total cost for firms with gross sales of over \$500,000.

The MBDC may continue to operate, after the initial competitive year, for up to 2 additional budget periods. Periodic reviews culminating in year-to-date quantitative and qualitative evaluations will be conducted to determine if funding for the project should continue. Continued funding will be at the discretion of MBDA based on such factors as an MBDC's satisfactory performance, the availability of funds, and Agency priorities.

**DATE:** Closing date: The closing date for applications is May 26, 1989. Applications must be postmarked on or before May 26, 1989.

**ADDRESS:** New York Regional Office, Minority Business Development Agency, Jacob K. Javits Federal Bldg., Rm. 3720, New York, New York 10278, Area Code/ Telephone Number (212) 264-3262.

**FOR FURTHER INFORMATION CONTACT:** Gina A. Sanchez, Regional Director, New York Regional Office. (212) 264-3262.

**SUPPLEMENTARY INFORMATION:** Anticipated processing time of this award is 120 days. Executive order 12372 "Intergovernmental Review of Federal Programs" is not applicable to this program. Questions concerning the preceding information, copies of application kits, and applicable regulations can be obtained at the above address. A Pre-application Conference to assist all interested applicants will be held on May 1, 1989, from 10:00 a.m. until 3:00 p.m. in Hartford, Connecticut at the Hartford Federal Building, 450 Main Street, Rm. 126. For information please contact the MBDA Boston District Office at (617) 565-6850.

(11.80 Minority Business Development)  
(Catalog of Federal Domestic Assistance)

Date: April 3, 1989.

Gina A. Sanchez,  
Regional Director, New York Regional Office.

[FR Doc. 89-8719 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-21-M

### Business Development Center Applications: State of Connecticut (Service Area)

**AGENCY:** Minority Business Development Agency, Commerce.

**ACTION:** Notice.

**SUMMARY:** The Minority Business Development Agency (MBDA) is cancelling the announcement to solicit competitive applications under its Minority Business Development Center program to operate a MBDC for a three (3) year period, starting August 1, 1989 to July 31, 1990 in the Connecticut Standard Metropolitan Statistical Area. Refer to the *Federal Register* dated March 17, 1989, Vol. 54, No. 51, page 11260.

Date: April 3, 1989.

Gina A. Sanchez,

Regional Director, New York Regional Office.

[FR Doc. 89-8718 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-21-M

### National Oceanic and Atmospheric Administration

#### South Atlantic Fishery Management Council; Amended Meeting Agenda

**AGENCY:** National Marine Fisheries Service, NOAA, Commerce.

The agenda as published in the *Federal Register* (54 FR 13548, April 4, 1989) has been amended for meetings of the South Atlantic Fishery Management Council's Committees, and for the joint South Atlantic and Gulf of Mexico Fishery Management Council meeting.

On April 27, 1989, the Billfish Committee is scheduled to meet at 8:30 a.m., followed by a meeting at 1:30 p.m., of the Swordfish Committee.

On April 28 from 8:00 a.m. to 8:30 a.m., the Executive Committee, and from 8:30 a.m. to 10 a.m., the Advisory Panel Selection Committee will meet in closed sessions to discuss personnel matters.

Joint discussions between the South Atlantic and Gulf of Mexico Fishery Management Councils scheduled for April 26, 1989, have been cancelled. The Councils were to discuss Spiny Lobster Amendment #2.

All other information as originally published remains unchanged. A detailed agenda is available to the public. For further information contact Carrie R.F. Knight, Public Information Specialist, South Atlantic Fishery Management Council, One Southpark Circle, Suite 306, Charleston, SC 29407; telephone: (803) 571-4366.



Date: April 5, 1989.

Alan Dean Parsons,

Acting Director, Office of Fisheries  
Conservation and Management, National  
Marine Fisheries Service.

[FR Doc. 89-8518 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-22-M

### South Atlantic Fishery Management Council; Amended Meeting Agendas

**AGENCY:** National Marine Fisheries  
Service, NOAA, Commerce.

The joint public meeting of the Gulf of Mexico and South Atlantic Fishery Management Councils' Scientific and Statistical Committees (SSCs), to review the stock assessment for swordfish on April 17, 1989, as published in the *Federal Register* (54 FR 11558, March 21, 1989), has been cancelled. However, the Councils' SSCs will hold their joint public meeting on April 18, 1989, as scheduled, at the Howard Johnson Plaza Hotel, 700 N. Westshore Boulevard, Tampa, FL. The SSCs will discuss the stock assessment for mackerel, recommend a total allowable catch for Gulf and Atlantic groups of king and Spanish mackerel, and review options for Amendment #5 to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. The SSCs will begin the meeting at 8 a.m., and will adjourn at 5 p.m.

The agenda, as published in the *Federal Register* (54 FR 13097, March 30, 1989), has been amended for the public meeting of the South Atlantic Fishery Management Council's King and Spanish Mackerel Advisory Panel. The meeting, changed from April 19-20, 1989, to April 21, 1989, will begin at 8 a.m., at the Council's Headquarters (address below), and will adjourn at approximately 3 p.m. All other agenda information as originally published remains unchanged.

Detailed agendas are available to the public. For further information contact Carrie R.F. Knight, South Atlantic Fishery Management Council, One Southpark Circle, Suite 306, Charleston, SC 29407; telephone: (803) 571-4366.

Date: April 5, 1989.

Alan Dean Parsons,

Acting Director, Office of Fisheries  
Conservation and Management, National  
Marine Fisheries Service.

[FR Doc. 89-8519 Filed 4-10-89; 8:45 am]

BILLING CODE 3510-22-M

### CONSUMER PRODUCT SAFETY COMMISSION

#### Commission Priorities; Public Meeting

**AGENCY:** Consumer Product Safety  
Commission.

**ACTION:** Notice of public meeting.

**SUMMARY:** The Commissioners will conduct a public meeting\* to obtain views from all interested parties about priorities for Commission attention during fiscal year 1991. Participation by members of the public is invited. Written comments and oral presentations concerning Commission priorities will become part of the public record. This meeting is being held solely to obtain the views of members of the public about the Commission's priorities. No decisions will be made concerning the selection of priorities.

**DATES:** The meeting will begin at 10:00 a.m. on May 11, 1989. Requests from members of the public who desire to make oral presentations must be received by the Office of the Secretary not later than April 27, 1989. Persons desiring to make presentations at this meeting must submit a written text or summary of their presentations not later than April 27, 1989. Written comments submitted in lieu of oral presentations will be accepted until May 4, 1989.

**ADDRESS:** The meeting will be in room 556, 5401 Westbard Avenue, Bethesda, Maryland. Written comments should be mailed to the Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207.

**FOR FURTHER INFORMATION CONTACT:** For information about the meeting or to request opportunity to make a presentation at the meeting, call or write Sheldon Butts, Deputy Secretary, Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 492-6800.

**SUPPLEMENTARY INFORMATION:** The purpose of the meeting on May 11, 1989, is to obtain views concerning projects and activities which should be given priority attention during fiscal year 1991, which begins October 1, 1990. The

\* As of the date of publication of this notice in the *Federal Register*, only two Commissioners are serving as members (Acting Chairman Anne Graham and Commissioner Carol Dawson). In accordance with section 4(d) of the Consumer Product Safety Act, 15 U.S.C. 2053(d), three Commission members must be serving to make a quorum. Therefore, unless a third Commissioner is sworn in and present for the May 11, 1989, meeting, the meeting will not be conducted as an official meeting under the Government in the Sunshine Act, 5 U.S.C. 552. Instead, it will be an informal meeting of the Commissioners and those members of the public wishing to participate.

Commissioners desire to obtain views from a wide range of interested parties including consumers; manufacturers, importers, distributors, and retailers of consumer products; member of the academic community; and health and safety officers of state and local governments.

The Commission is charged by Congress with protection of the public from unreasonable risks of injury associated with consumer products. The Commission enforces and administers the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*); the Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*); Flammable Fabrics Act (15 U.S.C. 1191 *et seq.*); the Poison Prevention Packaging Act of 1970 (15 U.S.C. 1471 *et seq.*); and the Refrigerator Safety Act (15 U.S.C. 1211 *et seq.*). Standards and regulations issued under provisions of those statutes are codified in the Code of Federal Regulations, Title 16, Chapter II.

While the Commission has broad jurisdiction over products used by consumers in or around their homes, in schools, in recreation, and other settings, its staff and budget are limited. For this reason, the Commission must concentrate its resources on the most serious hazards associated with consumer products within its jurisdiction in order to discharge its Congressional mandate effectively. Commission priorities are selected in accordance with the Commission policy governing establishment of priorities codified at 16 CFR 1009.8.

Persons who desire to make presentations at the meeting on May 11, 1989, should call or write Sheldon Butts, Deputy Secretary, Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 492-6800, not later than April 27, 1989.

Presentations should be limited to approximately ten minutes. Persons desiring to make presentations must submit the written text or a summary of their presentations to the Office of the Secretary not later than April 27, 1989. The Commission reserves the right to impose further time limitations on all presentations and further restrictions to avoid duplication of presentations. The public meeting will begin at 10:00 a.m. on May 11, 1989, and will conclude the same day.

Written comments submitted in lieu of oral presentations should be received in the Office of the Secretary not later than May 4, 1989.

Dated: April 6, 1989.

Sadye E. Dunn,

Secretary, Consumer Product Safety  
Commission.

[FR Doc. 89-8515 Filed 4-10-89; 8:45 am]

BILLING CODE 6335-01-M

## DEPARTMENT OF DEFENSE

### Environmental Assessment; Ground-Based Radar Demonstration/Validation Testing

**AGENCY:** Strategic Defense Initiative Organization, DOD.

**ACTION:** Notice of Availability of Finding of No Significant Impact.

**SUMMARY:** The Department of Defense has prepared a finding of no significant impact based on an Environmental Assessment of a proposal to conduct "Demonstration/Validation" testing for the Ground-Based Radar (GBR) technology program. Pursuant to DOD regulations and regulations of the President's Council on Environmental Quality, a Milestone I decision on whether to proceed with the proposed action will be made upon expiration of a 30 day period commencing with the date of this notice.

#### Background

The GBR technology program is currently in the Concept Exploration phase of the DOD systems acquisition process. However, as a result of technical progress, the GBR technology program is being proposed for advancement to the Demonstration/Validation phase.

The Department of Defense major system acquisition procedures, set forth in DOD Directive 5000.1, provide for milestone reviews of major programs by the Defense Acquisition Board (DAB), chaired by the Under Secretary of Defense, Acquisition. DAB recommendations are forwarded to the Secretary of Defense for final approval. Major milestones are: Milestone 0—Program Initiation/Mission—Need Decision (Concept Exploration); Milestone I—Concept Demonstration/Validation Decision; Milestone II—Full-Scale Development Decision; Milestone III—Full—Rate Production Decision; Milestone IV—Logistics Readiness and Support Review; and Milestone V—Major Upgrade or System Replacement Decision.

Numerous supporting documents are reviewed prior to a milestone decision. Among these documents is environmental impact analysis documentation. This environmental documentation ensures that

decisionmakers consider the environmental consequences of the proposed action and alternatives.

DOD Directive 6050.1 establishes the DOD environmental impact analysis process. This directive implements the National Environmental Policy Act (NEPA) of 1969 (Pub. L. No. 91-90 (1970), 42 U.S.C. 4321, 4331-4335, 4341-4347 (1976) and the President's Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, (40 CFR Parts 1500 through 1508).

#### GBR Technology Program

The current GBR concept is a large, complex, phased-array, x-band radar system. It is a long-range radar that will be used to perform surveillance, acquisition, tracking, and discrimination of multiple targets; it also provides ballistic firing data for the interception of submarine-launched ballistic missiles or intercontinental ballistic missiles. The basic thrust of the efforts already accomplished in Concept Exploration has been to assess the technical feasibility of GBR in the context of a complete strategic defense system.

The GBR Demonstration/Validation program will consist of a number of test activities to be conducted at five different testing sites. These activities are categorized as analyses, simulations, component/assembly testing, and validation testing.

The locations of test activities for GBR Demonstration/Validation activities include Vandenberg AFB, CA; The National Test Facility, Falcon AFB, CO; Hill AFB, UT, the Raytheon Company, Wayland, MA; and the U.S. Army Kwajalein Atoll (USAKA), Republic of the Marshall Islands. Of these, the major component/assembly testing and all validation testing of the radar will occur at USAKA.

In addition to the above test activities, a no action alternative was considered. An environmental impact analysis was conducted for test activities at each location. An environmental assessment was prepared documenting the results of those analyses. To determine the potential for significant environmental impacts of Demonstration/Validation testing of the GBR technology, the magnitude and frequency of the tests that would be conducted at the proposed test locations were compared to the current activities at those locations.

The proposed test activities were evaluated to assess impacts in the following areas: air quality, biological resources, cultural resources, hazardous waste, infrastructure, land use, noise, public health and safety,

socioeconomics, and water quality. As a result of that evaluation, consequences were assigned to one of three categories: insignificant, mitigable and non-significant, or potentially significant.

The following methodology was used. Environmental consequences were determined to be insignificant if no serious concerns existed regarding impacts to the affected area. Consequences were deemed mitigable and non-significant if concerns existed but it was determined that all of those concerns could be readily mitigated through standard procedures or by measures recommended in existing environmental documentation. If serious concerns were identified that could not be readily mitigated, the activity was determined to represent potentially significant consequences.

Insignificant environmental consequences were found for all of the test activities at Vandenberg AFB, The National Test Facility at Falcon AFB, Hill AFB, and the Raytheon Company at Wayland, MA.

Mitigable and non-significant consequences resulting from component/assembly and validation testing were found at USAKA. Potential cultural resources impacts are mitigated by an archaeological monitoring, sampling and data recovery program to be implemented during construction. Potential public health and safety impacts involve the exposure of personnel to electromagnetic radiation (EMR) and inadvertent ignition of fuel, detonation of electroexplosive devices and ordnance (ammunition); and interference to critical aircraft electronic systems of aircraft landing on Kwajalein Island.

EMR impacts are mitigated by designed-in limitations on radar beam elevations and power densities. In addition, independent monitoring will be established to validate EMR exposure limits. Other potential public health and safety impacts identified are mitigated by ensuring that electromagnetic field intensities are within applicable guidelines and through routine scheduling and coordination with U.S. Army Kwajalein Atoll range personnel of GBR operations and any fueling, explosive/ordnance, aircraft.

#### Finding of No Significant Impact

Based upon the foregoing, the DOD has concluded that the proposed action, to conduct the Demonstration/Validation test program for the GBR Technology program, would be significantly impact the human environment.

**FOR FURTHER INFORMATION CONTACT:**

Captain G. Brown, (202) 693-1833.

**ADDRESS: SDIO/S/PL-CE,**

Environmental Documents, The Pentagon, Room 1E149, Washington, DC, 20301-7100.

L.M. Bynum,

*Alternate OSD Federal Register Liaison Officer, Department of Defense.*

April 6, 1989.

[FR Doc. 89-8510 Filed 4-10-89; 8:45 am]

BILLING CODE 3810-01-M

**Office of the Secretary****Department of Defense Wage Committee; Closed Meetings**

Pursuant to the provisions of section 10 of Pub. L. 92-463, the Federal Advisory Committee Act, notice is hereby given that a meeting of the Department of Defense Wage Committee will be held on Tuesday, May 2, 1989; Tuesday, May 9, 1989; Tuesday, May 16, 1989; Tuesday, May 23, 1989; and Tuesday, May 30, 1989 at 10:00 a.m. in Room 1E801, The Pentagon, Washington, DC.

The Committee's primary responsibility is to consider and submit recommendations to the Assistant Secretary of Defense (Force Management and Personnel) concerning all matters involved in the development and authorization of wage schedules for federal prevailing rate employees pursuant to Pub. L. 92-392. At this meeting, the Committee will consider wage survey specifications, wage survey data, local wage survey committee reports and recommendations, and wage schedules derived therefrom.

Under the provisions of section 10(d) of Pub. L. 92-463, meetings may be closed to the public when they are "concerned with matters listed in 5 U.S.C. 552b." Two of the matters so listed are those "related solely to the internal personnel rules and practices of an agency," (5 U.S.C. 552b.(c)(2)), and those involving "trade secrets and commercial of financial information obtained from a person and privileged or confidential" (5 U.S.C. 552b.(c)(4)).

Accordingly, the Deputy Assistant Secretary of Defense (Civilian Personnel Policy) hereby determines that all portions of the meeting will be closed to the public because the matters considered are related to the internal rules and practices of the Department of Defense (5 U.S.C. 552b.(c)(2)), and the detailed wage data considered by the Committee during its meetings have been obtained from officials of private establishments with a guarantee that the

data will be held in confidence (5 U.S.C. 1552b(c)(4)).

However, members of the public who may wish to do so are invited to submit material in writing to the chairman concerning matters believed to be deserving of the Committee's attention.

Additional information concerning this meeting may be obtained by writing the Chairman, Department of Defense Wage Committee, Room 3D264, The Pentagon, Washington, DC 20301.

April 6, 1989.

L.M. Bynum,

*Alternate OSD Federal Register Liaison Officer, Department of Defense.*

[FR Doc. 89-8511 Filed 4-10-89; 8:45 am]

BILLING CODE 3810-01-M

**Defense Science Board 1989 Summer Study on National Space Launch Strategy**

**ACTION:** Notice of Advisory Committee Meetings.

**SUMMARY:** The Defense Science Board 1989 Summer Study on National Space Launch Strategy will meet in closed session on May 4-5 and June 7-8, 1989 at Science Applications International Corp., Falls Church, Virginia.

The mission of the Defense Science Board is to advise the Secretary of Defense and the Under Secretary of Defense for Acquisition on scientific and technical matters as they affect the perceived needs of the Department of Defense. At these meetings the Task Force will review the US national security space launch strategy.

In accordance with section 10(d) of the Federal Advisory Committee Act, Pub. L. No. 92-463, as amended (5 U.S.C. App. II, (1982)), it has been determined that these DSB Task Force meetings, concern matters listed in 5 U.S.C. 552b(c)(1) (1982), and that accordingly these meetings will be closed to the public.

April 6, 1989.

Linda M. Bynum,

*Alternate OSD Federal Register Liaison Officer, Department of Defense.*

[FR Doc. 89-8512 Filed 4-10-89; 8:45 am]

BILLING CODE 3810-01-M

**Department of the Navy****Privacy Act of 1974; New Record System**

**AGENCY:** Department of the Navy (U.S. Marine Corps), DOD.

**ACTION:** Notice of a new system of records subject to the Privacy Act.

**SUMMARY:** The U.S. Marine Corps is adding a new record system subject to the Privacy Act of 1974, as amended, (5 U.S.C. 552a).

**DATES:** This proposed action will be effective without further notice May 11, 1989, unless comments are received which would result in a contrary determination.

**ADDRESS:** Send any comments to Mrs. Barbara Thompson, PA/FOIA Coordinator, Headquarters, U.S. Marine Corps (Code MPI-10), Room 4327, Navy Annex, Washington, DC 20380-0001, telephone: 202-694-4008, autovon: 224-4008.

**SUPPLEMENTARY INFORMATION:** The U.S. Marine Corps systems of records notices inventory subject to the Privacy Act of 1974 have been published in the Federal Register as follows:

FR Doc 85-10237 (50 FR 22674) May 29, 1985

FR Doc 86-22610 (51 FR 35548) October 6, 1986

FR Doc 86-28837 (51 FR 45932) December 23, 1986

FR Doc 87-13559 (52 FR 22670) June 15, 1987

A new system report, as required 5 U.S.C. 552a(r) of the Privacy Act was submitted on March 31, 1989, pursuant to paragraph 4b of Appendix I to OMB Circular No. A-130, "Federal Agency Responsibilities for Maintaining Records About Individuals," dated December 12, 1985.

L.M. Bynum,

*Alternate OSD Federal Register Liaison Officer, Department of Defense.*

April 6, 1989.

MRS00003

**SYSTEM NAME:**

Marine Corps Reserve HIV Program.

**SYSTEM LOCATION:**

Headquarters, U.S. Marine Corps, (RESM-3), Washington, DC 20380-0001.

**CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:**

Members of the Marine Corps Ready Reserve infected with the Human Immunodeficiency Virus (HIV).

**CATEGORIES OF RECORDS IN THE SYSTEM:**

Medical records, notifications of HIV-positivity.

**AUTHORITY FOR MAINTENANCE OF THE SYSTEM:**

10 U.S.C. 5041 (as amended), 10 U.S.C. 5042, 5252, 44 U.S.C. 3101, 5 U.S.C. 301, and E.O. 9397.

**PURPOSE(S):**

To maintain a data base of all HIV-positive Marine Corps Reservists. The

system will be used to track all HIV-positive Reservists from the time they are identified as exposed to the HIV, to the time they are transferred to the Standby Reserve or discharged.

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

None outside the Department of Defense. The Blanket Routine Uses identified in the annual recompilation of Marine Corps system notices in the Federal Register do not apply to this system.

**POLICIES AND PRACTICES FOR RETRIEVING, STORING, RETAINING AND DISPOSING OF RECORDS IN THE SYSTEM:**

**STORAGE:**

Paper files are maintained in a locked filing cabinet. Additional information maintained in a Personal Computer (P/C).

**RETRIEVABILITY:**

Name and social security number.

**SAFEGUARDS:**

Paper files are maintained in locked filing cabinets. Access to the room where the P/C is maintained is monitored or controlled for access by authorized personnel only. Access to the automated records is through passwords and the room is locked when not monitored by authorized personnel. Building access is controlled by uniformed guards and doors are locked during non-duty hours.

**RETENTION AND DISPOSAL:**

Paper files are maintained for five years, then destroyed. Information contained in the P/C is maintained for 10 years after the individual's tenure with the Marine Corps and then destroyed.

**SYSTEM MANAGER(S) AND ADDRESS:**

Commandant of the Marine Corps, (Code RESM-3), Headquarters, U.S. Marine Corps, Washington, DC 20380-0001.

**NOTIFICATION PROCEDURES:**

Direct inquiries to the Commandant of the Marine Corps, (RESM-3), Washington, DC 20380-0001. Written inquiries should contain the name, social security number, date(s) of testing, military status and return address. Visitors should be able to identify themselves by any commonly recognized evidence of identity.

**RECORD ACCESS PROCEDURES:**

The agency's rules for access to records may be obtained from the Systems Manager.

**CONTESTING RECORD PROCEDURES:**

The agency's rules for contesting contents and appealing initial determinations by the individual concerned are contained in SECNAVINST 5211.5C (32 CFR Part 701, Subparts F and G) and may also be obtained from the systems manager.

**RECORD SOURCE CATEGORIES:**

Information is derived from the individual's service medical and dental records.

**EXEMPTIONS CLAIMED FOR THE SYSTEM:**

None.

[FR Doc. 89-8513 Filed 4-10-89; 8:45 am]

BILLING CODE 3810-01-M

**Privacy Act of 1974; Four New Records Systems**

**AGENCY:** Department of the Navy, DOD.

**ACTION:** Notice of four new systems of records subject to the Privacy Act.

**SUMMARY:** The Department of the Navy is adding four new record systems subject to the Privacy Act of 1974, as amended, (5 U.S.C. 552a).

**DATE:** This proposed action will be effective without further notice May 11, 1989, unless comments are received which would result in a contrary determination.

**ADDRESS:** Send any comments to Mrs. Gwen Aitken, Head, PA/FOIA Branch, Office of the Chief of Naval Operations (OP-09B30), Room 5E521, Department of the Navy, The Pentagon, Washington, DC 20350-2000, telephone: 202-697-1459, autovon: 227-1459.

**SUPPLEMENTARY INFORMATION:** The Department of the Navy systems of records notices inventory subject to the Privacy Act of 1974 have been published in the Federal Register as follows:

(51 FR 12908) April 16, 1986  
 (51 FR 18086) May 16, 1986 (Compilation)  
 (51 FR 19884) June 3, 1986  
 (51 FR 30377) August 26, 1986  
 (51 FR 30393) August 26, 1986  
 (51 FR 45931) December 23, 1986  
 (51 FR 2147) January 20, 1987  
 (51 FR 2149) January 20, 1987  
 (51 FR 8500) March 18, 1987  
 (51 FR 15530) April 29, 1987  
 (51 FR 22671) June 15, 1987  
 (51 FR 45846) December 2, 1987  
 (51 FR 17240) May 16, 1988  
 (51 FR 21512) June 8, 1988  
 (51 FR 22028) June 13, 1988  
 (51 FR 25363) July 6, 1988  
 (51 FR 39499) October 7, 1988  
 (51 FR 41224) October 20, 1988

New systems reports, as required by 5 U.S.C. 552a(r) of the Privacy Act were submitted on March 31, 1989, pursuant to paragraph 4b of Appendix I to OMB

Circular No. A-130, 'Federal Agency Responsibilities for Maintaining Records About Individuals,' dated December 12, 1985.

L.M. Bynum,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

April 6, 1989.

**N02060-1**

**SYSTEM NAME:**

PWC Subic Residential Telephone Billing.

**SYSTEM LOCATION:**

U.S. Navy Public Works Center, Subic Naval Facility, Subic Bay, Republic of the Philippines, Box 6, FPO San Francisco 96651-2900.

**CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:**

All current civilian and military residential subscribers of the PWC Subic Bay Telephone System located in the Republic of the Philippines; and past subscribers who have outstanding unpaid accounts.

**CATEGORIES OF RECORDS IN THE SYSTEM:**

Individual's name; SSN; residential phone number; office phone number; rank or grade level; official and residential addresses; type and number of instruments/service provided; financial charges accrued and paid; and long distance calls made.

**AUTHORITY FOR MAINTENANCE OF THE SYSTEM:**

Pub. L. 97-365; Pub. L. 89-508; Title 5 U.S.C. 5584; Title 5 U.S.C. 5514; DOD Directives 4640.3; 4640.4 and 7045.13; and E.O. 9397.

**PURPOSE(S):**

To manage, process and collect funds from residential users of the PWC Subic Bay Telephone System, Republic of the Philippines.

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

The Blanket Routine Uses that appear at the beginning of the Navy's listing of the system notices apply to this system.

**POLICIES AND PRACTICES FOR RETRIEVING, STORING, RETAINING AND DISPOSING OF RECORDS IN THE SYSTEM:**

**STORAGE:**

Records are maintained in computer software files as well as hard copy forms.

**RETRIEVABILITY:**

Information is accessed via hard copy files, and retrieved by SSN, telephone number and/or individual's name.

**SAFEGUARDS:**

Access to building is restricted to guards during other than normal business hours. Files and building are locked except during normal business hours.

**RETENTION AND DISPOSAL:**

Individual files are maintained for two years after close of account, then destroyed.

**SYSTEM MANAGER AND ADDRESS:**

Commanding Officer, U.S. Navy Public Works Center, Box 6, FPO San Francisco 96651-2900.

**NOTIFICATION PROCEDURES:**

Information should be obtained from the system manager. Requesting individuals should specify their full name and telephone number. Visitors should be able to identify themselves by any commonly recognized evidence of identity. Written requests must be signed by the requesting individual.

**RECORD ACCESS PROCEDURES:**

The agency's rules for access to records may be obtained from the systems manager.

**CONTESTING RECORD PROCEDURES:**

The agency's rules for contesting contents and appealing initial determinations by the individual concerned are contained in SECNAVINST 5211.5C (32 CFR Part 701, Subparts F and G).

**RECORD SOURCE CATEGORIES:**

Information in this system is provided by the individual concerned, telephone billing office and the long distance telephone billing office.

**EXEMPTIONS CLAIMED FOR THE SYSTEM:**

None.

**NO3501-2****SYSTEM NAME:**

Navy Recovery Data Base System.

**SYSTEM LOCATION:**

Primary location—Commander, Naval Facilities Engineering Command (Code 0622), Department of the Navy, 200 Stovall Street, Alexandria, VA 22332.

Secondary System—Principal Planning Agents are the Commander in Chief, U.S. Pacific Fleet, Pearl Harbor, HI 96860-7000 and Commander in Chief, U.S. Atlantic Fleet, Norfolk, VA 23511-6001. The Regional Planning Agents are the Commander, Naval Base, Seattle,

WA 98115-5012, the Commandant Naval District Washington, Washington Navy Yard, Washington, DC 20374-2002; the Commander, Naval Base San Francisco, Naval Station, Treasure Island, San Francisco, CA 94130-5018; the Commander, Naval Base, 937 North Harbor Drive, San Diego, CA 93132-5100; the Commander, Naval Base, Box 110, Pearl Harbor, HI 96860; the Commander, Naval Base, Philadelphia, PA 19112-5098; the Commander, Naval Base, Norfolk, VA 23511-6002; the Commander, Naval Training Center, Bldg. 1, Great Lakes, IL 60088-5026; the Chief of Naval Air Training, Naval Air Station, Corpus Christi, TX 78419-5100 and the Commander, Naval Base, Charleston, SC 29408-5100.

**CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:**

Selected Naval Reserve Officers assigned to appropriate civil/military headquarters to represent Department of the Navy (DON) planning agents in planning and coordinating DON assistance to civil authorities in civil emergencies/disasters.

**CATEGORIES OF RECORDS IN THE SYSTEM:**

Names, home addresses and telephone numbers of Navy Reserve Officers currently assigned to the program.

**AUTHORITY FOR MAINTENANCE OF THE SYSTEM:**

5 U.S.C. 301

**PURPOSE(S):**

To assist in the operation and administration of the Department of the Navy Civil Disaster Assistance Program.

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

The Blanket Routine Uses that appear at the beginning of the Department of Navy's listing of record systems apply to this system.

**POLICIES AND PRACTICES FOR STORING, RETRIEVING, ACCESSING, RETAINING, AND DISPOSING OF RECORDS IN THE SYSTEM:****STORAGE:**

The media in which these records are stored vary; but include magnetic disks and file copies.

**RETRIEVABILITY:**

Automated records may be retrieved by name or area of responsibility.

**SAFEGUARDS:**

Records are available only to authorized personnel having a need to know through the use of access codes and encrypted data.

**RETENTION AND DISPOSAL:**

Records on Navy Reserve Officers are retained only for their tour of duty while assigned to the program and superceded data removed from the system or destroyed.

**SYSTEM MANAGER(S) AND ADDRESS:**

Commander, Naval Facilities Engineering Command (FAC 0622), Department of the Navy, 200 Stovall Street, Alexandria, VA 22332-2300.

**NOTIFICATION PROCEDURE:**

Requests from individuals should be addressed to the systems manager. Requests received by mail must be accompanied by the individual's full name and a statement verifying the requester's identity. Requesters may also inquire in person at the naval base or station. In such case, proof of identity will consist of full name and a positive piece of identification such as a driver's license or DOD ID card.

**RECORD ACCESS PROCEDURES:**

The agency's rules for access to records may be obtained from the systems manager.

**CONTESTING RECORD PROCEDURES:**

The agency's rules for contesting contents and appealing initial determinations by the individual concerned are contained in SECNAVINST 5211.5C (32 CFR Part 701 Subparts F and G).

**RECORD SOURCE CATEGORIES:**

The information is supplied by the Naval Reserve Officer upon his/her assignment to the program.

**EXEMPTIONS CLAIMED FOR THE SYSTEM:**

None.

**NO4066-5****SYSTEM NAME:**

NAVRESSO Direct Mail List

**SYSTEM LOCATION:**

Commander, Navy Resale and Services Support Office, Naval Station New York-State Island, Staten Island, New York 10305

**CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:**

All authorized customers of military resale systems who have requested receipt of sales promotional, informational and marketing research materials.

**CATEGORIES OF RECORDS IN THE SYSTEM:**

For each authorized customer: Name, address, rank, branch of service, status (active or retired), social security

number, pay grade, age, sex, race, number, names, and birth dates of dependents, date of sign up, telephone number (if available), account number, rotation date (if available), mailings sent to customers and responses available.

**AUTHORITY FOR MAINTENANCE OF THE SYSTEM:**

5 U.S.C. 301; 10 U.S.C. 6011; and Executive Order 9397.

**PURPOSE(S):**

To maintain a data base which will permit the Navy Exchange Program to mail sales promotional, informational and market research materials to those authorized customers who have requested receipt of materials. The data base will also be used to define target markets among the authorized customers who sign up for the list, in order to develop better merchandise assortments and services to meet the needs of the customers. The social security number is required in this system to verify that the individual requesting receipt of materials is an authorized customer of the military resale systems.

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

The Blanket Routine Uses that appear at the beginning of the Department of the Navy's listing of record systems apply to this system.

**POLICIES AND PRACTICES FOR STORING, RETRIEVING, ACCESSING, RETAINING, AND DISPOSING OF RECORDS IN THE SYSTEM:**

**STORAGE:**

The records are stored on computer tape in a single location.

**RETRIEVABILITY:**

Name, social security number, address and account number.

**SAFEGUARDS:**

Secured and supervised facility, access restricted.

**RETENTION AND DISPOSAL:**

The records are retained as long as the customer wishes to receive the materials, then the records are destroyed by the Navy Resale and Services Support Office.

**SYSTEM MANAGER(S) AND ADDRESS:**

Policy Official: Commander, Navy Resale and Services Support Office, Naval Station New York—Staten Island, Staten Island, New York 10305-5097

Record Holder Manager: Deputy Commander, Marketing Communications Division (MCD), Navy Resale and Services Support Office,

Naval Station New York—Staten Island, Staten Island, New York 10305-5097.

**NOTIFICATION PROCEDURES:**

Written contact may be made by addressing inquiries to: Commander, Navy Resale and Services Support Office, Naval Station New York—Staten Island, Staten Island, New York 10305-5097.

**RECORD ACCESS PROCEDURES:**

The agency's rules for access to records may be obtained from the systems manager.

**CONTESTING RECORD PROCEDURES:**

The agency's rules for contesting contents and appealing initial determinations by the individual concerned are contained in SECNAVINST 5211.5C (32 CFR Part 701, Subparts F and G).

**RECORD SOURCE CATEGORIES:**

The individual authorized customer and the Department of Defense (DOD)/ Defense Enrollment Eligibility Reporting System (DEERS).

**EXEMPTIONS CLAIMED FOR THE SYSTEM:**

None.

**NO5300-7**

**SYSTEM NAME:**

Bases and Stations Information System (BASIS)

**SYSTEM LOCATION:**

Decentralized, maintained by individual Naval bases and stations. Official mailing addresses are in the Navy's address directory in the appendix to the Navy Department's systems notices appearing in the *Federal Register*. Included in this notice are those records duplicated for maintenance at a site closer to where the employee works (e.g., in an administrative office or a supervisor's work area).

**CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:**

Records of present and former and prospective military, civilian and contractor personnel located at Naval bases and stations.

**CATEGORIES OF RECORDS IN THE SYSTEM:**

Correspondence/records concerning identification; location (assigned organization code and/or work center code); labor code; payments for training; travel advances and claims; hours assigned and worked; routine and emergency assignments; functional responsibilities; clearances; educational and experience characteristics and training histories; travel; retention

group; hire/termination dates; types of appointment; leave; trade; vehicle parking; disaster control; community relations (blood donor, etc.); employee recreational programs; grades and series or rank/rate; retirement category; awards; property custody; personnel actions/dates; violations of rules; physical handicaps and health data; veterans preference; postal address; location of dependents, next of kin and their addresses and other data needed for personnel, financial, safety security management, as appropriate.

**AUTHORITY FOR MAINTENANCE OF THE SYSTEM:**

5 U.S.C. 301 and Executive Order 9397

**PURPOSE(S):**

The Naval bases and stations use this data to manage their landlord functions such as to locate individuals; determine security clearances for access levels; track safety incidents; provide career counseling; track traffic accidents and incidents, complaints, and arrest information; record handlers of hazardous materials; record rental of welfare and recreational equipment; track individuals' training; record family or individual counseling; determine personnel data such as pay status, date reported aboard, separation data, and dependents; emergency information, i.e., next of kin; to track beneficial suggestions and other awards; monitor employee/labor relation actions; maintain non-appropriated fund employee information; and any other pertinent employee information necessary to operate the landlord functions of a base or station.

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

The Blanket Routine Uses that appear at the beginning of the Department of the Navy's listing of record system notices apply to this system.

**POLICIES AND PRACTICES FOR STORING, RETRIEVING, ACCESSING, RETAINING, AND DISPOSING OF RECORDS IN THE SYSTEM:**

**STORAGE:**

Data is stored on electronic medium which includes disks, tapes and diskettes.

**RETRIEVABILITY:**

SSN, name, organization, work center or job order

**SAFEGUARDS:**

Access is limited to officials/ employees of the command who have a need to know. There are three levels of electronic controls: (1) Access to BASIS

is controlled by password, (2) levels of access within the system are controlled by the operating system security procedures for individual permissions based upon passwords, (3) access to specific data element information is password controlled by the data dictionary of the data base management system.

**RETENTION AND DISPOSAL:**

Records are retained for the period the individual is assigned to the base or station and deleted after six months of departure.

**SYSTEM MANAGER(S) AND ADDRESS:**

Decentralized, maintained by individual Naval bases and stations. Mailing addresses are provided in the Navy Department Directory published in the appendix of the record system notices published in the **Federal Register**.

**NOTIFICATION PROCEDURES:**

Requests from individuals should be addressed to the systems manager. Requests received by mail must be accompanied by the individual's full name and social security number and a statement verifying the requester's identity. Requesters may also inquire in person at the naval base or station. In such case, proof of identity will consist of full name, social security number, and a positive piece of identification such as a driver's license or Department of Defense ID card.

**RECORD ACCESS PROCEDURES:**

The agency's rules for access to records may be obtained from the systems manager.

**CONTESTING RECORD PROCEDURES:**

The agency's rules for contesting contents and appealing initial determinations by the individual concerned are contained in SECNAVINST 5211.5C (32 CFR Part 701, Subparts F and G).

**RECORD SOURCE CATEGORIES:**

Information obtained from individuals, official documents generated on the base or station, and from electronic interfaces with other standard Navy systems (e.g., NCPDS, PASS/SDS, etc.). The electronic interfaces to BASIS are dependent upon which standard Navy systems are installed at an individual activity. A list of these interfaces can be obtained from the systems manager.

**EXEMPTIONS CLAIMED FOR THE SYSTEM:**

None.

[FR Doc. 89-8514 Filed 4-10-89; 8:45 am]

BILLING CODE 3810-01-M

**DEPARTMENT OF ENERGY**

**Office of Fossil Energy**

[ERA Docket No. 89-08-NG]

**ICG Energy Marketing, Inc.**

**Granting of Extension of Blanket Authorization To Import Natural Gas**

**AGENCY:** Office of Fossil Energy, Department of Energy.

**ACTION:** Notice of an Order Granting Extension of Blanket Authorization To Import Natural Gas.

**SUMMARY:** The Office of Fossil Energy (FE) of the Department of Energy (DOE) gives notice that it has issued an order granting ICG Energy Marketing, Inc. (ICG Energy), an extension of its existing blanket authorization to import natural gas from Canada and an increase in the maximum volumes. The order issued in ERA Docket No. 89-08-NG authorizes ICG Energy to import up to 72 Bcf of gas over a two-year period commencing April 1, 1989, through March 31, 1991, for sale in the domestic spot market.

A copy of this order is available for inspection and copying in the Office of Fuels Programs Docket Room, 3F-056, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-9478. The docket room is open between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays.

Issued in Washington, DC, March 31, 1989.

J. Allen Wampler,

*Assistant Secretary, Fossil Energy*

[FR Doc. 89-8505 Filed 4-10-89; 8:45 am]

BILLING CODE 6450-01-M

**Energy Information Administration**

**Electric Power Survey Forms**

**AGENCY:** Energy Information Administration, Department of Energy.

**ACTION:** Solicitation of comments concerning the proposed revision and extension of electric power survey forms.

**SUMMARY:** As part of a continuing effort to reduce paperwork and respondent burden (required by the Paperwork Reduction Act of 1980), the Energy Information Administration (EIA) of the Department of Energy (DOE) conducts a consultation program to provide the general public with an opportunity to comment on data reporting forms. This program ensures that requested data can be provided in the desired format, reporting burden is minimized, reporting

forms are clearly understood, and the impact of collection requirements on respondents can be properly assessed. This notice solicits comments on the proposed extension for 3 years of six electric power survey forms and the addition of an annual supplement to one monthly survey. The forms to be extended are listed below. Some will also have changes as explained later in this notice.

- Form EIA-213, "Typical Net Monthly Bills;"
- Form EIA-412, "Annual Report of Public Electric Utilities;"
- Form EIA-759, "Monthly Power Plant Report;"
- Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions;"
- Form EIA-860, "Annual Electric Generator Report;" and
- Form EIA-861, "Annual Electric Utility Report."

The EIA proposes to develop a statistical design for the "Monthly Power Plant Report" (Form EIA-759) to collect net generation, fuel consumption, and fuel stock data from a sample of electric utilities that generate electricity. This sample will replace a census of all electric generating utilities. The EIA further proposes to add an annual supplement to the Form EIA-759. The Form EIA-759A, "Monthly Power Plant Report (Annual Supplement)," is designed to collect net generation, fuel consumption, and fuel stock data on an annual basis from the balance of the electric utilities not included in the monthly survey.

**DATE:** Written comments must be submitted on or before May 11, 1989.

**ADDRESS:** Send written comments to Neal Moerschel (E1-541), Energy Information Administration, Department of Energy, Mail Stop: 2C-090, 1000 Independence Avenue, SW., Washington, DC 20585. Telephone (202) 586-6516.

**FOR FURTHER INFORMATION:** Requests for additional information, or additional copies of the forms and instructions should be directed to Mr. Moerschel at the address above.

**SUPPLEMENTARY INFORMATION:**

- I. Background
- II. Current Actions
- III. Request for Comments

**I. Background**

In order to fulfill its responsibilities under the Federal Energy Administration Act of 1974 (Pub. L. 93-275) and the Department of Energy (DOE) Organization Act (Pub. L. 95-91), the Energy Information Administration

(EIA) is obliged to publish, and otherwise make available to the public, high-quality statistical data that reflect current and prospective national and regional electric power supply and demand activity as accurately as possible. To meet this responsibility, as well as the internal DOE requirements that are dependent on accurate data, the EIA is tasked to conduct surveys that encompass every major electric power supply and demand activity in the United States.

## II. Current Actions

The EIA proposes the following changes and improvements:

- Deleting data items no longer required;
- Adding data items for analysis;
- Improving the clarity of the instructions;
- Improving the design of the forms; and
- Extending the application of sampling methodologies.

These change will reduce respondent burden as a whole and continue to meet the data requirements of the Congress, Federal agencies, and the public. The proposed changes and additions to the surveys are summarized as follows:

### 1. Form EIA-213

None.

### 2. Form EIA-412

a. Part I, "Balance Sheet," Part II, "Income Statement for the Year," and Part III, "Operation and Maintenance Expenses," will reflect only electric utility activities. The name for each of these parts has been changed to "Electric Utility Balance Sheet," "Electric Utility Income Statement for the Year," and "Electric Utility Operation and Maintenance Expenses."

b. In Part III, "Operation and Maintenance Expenses," the data item, "Customer Service and Information Expenses," has been added. Fuel as part of operation expenses is requested for steam-, nuclear-, and other-powered generation for utility level analysis.

c. Part IV, "Utility Plant," data for other utility departments such as gas and water will not be collected. The name for this part has been changed to "Electric Utility Plant."

d. Part IX, "Sources of Generation," has been added to the form. This was part of the "Electric Energy Account" that was used in the survey prior to 1987. Six of the 22 data items are now considered necessary for utility level analysis of generation (i.e. levelized cost of generation by prime mover) in the electric power industry.

e. In Part X (formerly Part V), "Sales of Electricity for Resale," the data item, "Revenues Per Kilowatthour," has been eliminated.

f. In Part V (formerly Part VI), "Purchased Power," the data item, "Cost Per Kilowatthour," has been eliminated and the data item, "Type of Purchase," added. The revised format is identical to Part IX, "Sales of Electricity for Resale." The instructions for both parts have been revised for clarity of reporting.

g. In Part VII (formerly Part VIII), "Large-Electric Generating Plants Using Fuel" and Part VIII (formerly Part IX), "Hydroelectric Generating Plant Statistics," the two data elements relating to plant capability have been eliminated; capacity data are retained. The data element, "Gross Annual Capital Expenditures," was added to both parts.

h. For applicable line items, the reference number to the Uniform System of Accounts has been added.

i. The form has been redesigned to improve readability and to expand the space for reporting data.

### 3. Form EIA-759

a. A statistical sampling technique has been developed for collecting net generation, fuel consumption, and fuel stock data from plants that generate electricity. Data are currently collected monthly from a universe of approximately 900 electric utilities. It is estimated that the new sample will reduce the number of respondents by about 50 percent. Generation, fuel consumption and fuel stock data will be collected on an annual basis from the balance of the electric utilities in the universe using the new Form EIA-759A.

b. The instructions have been modified to require respondents to begin reporting data when fuel stocks are on hand rather than when they begin to generate electricity. This change is important to the reconciliation of fuel receipts with consumption and fuel stocks.

c. The instructions have also been revised to require the reporting of generation data when a generator is in a standby status. This revision was made in order to capture intermittent generation during a month from generators classified in a standby status.

d. The instructions have also been expanded. The additional instructions were developed from an analysis of common errors made by respondents and are intended to improve the quality of the data submitted.

e. The word "unit" in the instructions has been replaced by the word "generator."

f. The form has been redesigned to improve readability, and a column has been added to require the respondent to indicate any unusual values or occurrences in the data between monthly submissions in order to eliminate respondent followup. The respondent is also asked to provide an explanation of any unusual occurrences.

### 4. Form EIA-759A

The EIA proposes the Form EIA-759A, "Monthly Power Plant Report (Annual Supplement)," in order to collect net generation, fuel consumption, and fuel stock data on an annual basis from the balance of electric utilities not included in the Form EIA-759 monthly survey. This form will facilitate capturing plant data from a complete census of electric generating utilities. Besides publication of these data, the annual census will be used to choose the electric utilities to be included in the Form EIA-759 sample for the following year.

### 5. Form EIA-826

a. The form has been revised. Only State totals will be requested for sales and revenue. Company totals for these categories have been eliminated. Data for "Depreciation and Amortization," "Allowance for Funds Used During Construction," "Net Income," and "Construction Work in Progress" will be required by company totals only.

b. Collection of data for "Sales for Resale," "Total Sales of Electric Energy," "Number of Customers," and "Other Electric Revenue" has been eliminated.

c. The form has also been redesigned for clarity and readability. Some of the information on the form will be preprinted to aid the respondent in completing the survey.

d. The instructions have been expanded to clarify reporting.

e. The time of submission has been changed from 40 days after the reporting month to the last day of the month following the reporting month.

### 6. FORM EIA-860

Schedule III has been modified so that respondents will use defined codes to identify electric generating units that are proposed for life extension or for repowering.

### 7. FORM EIA-861

a. Schedule V, "Electric Utility Ownership Information," has been eliminated.

b. Schedule VI, "Nonutility Power Producer Information," is now Schedule V Question 3 of Schedule V has been modified to require data on firm power



requirements to be provided to the reporting electric utility by nonutility electric power producers. These data will be required for each of the five years after the reporting year.

c. The instructions have been expanded to clarify reporting.

### III. Request for Comments

The EIA invites the public to comment on these proposed extensions and changes within 30 days of the publication of this notice. The following guidelines are provided to assist in the preparation of responses. When providing comments, please indicate the form(s) to which each comment applies.

#### As a potential respondent

A. Are the instructions and definitions clear and sufficient? If not, which instructions require clarification?

B. Can the data be submitted using the definitions included in the instructions?

C. Can the data be submitted in accordance with the response time specified in the instructions?

D. How many hours, including time for preparation and administrative review, will you require to complete and submit the required form(s)? Public reporting burden (estimated average hours per response) for the electric power surveys is listed below.

EIA survey form	Burden hours per response
EIA-213 .....	5.8
EIA-412 .....	31.8
EIA-759 .....	1.4
EIA-759A .....	1.4
EIA-826 .....	1.8
EIA-860 .....	16.1
EIA-861 .....	6.6

E. What is the estimated cost to complete the form(s), including the direct and indirect costs associated with the data collection? Direct costs should include all costs, such as administrative, development, assembly, equipment, automatic data processing, and any other one-time or recurring costs directly attributable to providing this information.

F. How can the form(s) be improved?

G. Do you know other Federal, State, or local agencies that collect similar data? If yes, specify the agency, the data elements, and the means of collection.

#### As a potential data user

A. Can you use the data at the levels of detail indicated on the form(s)?

B. For what purpose would you use the data? Be specific.

C. How could the form(s) be improved to better meet your specific needs?

D. Are there alternate sources of data and do you use them? What are their deficiencies and/or strengths?

The EIA is also interested in receiving comments from persons regarding their views on the need for the collection of the new information contained in the electric power surveys. Comments submitted in response to this notice will be summarized and/or included in the request for the Office of Management and Budget approval of these data surveys and will become a matter of public record. Depending on the magnitude and substance of the comments received, formal meetings may be held to review them for incorporation in the appropriate data survey. Commenters will be notified of the date, time, and location of any meetings that are scheduled to be held.

**Statutory Authority:** Sections 5(a), 5(b), 13(b), and 52 of Pub. L. 93-275, Federal Energy Administration Act of 1974, as amended, 15 U.S.C. sections 764(a), 764(b), 772(b), and 790(a).

Issued in Washington, DC on April 5, 1989.

**Yvonne M. Bishop,**

*Director, Statistical Standards Energy Information Administration.*

[FR Doc. 89-8506 Filed 4-10-89; 8:45 am]

**BILLING CODE 6450-01-M**

## Federal Energy Regulatory Commission

[Docket Nos. CP89-1080-000 et al.]

### ANR Pipeline Co. et al.; Natural Gas Certificate Filings

Take notice that the following filings have been made with the Commission:

#### 1. ANR Pipeline Company

[Docket No. CP89-1080-000]

April 3, 1989.

Take notice that on March 24, 1989, ANR Pipeline Company (ANR), 500 Renaissance Center, Detroit, Michigan 48243, filed in Docket No. CP89-1080-000 a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) and the Natural Gas Policy Act (18 CFR 284.223) for authorization to transport natural gas for Amoco Production Company (Amoco), a marketer of natural gas, under ANR's blanket certificate issued in Docket No. CP88-532-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

ANR proposes to transport up to 38,000 dekatherms (Dkt) of natural gas equivalent per day on an interruptible

basis on behalf of Amoco pursuant to a transportation agreement dated October 1, 1988, between ANR and Amoco. ANR would receive the gas at an existing point of receipt in ANR's offshore Texas gathering area and deliver equivalent volumes at an existing point of delivery in the offshore Texas area.

ANR states that the estimated daily and annual quantities would be 38,000 dkt and 13,870,000 dkt, respectively. Service under § 284.223(a) commenced on February 1, 1989, as reported in Docket No. ST89-2538-000, it is stated.

Comment date: May 18, 1989 in accordance with Standard Paragraph G at the end of this notice.

#### 2. Columbia Gas Transmission Corporation

[Docket No. CP89-1087-000]

April 3, 1989.

Take notice that on March 27, 1989, Columbia Gas Transmission Corporation (Columbia), 1700 MacCorkle Avenue, S.E., Charleston, West Virginia 25314, filed in Docket No. CP89-1087-000, a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations under the Natural Gas Act for authorization to transport natural gas under the blanket certificate issued in Docket No. CP86-240-000, pursuant to section 7(c) of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

Columbia proposes to transport natural gas on an interruptible basis for Quivira Gas Company (Quivira). Columbia explains that service commenced January 1, 1989 under § 284.223(a) of the Commission's Regulations, as reported in Docket No. ST89-2051-000. Columbia further explains that the peak day quantity would be 50,000 MMBtu, the average daily quantity would be 40,000 MMBtu, and that the annual quantity would be 18,250,000 MMBtu.

Comment date: May 18, 1989 in accordance with Standard Paragraph G at the end of this notice.

#### 3. Columbia Gas Transmission Corporation

[Docket No. CP89-1088-000]

April 3, 1989.

Take notice that on March 27, 1989, Columbia Gas Transmission Corporation (Columbia), 1700 MacCorkle Avenue, S.E., Charleston, West Virginia 25314, filed in Docket No. CP89-1088-000, a request pursuant to § 157.205 of the Commission's Regulations for authorization to provide

transportation service on behalf of Gulf Ohio Corporation (Gulf Ohio) under Columbia's blanket certificate issued in Docket No. CP86-240-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

Columbia requests authorization to transport, on an interruptible basis, up to a maximum of 5,000 MMBtu of natural gas per day for Gulf Ohio from various receipt points located on Columbia's pipeline system to delivery points located in Ohio and New York. Columbia anticipates transporting, on an average day 4,000 MMBtu and an annual volume of 1,825,000 MMBtu.

Columbia states that the transportation of natural gas for Gulf Ohio commenced November 29, 1988, as reported in Docket No. ST89-1275-000, for a 120-day period pursuant to § 284.223(a) of the Commission's Regulations and the blanket certificate issued to Columbia in Docket No. CP86-240-000.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice

#### 4. Natural Gas Pipeline Company of America

[Docket No. CP89-1105-000]

April 3, 1989.

Take notice that on March 29, 1989, Natural Gas Pipeline Company of America (Natural), 701 East 22nd Street, Lombard, Illinois 60148, filed in Docket No. CP89-1105-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to provide an interruptible transportation service for ARCO Oil and Gas Company, Division of Atlantic Richfield Company (ARCO), a producer, under the blanket certificate issued in Docket No. CP86-582-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request that is on file with the Commission and open to public inspection.

Natural states that pursuant to a transportation agreement dated November 3, 1988, under its Rate Schedule ITS, it proposes to transport up to 150,000 MMBtu per day equivalent to natural gas for ARCO. Natural states that it would transport the gas from receipt points in Louisiana, offshore Louisiana, Texas, offshore Texas and Oklahoma, and deliver the gas to a delivery point located in Wisconsin.

Natural advises that service under § 284.223(a) commenced February 1, 1989, as reported in Docket No. ST89-2827-000. Natural further advises that it

would transport 30,000 MMBtu on an average day and 10,950,000 MMBtu annually.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 5. Northwest Pipeline Company

[Docket No. CP89-1085-000]

April 3, 1989.

Take notice that on March 17, 1989, Northwest Pipeline Corporation (Northwest), 295 Chipeta Way, Salt Lake City, Utah 84108, filed in Docket No. CP89-1085-000, a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations under the Natural Gas Act for authorization to transport natural gas under its blanket certificate issued in Docket No. CP86-578-000 pursuant to section 7 of the Natural Gas Act for J. C. Thompson (Thompson), a producer, as more fully set forth in the request on file with the Commission and open to public inspection.

Northwest proposes to transport up to a maximum of 3,500 MMBtu of natural gas per day for Thompson from various receipt points in Colorado, Oklahoma, Oregon, Utah, Washington, and Wyoming, to various delivery points in Colorado, Idaho, New Mexico, Oklahoma, Oregon, Utah, Washington, and Wyoming.

Northwest anticipates transporting up to 3,500 MMBtu on a peak day and 20 MMBtu on an average day and up to 7,000 MMBtu annually. Northwest explains that service commenced February 17, 1989, under § 284.223(a) of the Commission's regulations, as reported in Docket No. ST89-2720-000.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 6. Southern Natural Gas Company

[Docket No. CP89-1113-000]

April 3, 1989

Take notice that on March 30, 1989, Southern Natural Gas Company (Southern), P.O. Box 2563, Birmingham, Alabama 35202-2563, filed in Docket No. CP89-1113-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to provide an interruptible transportation service for Texas-Ohio Gas, Inc. (Texas-Ohio), a producer, under the blanket certificate issued in Docket No. CP88-316-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request that is on file with the Commission and open to public inspection.

Southern states that pursuant to a service agreement dated February 1, 1989, under its Rate Schedule IT, it proposes to transport up to 1,400 MMBtu per day equivalent of natural gas for Texas-Ohio. Southern states that it would transport the gas from various receipt points in Louisiana, offshore Louisiana, Texas, offshore Texas, Mississippi and Alabama, and would deliver the gas to various points in Georgia.

Southern advises that service under § 284.223(a) commenced February 2, 1989, as reported in Docket No. ST89-2437. Southern further advises that it would transport 1,400 MMBtu on an average day and 511,000 MMBtu annually.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 7. United Gas Pipe Line Company

[Docket No. CP89-1069-000]

April 3, 1989

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77251-1478, filed in Docket No. CP89-1069-000 a request pursuant to § 157.205 of the Commission's Regulations for authorization to construct and operate a sales tap for the delivery of natural gas to Mississippi Valley Gas Company (MVGC) under United's blanket certificate issued in Docket No. CP82-430-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

United proposes to install the tap on its 18-inch line in Hinds County, Mississippi. It is stated that United would utilize the tap for the delivery of up to 3,633 Mcf on a peak day and 403,038 Mcf on an annual basis to MVGC, a local distribution company for resale to residential customers in the Raymond, Mississippi area. It is asserted that United would be reimbursed for construction costs by MVGC. It is further asserted that the deliveries would be within MVGC's daily entitlement from United.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of the notice.

#### 8. United Gas Pipe Line Company

[Docket No. CP89-1072-000]

April 3, 1989

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77251-1478, filed in Docket No. CP89-1072-000

a request pursuant to §§ 157.205 and 157.211 (18 CFR 157.205 and 157.211) of the Commission's Regulations under the Natural Gas Act for authority to construct and operate a pipeline tap for resale of gas for the account of Entex, a local distribution company, to an industrial customer and five residential or commercial customers pursuant to United's blanket certificate which was issued by Commission order on September 1, 1982, in Docket No. CP82-430-000, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

United proposes to install a two inch sales tap on a lateral off the Jackson-Mobile 16 inch transmission pipeline in Smith County, Mississippi, for the delivery of gas for the account of Entex to Georgia Pacific Plywood, an industrial customer, and five residential/small commercial customers.

United indicates that it will deliver up to 2,519 Mcf on a peak day and approximately 146,803 Mcf of gas annually to Entex under United's Rate DG-N. United states these volumes are within the certificated contractual entitlements for the billing area.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of the notice.

#### 9. United Gas Pipe Line Company

[Docket No. CP89-1092-000]

April 3, 1989.

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77251-1478, filed in Docket No. CP89-1092-000 a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport gas on an interruptible basis for Enron Gas Marketing (Enron), under the blanket certificate issued in Docket No. CP88-6-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request on file with the Commission and open to public inspection.

United states that it proposes to transport for Enron 51,500 MMBtu on a peak day, 51,500 MMBtu on an average day and 18,787,500 MMBtu on an annual basis. United also states that pursuant to a Transportation Agreement dated August 23, 1988, between United and Enron (Transportation Agreement) proposes to transport natural gas for Enron from points of receipt located in various counties in Louisiana. The points of delivery and ultimate points of delivery are located in multiple states.

United further states that it commenced this service February 11, 1989, as reported in Docket No. ST89-2669-000.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 10. United Gas Pipe Line Company

[Docket No. CP89-1093-000]

April 3, 1989.

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77251-1478, filed in Docket No. CP89-1093-000 a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations for authorization to provide interruptible transportation service on behalf of Enron Gas Marketing, Inc., a marketer of natural gas, under United's blanket certificate issued in Docket No. CP88-6-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request on file with the Commission and open to public inspection.

United states that it would transport 515,000 MMBtu on a peak and average day and 18,975,000 MMBtu on an annual basis.

United further states that it has commenced service under the 120-day automatic authorization and reported such service in Docket No. ST89-2652, pursuant to § 284.223(a) of the Regulations.

Comment date: May 18, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 11. United Gas Pipe Line Company

[Docket No. CP89-1117-000]

April 4, 1989.

Take notice that on March 30, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77152-1478, filed in Docket No. CP89-840-000 an application pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport natural gas on behalf of Enron Gas Marketing, Inc. (Enron), a marketer of natural gas, under United's blanket certificate issued in Docket No. CP88-6-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

United proposes to transport, on an interruptible basis, up to 257,500 MMBtu per day for Enron. United states that construction of facilities would not be required to provide the proposed service.

United further states that the maximum day, average day, and annual transportation volumes would be

approximately 257,500 MMBtu, 257,500 MMBtu and 93,987,500 MMBtu respectively.

United advises that service under § 284.223(a) commenced September 24, 1988, as reported in Docket No. ST89-2705.

Comment date: May 19, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 12. Kansas Pipeline Company, L.P.

[Docket No. CP89-1066-000]

April 5, 1989.

Take notice that on March 23, 1989, Kansas Pipeline Company L.P. (Kansas Pipeline), a Hinshaw pipeline company, 520 college Oaks A, 11880 College Boulevard, Overland Park, Kansas 66210, filed in Docket No. CP89-1066-000 an application pursuant to §§ 284.224 of the Commission's Regulations for a blanket certificate of public convenience and necessity authorizing the transportation, sale and assignment of natural gas, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

Kansas Pipeline proposes to charge a maximum transportation rate of 60 cents per Mcf, discountable to a minimum transportation rate of 5 cents per Mcf, as approved by the State Corporation Commission of the State of Kansas.

Kansas Pipeline states that it would comply with § 284.224(e) of the Commission's Regulations.

Comment date: April 26, 1989, in accordance with Standard Paragraph F at the end of this notice.

#### 13. Northern Natural Gas Company, Division of Enron Corp.

[Docket No. CP89-1116-000]

April 5, 1989.

Take notice that on March 30, 1989, Northern Natural Gas Company, Division of Enron Corp. (Northern), 1400 Smith Street, P.O. Box 1188, Houston, Texas 77251-1188 filed in Docket No. CP89-1116-000 a request pursuant to § 157.205 of the Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport natural gas on behalf of Cibola Corp. (Cibola), under the authorization issued in Docket No. CP86-435-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

Northern would perform the proposed interruptible transportation service for Cibola, a marketer of natural gas, pursuant to an interruptible transportation agreement IT-1 dated

February 1 1989 (transportation agreement number 69716). The term of the transportation agreement is for two years from the date of initial delivery, and month to month thereafter unless terminated upon 30 days prior written notice to the other party. Northern proposes to transport on a peak day up to 200,000 MMBtu; on an average day up to 150,000 MMBtu; and on an annual basis 73,000,000 MMBtu of natural gas for Cibola. It is stated that unless Northern agrees in writing to a lower rate, Cibola shall pay Northern for the proposed transportation service the maximum rates or charges in effect from time to time under Rate Schedule IT-1, or any effective superseding rate schedule on file with the Commission. Northern proposes to receive the subject gas for Cibola at various receipt points on its system for delivery to various delivery points on its system. Northern avers that construction of facilities would not be required to provide the proposed service.

It is explained that the proposed service is currently being performed pursuant to the 120-day self implementing provision of § 284.223(a)(1) of the Commission's regulations. Northern commenced such self-implementing service on March 2, 1989, as reported in Docket No. ST89-2486-000.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 14. Southern Natural Gas Company

[Docket No. CP89-1106-000]

April 5, 1989.

Take notice that on March 29, 1989, Southern Natural Gas Company (Southern), Post Office Box 2563, Birmingham, Alabama 3502-2563 filed in Docket No. CP89-1106-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport natural gas on behalf of the Texican Natural Gas Company (Texican), a natural gas marketer, under its blanket authorization issued in Docket No. CP88-316-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

Southern would perform the proposed interruptible transportation service for Texican, pursuant to an interruptible transportation service agreement dated December 20, 1988. The transportation agreement is effective for a primary term of one month and month-to-month thereafter subject to termination by

either party giving five days written notice. Southern proposes to transport 49,000 MMBtu of natural gas on a peak day; 46,575 MMBtu on an average day; and on an annual basis 17,000,000 MMBtu of natural gas for Texican. Southern proposes to receive the subject gas at various existing points of receipt located in Alabama, Louisiana, offshore Louisiana, Mississippi, Texas and offshore Texas for redelivery to various points in Alabama and Georgia. Southern avers that no new facilities are required to provide the proposed service.

It is explained that the proposed service is currently being performed pursuant to the 120-day self implementing provision of § 284.223(a)(1) of the Commission's regulations. Southern commenced such self-implementing service on February 1, 1989, as reported in Docket No. ST89-2431-000.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 15. South Georgia Natural Gas Company

[Docket No. CP89-1084-000]

April 5, 1989.

Take notice that on March 27, 1989, South Georgia Natural Gas Company (South Georgia), P.O. Box 2563, Birmingham, Alabama 35202-2563, filed in Docket No. CP89-1084-000 a request pursuant to §§ 157.205, 157.212, and 157.216 of the Commission's Regulations for authorization to abandon by sale to the City of Tallahassee (Tallahassee), an existing customer, certain facilities and to construct and operate certain facilities in connection with a change in a delivery point for Tallahassee under South Georgia's blanket certificate issued in Docket No. CP82-548-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

South Georgia requests authorization to abandon by sale to Tallahassee a 4-inch meter run, a 6-inch meter run, two 2-inch regulators, associated piping and appurtenances located at the Tallahassee Meter Station at Mile Post 14.000 on South Georgia's Lateral Line No. 18 (Line No. 18); 5.8 miles of 6-inch pipeline extending from Mile Post 8.155 to Mile Post 14.000 on Line No. 18; and to abandon by replacement the regulatory station located at Mile Post 8.155 on Line No. 18. Also, South Georgia proposes to construct and operate one 6-inch turbine meter, two 2-inch regulators and appurtenances for a new delivery point to Tallahassee at

Mile Post 8.155 on Line No. 18 in Leon County, Florida. South Georgia states that the estimated cost of the new facilities is approximately \$135,400. There will be no increase in Tallahassee's maximum daily quantity of 6,060 Mcf associated with the proposed replacement, it is stated. South Georgia states that in conjunction with the proposed replacement of facilities, Tallahassee and South Georgia have agreed to change the contract delivery pressure at the new Tallahassee Meter Station to a delivery pressure of not less than 250 psig nor greater than 400 psig.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 16. Stingray Pipeline Company

[Docket No. CP89-1108-000]

April 5, 1989.

Take notice that on March 29, 1989, Stingray Pipeline Company (Stingray), P.O. Box 1642, Houston, Texas 77001, filed in Docket No. CP89-1108-000, an application pursuant to section 7(b) of the Natural Gas Act (NGA) for permission and approval to partially abandon natural gas transportation service for United Gas Pipe Line Company (United), Natural Gas Pipeline Company of America (NGPL), and Trunkline Gas Company (Trunkline), all as more fully set forth in the application which is on file with the Commission and open to public inspection.

It is stated that Stingray currently provides up to 90,000 Mcfd, 405,000 Mcfd, and 405,000 Mcfd of firm transportation service to United, NGPL, and Trunkline respectively. United, NGPL, and Trunkline have notified Stingray that they wish to reduce their certificated firm capacity to 56,000 Mcfd, 388,000 Mcfd, and 388,000 Mcfd respectively. Stingray asserts that only the firm transportation service is being reduced and that there would be no abandonment of any facilities.

It is claimed that transportation service for United, NGPL, and Trunkline was authorized by order issued May 6, 1974 at Docket No. CP73-27, *et al.*, 51 FPC 1446. Natural gas is received from offshore Louisiana in the West Cameron, East Cameron, High Island and Vermilion Areas and redelivered to a terminus near Holly Beach, Louisiana. United, NGPL, and Trunkline have advised Stingray that they wish to reduce their certificated firm transportation capacity provided under Rate Schedules T-1 and T-2.

Stingray alleges that the abandonment of service proposed by this application is in the public interest because it reflects the contractual requirements of

its shippers. Stingray requests an April 1, 1989, effective date for the proposed abandonment.

Comment date: April 26, 1989, in accordance with Standard Paragraph F at the end of this notice.

#### 17. United Gas Pipe Line Company

[Docket No. CP89-1094-000]

April 5, 1989.

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478 Houston, Texas 77251-1478, filed in Docket No. CP89-1094-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport natural gas on behalf of LaSER Marketing Company (LaSER), a natural gas marketer, under its blanket authorization issued in Docket No. CP88-6-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

United would perform the proposed interruptible transportation service for LaSER, pursuant to an interruptible transportation service agreement dated November 18, 1988 (Contract No. TI-21-1965). The transportation agreement is effective for a primary term of one month from the date of first delivery thereunder or such date that the parties mutually agree to terminate the agreement, and shall continue month to month thereafter unless terminated by thirty days written notice by either party. United proposes to transport up to a maximum of 618,000 MMBtu of natural gas on an average and peak day; and on an annual basis 225,570,000 MMBtu of natural gas for LaSER. United proposes to receive the subject gas at the existing interconnection between United and production facilities in Paul White Field No. 6858, Survey #1, A-334, Jim Wells County, Texas. It is stated that the points of delivery are located in the state of Louisiana. United avers that no new facilities are required to provide the proposed service.

It is explained that the proposed service is currently being performed pursuant to the 120-day self-implementing provision of § 284.223(a)(1) of the Commission's Regulations. United commenced such self-implementing service on February 22, 1989, as reported in Docket No. ST89-2631-000.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 18. United Gas Pipe Line Company

[Docket No. CP89-1091-000]

April 5, 1989.

Take notice that on March 28, 1989, United Gas Pipe Line Company (United), P.O. Box 1478, Houston, Texas 77251-1478, filed in Docket No. CP89-1091-000 a request pursuant to § 157.205 of the Commission's Regulations for authorization to transport natural gas on behalf of Chevron U.S.A., Incorporated (Chevron), a producer of natural gas, under United's blanket certificate issued in Docket No. CP88-6-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

United proposes to transport on an interruptible basis up to 103,000 MMBtu equivalent of natural gas on a peak day, 103,000 MMBtu equivalent on an average day, and 37,595,000 MMBtu equivalent on an annual basis. It is stated that United would receive the gas for Chevron's account at existing points on United's system in Louisiana, Texas and Mississippi, and would deliver equivalent volumes at existing points in Louisiana, Mississippi and Alabama. It is asserted that the transportation service would be effected utilizing existing facilities and would not require any construction of additional facilities. It is explained that the transportation service commenced February 1, 1989, as reported in Docket No. ST89-2653.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 19. ANR Pipeline Company

[Docket No. CP89-1078-000]

April 5, 1989.

Take notice that on March 24, 1989, ANR Pipeline Company (ANR), 500 Renaissance Center, Detroit, Michigan 48243, filed in Docket No. CP89-1078-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport gas for PSI, Inc. (PSI) a marketer of natural gas, under ANR's blanket certificate issued in Docket No. CP88-532-000, pursuant to Section 7 of the Natural Gas Act, all as more fully set forth in the request on file with the Commission.

Pursuant to a transportation service agreement executed January 5, 1989, ANR proposes to transport up to 10,000 dth of gas per day, on an interruptible basis, for PSI. ANR states that the gas would be received at various existing points of receipt along its system and transported to a point of delivery located in Hansford County, Texas. ANR anticipates transporting the full

10,000 dth on an average day and, based thereon, expects to transport 3,650,000 dth annually. ANR advises that the service commenced on February 1, 1989, as reported in Docket No. ST89-2546-000, pursuant to § 284.223(a) of the Commission's Regulations.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 20. Northern Natural Gas Company, Division of Enron Corp.

[Docket No. CP89-1128-000]

April 5, 1989.

Take notice that on March 31, 1989, Northern Natural Gas Company, Division of Enron Corp. (Northern), 1400 Smith Street, P.O. Box 1188, Houston, Texas 77251-1188, filed in Docket No. CP89-1128-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to provide an interruptible transportation service for Texas Gas Marketing, Inc. (Texaco), a marketer, under the blanket certificate issued in Docket No. CP86-435-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request that is on file with the Commission and open to public inspection.

Northern states that pursuant to a transportation agreement dated February 23, 1989, under its Rate Schedule IT-1, it proposes to transport up to 50,000 MMBtu per day equivalent of natural gas for Texaco. Northern states that it would transport the gas from a receipt point as shown in Appendix "A" of the transportation agreement and would deliver the gas to a delivery point also shown in Appendix "A" of the agreement.

Northern advises that service under § 284.223(a) commenced February 23, 1989, as reported in Docket No. ST89-2609 (filed March 9, 1989). Northern further advises that it would transport 37,500 MMBtu on an average day and 18,250,000 MMBtu annually.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

#### 21. ANR Pipeline Company

[Docket No. CP89-1115-000]

April 5, 1989.

Take notice that on March 30, 1989, ANR Pipeline Company (ANR), 500 Renaissance Center, Detroit, Michigan 48243, filed in Docket No. CP89-1115-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to transport natural gas

for Hollis Oil & Gas, Inc. (Hollis), a marketer of natural gas, under ANR's blanket certificate issued in Docket No. CP88-532-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

ANR proposes to transport on an interruptible basis up to 200,000 dt equivalent of natural gas on a peak day for Hollis, 200,000 dt equivalent on an average day and 73,000,000 dt equivalent on an annual basis. It is stated that ANR would receive the gas for Hollis's account at existing points on ANR's system in Fremont County, Wyoming and would deliver equivalent volumes at an existing interconnection with Colorado Interstate Gas Company in Fremont County, Wyoming. It is asserted that the transportation service would be effected utilizing existing facilities and would require no construction of additional facilities. It is explained that the transportation service commenced February 1, 1989, as reported in Docket No. ST89-2844.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

## 22. Northwest Pipeline Corporation

[Docket No. CP89-1124-000]

April 5, 1989.

Take notice that on March 31, 1989, Northwest Pipeline Corporation (Northwest), 295 Chipeta Way, Salt Lake City, Utah 84108, filed in Docket No. CP89-1124-000 a request pursuant to § 157.205 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205) for authorization to provide a transportation service for Westar Marketing Company (Westar), a marketer, under the blanket certificate issued in Docket No. CP86-578-000, pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request that is on file with the Commission and open to public inspection.

Northwest states that pursuant to a transportation agreement dated July 12, 1988, as amended July 13, 1988, and February 27, 1989, under its Rate Schedule TI-1, it proposes to transport up to 100,000 MMBtu per day equivalent of natural gas for Westar. Northwest states that it would transport the gas through its system from any transportation receipt point on its system to any transportation delivery point on its system.

Northwest advises that service under § 284.223(a) commenced February 25, 1989, as reported in Docket No. ST89-

2779 (filed March 22, 1989). Northwest further advises that it would transport 38,000 MMBtu on an average day and 14,000,000 MMBtu annually.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

## 23. Texas Gas Transmission Corporation

[Docket No. CP89-1111-000]

April 5, 1989.

Take notice that on March 30, 1989, Texas Gas Transmission Corporation (Texas Gas), P.O. Box 1160, Owensboro, Kentucky 42302, filed in Docket No. CP89-1111-000 a request for authorization pursuant to §§ 157.205 and 157.216 of the Commission's Regulations under the Natural Gas Act to abandon by removal certain pipe and miscellaneous fittings associated with a farm tap customer of the City of Covington, Tennessee (Covington), under Texas Gas' blanket certificate issued in Docket No. CP82-407-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request that is on file with the Commission and open to public inspection.

Texas Gas proposes at the request of Covington, a resale customer of Texas Gas, to abandon service to the McCalla farm tap. The tap is located at Mile Post 8+308 on Texas Gas' Shelby County-Ripley four-inch pipeline in Tipton County, Tennessee. Texas Gas states that the natural gas service to the tap will be continued on an uninterrupted basis by Covington through a newly constructed municipal distribution line recently installed and owned by Covington.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

## 24. Southern Natural Gas Company

[Docket No. CP89-1114-000]

April 5, 1989.

Take notice that on March 30, 1989, Southern Natural Gas Company (Southern), P.O. Box 2563, Birmingham, Alabama 35202-2563, filed in Docket No. CP89-1114-000 a request pursuant to §§ 157.205 and 284.223 (18 CFR 157.205 and 284.223) of the Commission's Regulations under the Natural Gas Act for authority to provide transportation service for Shell Gas Trading Company (Shell), a marketer of natural gas, under Southern's blanket transportation certificate which was by Commission order on May 5, 1988, in Docket No. CP88-316-000, all as more fully set forth in the request that is on file with the

Commission and open to public inspection.

Southern states that it will receive the gas from various points in offshore Texas, offshore Louisiana and the states of Texas, Louisiana, Mississippi, and Alabama for delivery to a point on Southern's Mississippi Chemical Line in Yazoo County, Mississippi.

Southern proposes to transport on a firm basis up to 50,000 Mcf of gas on a peak and average day and approximately 18,250,000 Mcf of gas annually. Southern states that the transportation service commenced under the 120-day automatic authorization of § 284.223(a) of the Commission's Regulations on February 8, 1989, pursuant to a transportation agreement dated February 6, 1989. Southern notified the Commission of the commencement of the transportation service in Docket No. ST89-2435-000 on February 28, 1989.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

## 25. K N Energy, Inc.

[Docket No. CP88-868-001]

April 5, 1989.

Take notice that on March 27, 1989, K N Energy, Inc. (K N), P.O. Box 15285, Lakewood, Colorado 80215, filed an Amendment to the Application in Docket No. CP88-868-000 pursuant to 18 CFR 385.215 and 18 CFR 285.216, so as to revise the original filing by withdrawing the proposal to relocate a compressor unit from the Palco, Kansas compressor station to the Big Springs compressor station and proposes, instead, to install a new 4,200 horsepower centrifugal compressor unit at Big Springs. K N states it re-examined the efficiency of its proposed relocation of the 2,000 hp compressor from K N's Palco station and determined that said unit should not be relocated. However, the need for additional compression at Big Springs remains an issue, therefore, K N is proposing herein a new 4,200 hp compressor unit be installed at Big Springs, to provide the backup compression necessitated to restore a peak day capability of 183 MMcf daily to serve K N's major market area situated east of Big Springs, Nebraska, all as more fully set forth in the request which is on file with the Commission and open to public inspection.

Comment date: May 22, 1989, in accordance with Standard Paragraph G at the end of this notice.

**26. Natural Gas Pipeline Company of America**

[Docket No. CP89-1112-000]

April 5, 1989.

Take notice that on March 30, 1989, Natural Gas Pipeline Company of America (Natural), 701 East 22nd Street, Lombard, Illinois 60148, filed in Docket No. CP89-1112-000 a request pursuant to §§ 157.205 and 284.223 of the Commission's Regulations under the Natural Gas Act (18 CFR 157.205 and 284.223) for authorization to provide an interruptible transportation service for Arco Oil and Gas Company, Division of Atlantic Richfield Company (ARCO), a producer of natural gas, under Natural's blanket certificate issued in Docket No. CP86-582-000 pursuant to section 7 of the Natural Gas Act, all as more fully set forth in the request on file with the Commission and open to public inspection.

Pursuant to an interruptible transportation service agreement dated November 11, 1988, Natural requests authorization to transport up to a maximum of 50,000 MMBtu equivalent of natural gas per day, plus any additional volumes accepted pursuant to the overrun provisions of Natural's Rate Schedule ITS, from the receipt point located in Bryan County, Oklahoma, and the delivery point located in Lamar, Texas, as indicated in Exhibit A and Exhibit B of the application, respectively. It is stated that no new facilities are to be constructed. Natural states that it is obligated to accept for transportation on an average day 35,000 MMBtu equivalent of natural gas and an annual quantity of 12,775,000 MMBtu equivalent of natural gas. Natural states that transportation service commenced for ARCO on February 4, 1989, under the 120-day automatic provisions of § 284.223(a) of the Commission's Regulations, as reported in Docket No. ST89-2846.

Comment date: May 22, 1989, in accordance with Standard Paragraph C at the end of this notice.

**27. Transcontinental Gas Pipe Line Corporation**

[Docket No. CP89-1090-000]

April 5, 1989.

Take notice that on March 28, 1989, Transcontinental Gas Pipe Line Corporation (Transco), Post Office Box 1396, Houston, Texas 77251, filed in Docket No. CP89-1090-000 a request for authorization to transport gas for Transco Energy Marketing Company (Shipper) under the prior notice procedure prescribed in §§ 157.205 and 284.223 of the Commission's Regulations and Transco's blanket certificate issued

in CP88-328-000, all as more fully set forth in the request which is on file with the Commission and available for public inspection.

Transco states that the total volume of gas to be transported for Shipper on a peak day will be 75,000 dt; on an average day will be 10,000 dt; and on an annual basis will be 3,650,000 dt.

Transco states it will receive the gas at various existing receipt points in Onshore and Offshore Louisiana, Onshore and Offshore Texas, Mississippi, Pennsylvania and New Jersey and deliver the gas at an existing point of interconnection at Cameron Parish, Louisiana.

Transco states that it will construct no new facilities in order to provide this transportation service. Transco will utilize facilities as reflected in Exhibit A of the transportation agreement.

Transco states that there is no agency relationship under which a local distribution company or an affiliate of Shipper will receive gas on behalf of Shipper.

Transco states that service for Shipper commenced February 11, 1989, in Docket No. ST89-2642, pursuant to the 120-day automatic provisions of § 284.223(a) of the Commission's Regulations.

Comment date: May 22, 1989, in accordance with Standard Paragraph C at the end of this notice.

**28. Trunkline Gas Company**

[Docket No. CP89-1109-000]

April 5, 1989.

Take notice that on March 29, 1989, Trunkline Gas Company (Trunkline), P.O. box 1642, Houston, Texas 77251-1642, filed in Docket No. CP89-1109-000 a request pursuant to §§ 157.205(b) and 284.223 of the Commission's Regulations under the Natural Gas Act for authorization to provide an interruptible transportation service for Citizens Gas Supply Corporation (Citizens), a shipper and producer of natural gas, under its blanket certificate issued in Docket No. CP86-586-000 pursuant to section 7 of the Natural Gas Act, as more fully set forth in the request on file with the Commission and open to public inspection.

Trunkline states that the maximum daily, average daily and annual quantities that it would transport for Citizens would be 120,000 dt equivalent of natural gas, 60,000 dt equivalent of natural gas and 21,900,000 dt equivalent of natural gas, respectively.

Trunkline states that it would transport natural gas for Citizens from various receipt points in Illinois, Louisiana, offshore Louisiana, Texas

and Tennessee to a delivery point in Jefferson Davis Parish, Louisiana.

Trunkline indicates that in a filing made with the Commission in Docket ST89-2777, it reported that transportation service for Citizens commenced on February 8, 1989, under the 120-day automatic authorization provisions of § 284.223(a).

Comment date: May 22, 1989, in accordance with Standard Paragraph C at the end of this notice.

**Standard Paragraphs**

F. Any person desiring to be heard or make any protest with reference to said filing should on or before the comment date file with the Federal Energy Regulatory Commission, a motion to intervene or a protest in accordance with the requirements of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214) and the Regulations under the Natural Gas Act (18 CFR 157.10). All protests filed with the Commission will be considered by it in determining the appropriate action to be taken but will not serve to make the protestants parties to the proceeding. Any person wishing to become a party to a proceeding or to participate as a party in any hearing therein must file a motion to intervene in accordance with the Commission's Rules.

Take further notice that, pursuant to the authority contained in and subject to jurisdiction conferred upon the Federal Energy Regulatory Commission by Sections 7 and 15 of the Natural Gas Act and the Commission's Rules of Practice and Procedure, a hearing will be held without further notice before the Commission or its designee on this filing if no motion to intervene is filed within the time required herein, if the Commission on its own review of the matter finds that a grant of the certificate is required by the public convenience and necessity. If a motion for leave to intervene is timely filed, or if the Commission on its own motion believes that a formal hearing is required, further notice of such hearing will be duly given.

Under the procedure herein provided for, unless otherwise advised, it will be unnecessary for the applicant to appear or be represented at the hearing.

G. Any person or the Commission's staff may, within 45 days after the issuance of the instant notice by the Commission, file pursuant to Rule 214 of the Commission's Procedural Rules (18 CFR 385.214) a motion to intervene or notice of intervention and pursuant to § 157.205 of the Regulations under the Natural Gas Act (18 CFR 157.205) a

protest to the request. If no protest is filed within the time allowed therefore, the proposed activity shall be deemed to be authorized effective the day after the time allowed for filing a protest. If a protest is filed and not withdrawn within 30 days after the time allowed for filing a protest, the instant request shall be treated as an application for authorization pursuant to section 7 of the Natural Gas Act.

Louis D. Cashell,  
Secretary.

[FR Doc. 89-8493 Filed 4-10-89; 8:45 am]

BILLING CODE 6717-01-M

**ENVIRONMENTAL PROTECTION AGENCY**

[FRL-3552-1]

**Transfer of Data to Contractors**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Notice of Intent to Transfer Confidential Information to a Contractor.

**SUMMARY:** The Environmental Protection Agency (EPA) intends to transfer confidential business information collected under section 308 of the Clean Water Act to one EPA contractor and three subcontractors for the purpose of developing hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA).

**DATES:** Comments on the notice of transfer are due April 21, 1989.

**ADDRESSES:** Comments may be sent to Marvin B. Rubin, Industrial Technology Division, Office of Water, (WH-552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. Comments should be identified as "Transfer of Confidential Data."

**FOR FURTHER INFORMATION CONTACT:** For technical information regarding the Office of Water data bases subject to this notice, contact Marvin B. Rubin, Industrial Technology Division, Office of Water, (WH-552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, (202) 382-7124. For technical information regarding data uses under RCRA contact Jose Labiosa, Office of Solid Waste (OS-322), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, (202) 382-4496. For information regarding the handling of RCRA confidential business information, contact Dina Villari, Office of Solid Waste (OS-312), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, (202) 382-4670.

**SUPPLEMENTARY INFORMATION**

**I. Transfer of Data**

In November 1984, Congress enacted amendments to the Resource Conservation and Recovery Act (RCRA) requiring the Agency to establish standards for treatment of hazardous wastes prior to land disposal. A major portion of this program involves identifying generators and treaters of these wastes and collecting performance data from existing full-scale technologies. EPA's Office of Solid Waste is responsible for these activities.

In connection with this effort under EPA Contract No. 68-01-7053, Versar, Inc. (Springfield, VA) and its subcontractors Radian Corp. (McLean, VA), Jacobs Engineering Groups, Inc. (Washington, DC), and Science Application International Corp. (McLean, VA) are assisting the Office of Solid Waste (OSW) in the development of treatment standards for hazardous wastes subject to the land disposal restriction rules under authority of sections 3004 and 3007 of RCRA. Specifically, as part of this work, these companies will assist OSW in conducting studies to assist in the development of Best Demonstrated Available Technology (BDAT) standards within the chlorinated and other organic chemicals, inorganic chemicals, petroleum refining, plastics, pesticides, dyes and pigments, coke by-products, wood preserving, rubber processing and other manufacturing industries listed in Table I.

The EPA Office of Water (OW) will transfer to these contractors certain information which has been, or will be, submitted to the EPA under Section 308 of the Clean Water Act (CWA) (33 U.S.C. 1318). Specifically, EPA will be transferring to these firms information collected under the CWA which supports EPA's efforts to establish Best Available Technology Economically Achievable (BAT) and Best Practicable Control Technology Currently Available (BPT) effluent limitations guidelines and standards for selected industrial categories. Some of the information gathered under the CWA which will be transferred to these contractors may be subject to claims of business confidentiality.

The specific data bases in the Office of Water which will be accessed by OSW contractors are listed in Table I by industrial point source category. Each industrial category has an associated data base consisting of data obtained by EPA field sampling, comments on proposals or notices, or by requests for data through CWA Section 308 Questionnaires. Most of the data is

expected to be part of the organic chemicals, plastics, and synthetic fibers industry category database used in developing regulations under 40 CFR Part 414. The data and information to be transferred concerns product/process and end-of-pipe wastewater and waste characteristics as well as treatment technology performance.

TABLE I.— LIST OF DATABASES FOR INDUSTRIAL CATEGORIES SUBJECT TO NATIONAL EFFLUENT LIMITATIONS AND STANDARDS

Industrial category	40 CFR Part No.
Aluminum forming .....	467
Asbestos manufacturing .....	427
Battery manufacturing .....	461
Builder's paper .....	431
Carbon black manufacturing .....	458
Coil coating (phase I and II) .....	465
Copper forming .....	468
Electroplating .....	413
Electrical and electronic components (Phase I and II) .....	469
Explosives manufacturing .....	457
Ferroalloy manufacturing .....	424
Fertilizer manufacturing .....	418
Glass manufacturing .....	426
Gum and wood chemicals .....	454
Hospitals .....	460
Ink formulating .....	447
Inorganic chemicals .....	415
Iron and steel manufacturing .....	420
Leather tanning and finishing .....	425
Metal finishing .....	433
Metal molding and casting .....	464
Nonferrous metals forming .....	471
Nonferrous metals manufacturing (phases I and II) .....	421
Oil and gas extraction .....	435
Organic chemicals and plastics and synthetic fibers .....	414
Paint formulating .....	446
Paving and roofing (tars and asphalt) .....	443
Pesticides .....	455
Petroleum refining .....	419
Pharmaceuticals .....	439
Phosphate manufacturing .....	422
Photographic .....	459
Plastics molding and forming .....	463
Porcelain enameling .....	466
Pulp and paper .....	430
Rubber processing .....	428
Soaps and detergents manufacturing .....	417
Steam electric .....	423
Sugar processing manufacturing .....	409
Timber products manufacturing .....	429
Textiles .....	410

Selected data from the Table I data bases will be needed by OSW for use in developing industry treatment standards for hazardous waste. Specific BDAT treatment standards are to be developed under RCRA authority for the listed wastes and identified constituents in wastes as given in Table II below.

Specific data needs for which the Clean Water Act section 308 data bases will be searched by these EPA contractors are as follows:



(1) Information describing the manufacturing process and industrial process wastes regulated by OW. This information will enable OSW to identify wastes regulated by OW which are also substantially similar to those wastes regulated by OSW (e.g., the wastes regulated by OW meet the listing criteria for wastes listed as hazardous under Subtitle C of RCRA (see 40 CFR Part 261, Subparts B, C, and D), and for other wastes under consideration (see 51 FR 19300 to 19308; May 28, 1986).

(2) Information describing the chemical and physical makeup of wastes regulated by OW. This information will enable OSW to establish a data base for wastes judged to be similar (e.g., wastes regulated by both OW and OSW).

The list of hazardous constituents targeted by OSW is summarized in Table II. This list is called the BDAT List of Hazardous Constituents. OSW may also add to its BDAT list of hazardous constituents those hazardous constituents targeted by OW (referred to by OW as Priority Pollutants).

(3) Information describing the design and operation of treatment processes treating wastes regulated by OW. This information will enable OSW to determine whether a BAT or a BPT model deserves consideration as BDAT.

(4) Information documenting the performance of treatment trains considered by OW in their efforts to develop BAT and BPT effluent limitations. This information includes characterization data describing the amount and types of hazardous constituents present in the untreated (influent) and treated (effluent) wastes; parameters that indicate the removal or destruction of chemical constituents (e.g., BOD and COD); and design and operational data (e.g., flows, retention times, pH, etc.). This information will enable OSW to judge whether BAT or BPT models meet the criteria for being identified as BDAT. Also, this information includes the Quality Assurance and Quality Control (QA/QC) Procedures employed by OW to confirm the detection of chemical constituents in the treated waste. QA/QC data will help OSW to adjust the treatment data and to conduct statistical analyses of the collected data in order to develop treatment standards as described in OSW's Generic Quality Assurance Project Plan for Land Disposal Restrictions Program ("BDAT"), (EPA/530-SW-87-011, March 1987; and 51 FR 40588 through 40592, November 7, 1986).

TABLE II.—BDAT CONSTITUENT LIST

BDAT Reference No.	Constituent	Cas No.
<b>Volatile Organics</b>		
222	Acetone	67-64-1
1	Acetonitrile	75-05-8
2	Acrolein	107-02-8
3	Acrylonitrile	107-13-1
4	Benzene	71-43-2
5	Bromodichloromethane	75-27-4
6	Bromomethane	74-83-9
223	n-Butyl alcohol	71-36-3
7	Carbon tetrachloride	56-23-5
8	Carbon disulfide	75-15-0
9	Chlorobenzene	108-90-7
10	2-Chloro-1,3-butadiene	126-99-8
11	Chlorodibromomethane	124-48-1
12	Chloroethane	75-00-3
13	2-Chloroethyl vinyl ether	110-75-8
14	Chloroform	67-66-3
15	Chloromethane	74-87-3
16	3-Chloropropene	107-05-1
17	1,2-Dibromo-3-chloropropane	96-12-8
18	1,2-Dibromoethane	106-93-4
19	Dibromomethane	74-95-3
20	trans-1,4-Dichloro-2-butene	110-57-6
21	Dichlorodifluoromethane	75-71-8
22	1,1-Dichloroethane	75-34-3
23	1,2-Dichloroethane	107-06-2
24	1,1-Dichloroethylene	75-35-4
25	trans-1,2-Dichloroethene	156-60-5
26	1,2-Dichloropropane	78-87-5
27	trans-1,3-Dichloropropene	10061-02-6
28	cis-1,3-Dichloropropene	10061-01-5
29	1,4-Dioxane	123-91-1
224	2-Ethoxyethanol	110-80-5
225	Ethyl acetate	141-78-6
226	Ethyl benzene	100-41-4
30	Ethyl cyanide	107-12-0
227	Ethyl ether	60-29-7
31	Ethyl methacrylate	97-63-2
214	Ethylene oxide	75-21-8
32	Iodomethane	74-88-4
33	Isobutyl alcohol	78-83-1
228	Methanol	67-56-1
34	Methyl ethyl ketone	78-93-3
229	Methyl isobutyl ketone	108-10-1
35	Methyl methacrylate	80-62-6
37	Methacrylonitrile	126-98-7
38	Methylene chloride	75-09-2
230	2-Nitropropane	79-46-9
39	Pyridine	110-86-1
40	1,1,1,2-Tetrachloroethane	630-20-6
41	1,1,2,2-Tetrachloroethane	79-34-6
42	Tetrachloroethene	127-18-4
43	Toluene	108-88-3
44	Tribromomethane	75-25-2
45	1,1,1-Trichloroethane	71-55-6
46	1,1,2-Trichloroethane	79-00-5
47	Trichloroethene	79-01-6
48	Trichloromonofluoromethane	75-69-4
49	1,2,3-Trichloropropane	96-18-4
231	1,1,2-Trichloro-1,2,2-trifluoro-ethane	76-13-1
50	Vinyl chloride	75-01-4
215	1,2-Xylene	97-47-6
216	1,3-Xylene	108-38-3
217	1,4-Xylene	106-44-5

TABLE II.—BDAT CONSTITUENT LIST—Continued

BDAT Reference No.	Constituent	Cas No.
<b>Semivolatile organics</b>		
51	Acenaphthalene	208-96-8
52	Acenaphthene	83-32-9
53	Acetophenone	96-86-2
54	2-Acetylaminofluorene	53-96-3
55	4-Aminobiphenyl	92-67-1
56	Aniline	62-53-3
57	Anthracene	120-12-7
58	Aramite	140-57-8
59	Benz(a)anthracene	56-55-3
218	Benzal chloride	98-87-3
60	Benzenethiol	108-98-5
61	Deleted	
62	Benzo(a)pyrene	50-32-8
63	Benzo(b)fluoranthene	205-99-2
64	Benzo(ghi)perylene	191-24-2
65	Benzo(k)fluoranthene	207-08-9
66	p-Benzoquinone	106-51-4
67	Bis(2-chloroethoxy)methane	111-44-4
68	Bis(2-chloroethyl)ether	39638-32-9
69	Bis(2-chloroisopropyl)ether	117-81-7
70	Bis(2-ethylhexyl)phthalate	
71	4-Bromophenyl phenyl ether	101-55-3
72	Butyl benzyl phthalate	85-68-7
73	2-sec-Butyl-4,6-dinitrophenol	88-85-7
74	p-Chloroaniline	106-47-8
75	Chlorobenzilate	510-15-6
76	p-Chloro-m-cresol	59-50-7
77	2-Chloronaphthalene	91-58-7
78	2-Chlorophenol	95-57-8
79	3-Chloropropionitrile	542-76-7
80	Chrysene	218-01-9
81	ortho-Cresol	95-48-7
82	para-Cresol	106-44-5
232	Cyclohexanone	108-94-1
83	Dibenz(a,h)anthracene	53-70-3
84	Dibenzo(a,e)pyrene	192-65-4
85	Dibenzo(a,i)pyrene	189-55-9
86	m-Dichlorobenzene	541-73-1
87	o-Dichlorobenzene	95-50-1
88	p-Dichlorobenzene	106-46-7
89	3,3'-Dichlorobenzidine	91-94-1
90	2,4-Dichlorophenol	120-83-2
91	2,6-Dichlorophenol	87-65-0
92	Diethyl phthalate	84-66-2
93	3,3'-Dimethoxybenzidine	119-90-4
94	p-Dimethylaminoazobenzene	60-11-7
95	3,3'-Dimethylbenzidine	119-93-7
96	2,4-Dimethylphenol	105-67-9
97	Dimethyl phthalate	131-11-3
98	Di-n-butyl phthalate	84-74-2
99	1,4-Dinitrobenzene	100-25-4
100	4,6-Dinitro-o-cresol	534-52-1
101	2,4-Dinitrophenol	51-28-5
102	2,4-Dinitrotoluene	121-14-2
103	2,6-Dinitrotoluene	606-20-2
104	Di-n-octyl phthalate	117-84-0
105	Di-n-propylnitrosamine	621-64-7
106	Diphenylamine	122-39-4
219	Diphenylnitrosamine	86-30-613
107	1,2-Diphenylhydrazine	122-66-7
108	Fluoranthene	206-44-0
109	Fluorene	86-73-7
110	Hexachlorobenzene	118-74-1
111	Hexachlorobutadiene	87-68-3
112	Hexachlorocyclopentadiene	77-47-4
113	Hexachloroethane	67-72-1

TABLE II.—BDAT CONSTITUENT LIST—  
Continued

BDAT Reference No.	Constituent	Cas No.
114	Hexachlorophene	70-30-4
115	Hexachloropropene	1888-71-7
116	Indeno(1,2,3-cd)pyrene	193-39-5
117	Isosafrole	120-58-1
118	Methapyrilene	91-80-5
119	3-Methylcholanthrene	56-49-5
120	4,4'-Methylenebis(2-chloroaniline)	101-14-4
36	Methyl methanesulfonate	66-27-3
121	Naphthalene	91-20-3
122	1,4-Naphthoquinone	130-15-4
123	1-Naphthylamine	134-32-7
124	2-Naphthylamine	91-59-8
125	p-Nitroaniline	100-01-6
126	Nitrobenzene	98-95-3
127	4-Nitrophenol	100-02-7
128	N-Nitrosodi-n-butylamine	924-16-3
129	N-Nitrosodiethylamine	55-18-5
130	N-Nitrosodimethylamine	62-75-9
131	N-Nitrosomethylethylamine	10595-95-6
132	N-Nitrosomorpholine	59-89-2
133	N-Nitrosopiperidine	100-75-4
134	N-Nitrosopyrrolidine	930-55-2
135	5-Nitro-o-toluidine	99-65-8
136	Pentachlorobenzene	608-93-5
137	Pentachloroethane	76-01-7
138	Pentachloronitrobenzene	82-68-8
139	Pentachlorophenol	87-86-5
140	Phenacetin	62-44-2
141	Phenanthrene	85-01-8
142	Phenol	108-95-2
220	Phthalic anhydride	85-44-9
143	2-Picoline	109-06-8
144	Pronamide	23950-58-5
145	Pyrene	129-00-0
146	Resorcinol	108-46-314
147	Safrole	94-59-7
148	1,2,4,5-Tetrachlorobenzene	95-94-3
149	2,3,4,6-Tetrachlorophenol	58-90-2
150	1,2,4-Trichlorobenzene	120-82-1
151	2,4,5-Trichlorophenol	95-95-4
152	2,4,6-Trichlorophenol	88-06-2
153	Tris(2,3-dibromopropyl)phosphate	126-72-7
<b>Metals</b>		
154	Antimony	7440-36-0
155	Arsenic	7440-38-2
156	Barium	7440-39-3
157	Beryllium	7440-41-7
158	Cadmium	7440-43-9
159	Chromium (total)	7440-47-3
221	Chromium (hexavalent)	
160	Copper	7440-50-8
161	Lead	7439-92-1
162	Mercury	7439-97-6
163	Nickel	7440-02-0
164	Selenium	7782-49-2
165	Silver	7440-22-4
166	Thallium	7440-28-0
167	Vanadium	7440-62-2
168	Zinc	7440-66-6
<b>Inorganics other than metals</b>		
169	Cyanide	57-12-5
170	Fluoride	16964-48-8

TABLE II.—BDAT CONSTITUENT LIST—  
Continued

BDAT Reference No.	Constituent	Cas No.
171	Sulfide	8496-25-8
<b>Organochlorine pesticides</b>		
172	Aldrin	309-00-2
173	alpha-BHC	319-84-6
174	beta-BHC	319-85-7
175	delta-BHC	319-86-8
176	gamma-BHC	58-89-9
177	Chlordane	57-74-9
178	DDD	72-54-8
179	DDE	72-55-9
180	DDT	50-29-3
181	Dieldrin	60-57-1
182	Endosulfan I	939-98-8
183	Endosulfan II	33213-6-5
184	Endrin	72-20-8
185	Endrin aldehyde	7421-93-4
186	Heptachlor	76-44-8
187	Heptachlor epoxide	1024-57-3
188	Isodrin	465-73-6
189	Kepone	143-50-0
190	Methoxychlor	72-43-5
191	Toxaphene	8001-35-2
<b>Phenoxyacetic acid herbicides</b>		
192	2,4-Dichlorophenoxyacetic acid	94-75-7
193	Silvex	93-72-1
194	2,4,5-T	93-76-5
<b>Organophosphorous insecticides</b>		
195	Disulfoton	298-04-4
196	Famphur	52-85-7
197	Methyl parathion	298-00-0
198	Parathion	56-38-2
199	Phorate	298-02-2
<b>PCBs</b>		
200	Aroclor 1016	12674-11-2
201	Aroclor 1221	11104-28-2
202	Aroclor 1232	11141-16-5
203	Aroclor 1242	53469-21-9
204	Aroclor 1248	12672-29-6
205	Aroclor 1254	11097-69-1
206	Aroclor 1260	11096-82-5
<b>Dioxins and furans</b>		
207	Hexachlorodibenzo-p-dioxins	
208	Hexachlorodibenzofurans	
209	Pentachlorodibenzo-p-dioxins	
210	Pentachlorodibenzofurans	
211	Tetrachlorodibenzo-p-dioxins	
212	Tetrachlorodibenzofurans	
213	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6

In accordance with 40 CFR 2.305(h), EPA has determined that Versar and its subcontractors require access to the above described information, including information claimed as confidential business information, which has been or

will be submitted to EPA under Section 308 of the CWA, to allow EPA to complete BDAT treatment standards under RCRA. Disclosure of this information to Versar and its subcontractors is necessary in order that those companies may carry out the work required by their contracts. This information also could have been required to be submitted under section 3007 of RCRA. EPA is issuing this Notice to inform all submitters of such information that EPA will be transferring their data, including any claimed confidential, to Versar and its subcontractors, beginning no less than ten days after publication of this notice. Upon completing their review of materials submitted for these industries, Versar and its subcontractors are required by their contracts to return all such materials to EPA.

EPA has approved the RCRA security plans of these four contractors and has inspected their facilities for compliance. Personnel from these firms are required to sign non-disclosure agreements and be briefed on appropriate security procedures before they are permitted access to confidential information in accordance with the "RCRA Confidential Business Information Security Manual" and the RCRA Contractor Requirements Manual.

**List of Subjects**

40 CFR Part 2

Administrative practice and procedure, Freedom of information, Confidential business information.

40 CFR Part 264

Hazardous waste, Best demonstrated available technology standards.

40 CFR Part 414

Organic chemicals manufacturing, Plastics manufacturing, Synthetic fibers manufacturing, Water pollution control, Water treatment and disposal.

Date: March 20, 1989.

William A. Whittington,

Acting Assistant Administrator, Office of Water.

[FR Doc. 89-8420 Filed 4-10-89; 8:45 am]

BILLING CODE 6560-50-M

**EQUAL EMPLOYMENT OPPORTUNITY COMMISSION**

Higher Education Staff Information Report (EEO-6)

AGENCY: Equal Employment Opportunity Commission.

**ACTION:** Notice of change in Survey Form and Instruction, Higher Education Staff Information (EEO-6) Report.

**SUMMARY:** Starting with the 1989 survey year, the salary ranges on the EEO-6 form (see 23 CFR Part 1602, Subpart P) will be revised to reflect current earnings levels.

**DATE:** This change will be effective beginning with the 1989 EEO-6 survey.

**FOR FURTHER INFORMATION CONTACT:** Joachim Neckere, Director, Program Research and Surveys Division Operations Research and Planning Programs Office of Program Operations Equal Employment Opportunity Commission 2401 E Street NW., Washington, DC 20507 (202/634-6750).

**SUPPLEMENTARY INFORMATION:** The above change involves a modification in the reporting form and does not entail any additional reporting requirements. The salary ranges on the EEO-6 form will be revised to reflect current earnings levels by occupational group, starting with the 1989 survey, as follows:

Faculty: 9-10 Month Contract, 11-12 Month Contract.

Executive/Administrative/Managerial. Other Professionals (Support/Service):

Current ranges	Revised ranges
Below \$10,000.....	Below \$20,000
10,000-14,999.....	20,000-24,999
15,000-19,999.....	25,000-29,999
20,000-24,999.....	30,000-34,999
25,000-29,999.....	35,000-39,999
30,000-34,999.....	40,000-44,999
35,000-39,999.....	45,000-54,999
40,000-And Above...	55,000-And Above

Secretarial/Clerical  
Technical/Paraprofessional  
Skilled Craft:

Current ranges	Revised ranges
Below \$8,000.....	Below \$12,000
8,000-11,999.....	12,000-15,999
12,000-15,999.....	16,000-19,999
16,000-21,999.....	20,000-24,999
22,000-29,999.....	25,000-29,999
30,000-And Above...	30,000-And Above

Service/Maintenance:

Current ranges	Revised ranges
Below \$8,000.....	Below \$12,000
8,000-11,999.....	12,000-14,999
12,000-17,999.....	15,000-17,999
18,000-24,999.....	18,000-24,999
25,000-And Above...	25,000-And Above

Signed at Washington, DC this 29th day of March, 1989

For the Commission.

Clarence Thomas,  
Chairman.

[FR Doc. 89-8498 Filed 4-10-89; 8:45 am]

BILLING CODE 6570-06-M

**FEDERAL MARITIME COMMISSION**

**Agreement(s) Filed**

The Federal Maritime Commission hereby gives notice of the filing of the following agreement(s) pursuant to section 5 of the Shipping Act of 1984.

Interested parties may inspect and obtain a copy of each agreement at the Washington, DC Office of the Federal Maritime Commission, 1100 L Street NW., Room 10325. Interested parties may submit comments on each agreement to the Secretary, Federal Maritime Commission, Washington, DC 20573, within 10 days after the date of the *Federal Register* in which this notice appears. The requirements for comments are found in § 572.603 of Title 46 of the Code of Federal Regulations. Interested persons should consult this section before communicating with the Commission regarding a pending agreement.

*Agreement No.:* 224-200234.

*Title:* Port of Palm Beach Terminal Agreement.

*Parties:*

Port of Palm Beach District (PPB)  
Teeters Brothers Contracting Corp.  
(Teeters)

*Synopsis:* The Agreement provides for Teeters' lease of a certain portion of Warehouse "A" for cargo handling and storage. Teeters agrees to an annual rent of \$20,671 and a minimum wharfage guarantee of 20,000 tons of cargo per year. At its own expense, PPB can move Teeters to like premises with like access to berths at the Port of Palm Beach. The term of the Agreement expires on June 30, 1996.

*Agreement No.:* 224-200234-001.

*Title:* Port of Palm Beach Agreement.

*Parties:*

Port of Palm Beach District (PPB)  
Teeters Brothers Contracting Corp.  
(Teeters)

*Synopsis:* The Agreement amends the basic agreement (Agreement No. 224-200234) to provide Teeters the right of first refusal to lease a certain portion of Warehouse "A" which is currently under lease to Palm Beach Steamship Agency (PBSA) should PBSA vacate its space.

*Agreement No.:* 224-200235.

*Title:* Port of Palm Beach Terminal Agreement.

*Parties:*

Port of Palm Beach District  
Palm Beach Steamship Agency

*Synopsis:* The Agreement provides for the lease a certain portion of Warehouse "A" at the Port of Palm Beach for the purpose of cargo handling and storage. The term of the lease expires June 30, 1991, and may be extended for a five-year additional period.

*Agreement No.:* 224-200233.

*Title:* Philadelphia Port Corporation Terminal Agreement.

*Parties:*

Philadelphia Port Corporation  
Holt Cargo Systems, Inc.

*Synopsis:* The Agreement provides for the ten-year lease and marine terminal operation of the Packer Avenue Marine Terminal at the Port of Philadelphia. Holt will provide two additional modern cranes for the facility. The Agreement may be renewed for two consecutive additional periods of five years each.

By Order of the Federal Maritime Commission.

Joseph C. Polking,  
Secretary.

Dated: April 6, 1989.

[FR Doc. 89-8520 Filed 4-10-89; 8:45 am]

BILLING CODE 6730-01-M

**FEDERAL TRADE COMMISSION**

**Granting of Request for Early Termination of the Waiting Period under the Premerger Notification Rules**

Section 7A of the Clayton Act, 15 U.S.C. 18a, as added by Title II of the Hart-Scott-Rodino Antitrust Improvements Act of 1976, requires persons contemplating certain mergers or acquisitions to give the Federal Trade Commission and the Assistant Attorney General advance notice and to wait designated periods before consummation of such plans. Section 7A(b)(2) of the act permits the agencies, in individual cases, to terminate this waiting period prior to its expiration and requires that notice of this action be published in the *Federal Register*.

The following transactions were granted early termination of the waiting period provided by law and the premerger notification rules. The grants were made by the Federal Trade Commission and the Assistant Attorney General for the antitrust division of the Department of Justice. Neither agency intends to take any action with respect to these proposed acquisitions during the applicable waiting period:

## Transactions Granted Early Termination Between: 03/20/89 AND 03/31/89

Name of acquiring person, name of acquired person, name of acquired entity	PMN No.	Date terminated
The Clayton & Dubilier Private Equity Fund Ltd. Ptnp., Westinghouse Electric Corporation, Westinghouse Electric Corporation	89-1151	03/20/89
MAPCO Inc., Holland Carbon Fuels USA, Inc., Scotts Branch Co. & related assets	89-1186	03/20/89
First Chicago Corporation, Society for Savings Bancorp, Inc., The Society for Savings	89-1232	03/20/89
Joseph Brender, Dan River Holding Company ESOPT, Dan River Holding Company	89-1236	03/20/89
Cipher Data Products, Inc., Irwin Magnetic Systems, Inc., Irwin Magnetic Systems, Inc.	89-1260	03/20/89
The President and Fellows of Harvard College, Harken Energy Corporation, Harken Acquisition Corporation	89-0979	03/21/89
New York Life Insurance Company, Reading & Bates Corporation, Reading & Bates Petroleum Co.	89-1235	03/22/89
United Technologies Corporation, First Technology PLC, First Technology PLC	89-1252	03/22/89
Prudential-Bache Energy Income Ltd. Partnership VIP-23, PS Group, Inc., CHAT Partnership	89-1286	03/22/89
Prudential-Bache Energy Income Ltd. Partnership VIP-24, PS Group, Inc., CHAT Partnership	89-1287	03/22/89
Marine Wendel Company, MB Group plc, certain US subsidiaries of MB Group plc	89-1269	03/23/89
George Wimpey PLC, Broyhill & Associates, Inc., Broyhill & Associates, Inc.	89-1295	03/23/89
Serge Kampf, Systemation, Inc., Systemation, Inc.	89-1129	03/24/89
United Meridian Corporation, General Energy Development, Ltd., General Energy Development, Ltd.	89-1193	03/24/89
Eli S. Jacobs, Estate of Edward Bennett Williams, Baltimore Orioles, Inc.	89-1213	03/24/89
Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Reading & Bates Corporation, Green Holdings, Inc.	89-1241	03/24/89
Hochtief Aktiengesellschaft Vorm. Gebr. Helfman, Leighton Holdings Limited, Green Holdings, Inc.	89-1242	03/24/89
Golder, Thoma, Cressey Fund III Limited Partnership, American Income Holding, Inc. a newly formed company, American Income Holding, Inc.	89-1257	03/24/89
Golder, Thoma, Cressey Fund III Limited Partnership, American Income Life Insurance Company, American Income Life Insurance Company	89-1258	03/24/89
Edward W. Ross and his wife, Renee Ross, Mr. Ronald J. Benach, Lexington Development Corporation & BBM Contractors Inc.	89-1265	03/24/89
Hans-Otto Schumann, Jean D. Rosow, Moore & Munger Marketing, Inc.	89-1283	03/24/89
Shandwick plc, Foote, Cone & Belding Communications, Inc., Golin/Harris Communications, Inc.	89-1297	03/24/89
Quantum Fund N.V., JoS. A. Bank Clothiers, Inc., JoS. A. Bank Clothiers, Inc.	89-1309	03/24/89
Palmer Communications Incorporated, Knight-Ridder, Inc., Knight-Ridder Broadcasting, Inc.	89-1321	03/24/89
Compagnie de Signaux et d'Equipements Electroniques, Telecom Technologies, Telecom Technologies	89-1322	03/24/89
Merrill Lynch & Co., Inc., Pullman Partners, Star Manufacturing Co.	89-1331	03/24/89
Kirby Exploration Company, Inc., Ed A. Smith, Alamo Inland Marine Co.	89-1280	03/27/89
US West, Inc., Enhance Financial Services, Inc., Enhance Financial Services, Inc.	89-1291	03/27/89
Consolidated Freightways, Inc., Emery Air Freight Corporation, Emery Air Freight Corporation	89-1128	03/28/89
The 1964 Simmons Trust, PACCAR, Inc., PACCAR, Inc.	89-1191	03/28/89
Takata Corporation, Jerry Ganz, Gateway Industries, Inc.	89-1205	03/28/89
PepsiCo, Inc., Kenneth F. Froelich, Frito-Lay of Hawaii, Inc.	89-1245	03/28/89
Silgan Corporation, Jurgen Armemann, Fortune Plastics, Inc.	89-1271	03/28/89
Silgan Corporation, Gordon Malloch, Fortune Plastics, Inc.	89-1272	03/28/89
Southwest Marine, Inc., Northwest Marine Iron Works, Northwest Marine Iron Works	89-1279	03/28/89
American Continental Corporation, Lincoln Savings Acquisition Corporation, Crescent Hotel Group, CR-ESFIN Corp. & assets of PCP	89-1299	03/28/89
The Fulcrum III Limited Partnership, GGvA Holding Corp., GGvA Holding Corp.	89-1310	03/28/89
The Second Fulcrum III Limited Partnership, GGvA Holding Corp., GGvA Holding Corp.	89-1311	03/28/89
Ernest Wuliger, GGvA Holding Corp., GGvA Holding Corp.	89-1325	03/28/89
The Graduate Hospital Foundation, John Hancock Mutual Life Insurance Company, John Hancock HealthPlan of Pennsylvania, Inc.	89-1333	03/28/89
LFXR Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1334	03/28/89
Corporate Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1335	03/28/89
Corporate Offshore Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1336	03/28/89
LFXR Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1341	03/28/89
Corporate Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1342	03/28/89
Corporate Offshore Partners, L.P., Polaroid Corporation, Polaroid Corporation	89-1343	03/28/89
Transco Energy Company, CSX Corporation, Texas Gas Transmission Corporation, TXG Gas Marketing	89-0840	03/29/89
Redland PLC, Arundel Asphalt Products, Inc., Arundel Asphalt Products, Inc.	89-1221	03/29/89
Mr. Klaus Murrmann, Sundstrand Corporation, Susco Acquisition Corp.	89-1227	03/29/89
M.A. Hanna Company, Dyson, Dyson & Dunn, Inc., Bruck Plastics Co.	89-1275	03/29/89
Hvide Shipping, Incorporated, Craig H. Stevenson, L. Stephen Willrich, Ocean Specialty Tankers Corp.	89-1306	03/29/89
Hvide Shipping, Incorporated, L. Stephen Willrich, Ocean Specialty Tankers Corp.	89-1307	03/29/89
Royal Dutch Petroleum Company, Texas Eastern Corporation, TPG, Inc.	89-1320	03/29/89
Morley P. Thompson, Meritor Savings Bank, Meritor Mortgage Corporation-West	89-1324	03/29/89
OMI Corp., Crain H. Stevenson, L. Stephen Willrich, Ocean Specialty Tankers Corp.	89-1361	03/29/89
OMI Corp., L. Stephen Willrich, Ocean Specialty Tankers Corp.	89-1362	03/29/89
Rhone-Poulenc S.A., Monsanto Company, Monsanto Company	89-1210	03/30/89
The Vinton Corporation, Martin Marietta Corporation, Martin Marietta Corporation	89-1264	03/30/89
Tele-Communications, Inc., John J. McMullen, Home Sports Entertainment, Ltd.	89-1308	03/30/89
Bissell Inc., Camp International, Inc., Camp International, Inc.	89-1209	03/31/89
Pennti Kouri & Co., Huhtamaki Oy certain assets of Leaf, Inc.	89-1217	03/31/89
Exxon Corporation, Amoco Corporation, Amoco Corporation	89-1281	03/31/89
John E. Sheehan, Bethlehem Steel Corporation, Bethlehem Elevator International & Wire Rope Division	89-1329	03/31/89
C.S. First Boston Inc., J.P. Industries, Inc., JPI Plumbing Products, Inc.	89-1340	03/31/89
General Motors Corporation, Meritor Savings Bank, Meritor Savings Bank	89-1349	03/31/89
Metropolitan Life Insurance Company, Briggs Industries Holding Corp., Briggs Industries Holding Corp.	89-1350	03/31/89
Metropolitan Life Insurance Company, J.P. Industries, Inc., JPI Plumbing Products, Inc.	89-1352	03/31/89
Heitman Real Estate Fund III, William E. Schmidt, Honey Creek Associates	89-1353	03/31/89
Commonwealth of Pennsylvania SERS, William E. Schmidt, Honey Creek Associates	89-1354	03/31/89
Infinity Broadcasting Corporation, JAG Communications, Inc., JAG Communications, Inc.	89-1357	03/31/89
Shaw Industries Ltd., B.C. Pacific Capital Corporation, OMSCO Industries, Inc. and Mark Products, Inc.	89-1367	03/31/89
JWP Inc., LECO Enterprises Inc., LEC Acquisition Company, Inc.	89-1372	03/31/89
ASR Acquisition Corp., J. Gray Ferguson, American Safety Razor Company	89-1373	03/31/89
Yamanouchi Pharmaceutical Co., Ltd., Shaklee Corporation, Shaklee Corporation	89-1375	03/31/89
Yamanouchi Pharmaceutical Co., Ltd., Shaklee Corporation, Shaklee Corporation	89-1376	03/31/89
BellSouth Corporation, Mobile Communications Corporation of America, Mobile Communications Corporation of America	89-1377	03/31/89
Century Communications Corp., Citizens Utilities Company, Citizens Utilities Company	89-1379	03/31/89

## Transactions Granted Early Termination Between: 03/20/89 AND 03/31/89—Continued

Name of acquiring person, name of acquired person, name of acquired entity	PMN No.	Date terminated
The Rank Organisation PLC, Cineplex Odeon Corporation, Cineplex Holdings, Inc.....	89-1381	03/31/89
Proven Properties Inc., Transco Energy Company certain assets of TXP, Operating Company.....	89-1383	03/31/89

**FOR FURTHER INFORMATION CONTACT:**

Sandra M. Peay, Contact  
Representative, Premerger Notification  
Office, Bureau of Competition, Room  
303, Federal Trade Commission,  
Washington, DC 20580. (202) 326-3100.

By direction of the Commission.

Donald S. Clark,

Secretary.

[FR Doc. 89-8524 Filed 4-10-89; 8:45 am]

BILLING CODE 6750-01-M

**DEPARTMENT OF HEALTH AND HUMAN SERVICES****Agency for Toxic Substances and Disease Registry****Listing of Areas Closed to the Public Due to Contamination by Toxic Substances**

**AGENCY:** Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service (PHS), (HHS).

**ACTION:** Notice of availability.

The 1988 listing of areas closed to the public, or otherwise restricted in use due to toxic substances contamination, is available under the title "Restrictions Imposed on Contaminated Sites: A Status of State Actions" from the National Governors' Association.

This report is required of the Agency for Toxic Substances and Disease Registry (ATSDR) by section 104(i)(1)(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended.

A limited supply of this two-volume report will be made available to the public upon request to: National Governors' Association, National Resources Policy Studies, Center for Policy Research, Hall of the States, 444 North Capitol Street, Washington, DC 20001-1572, Attn: Domenic Forcella.

Dated: April 5, 1989.

Walter R. Dowdle,

Acting Administrator, Agency for Toxic Substances and Disease Registry.

[FR Doc. 89-8467 Filed 4-10-89; 8:45 am]

BILLING CODE 4160-70-M

**Agency for Toxic Substances and Disease Registry**

[ATSDR-9]

**Extension of Public Comment Period for Draft Toxicological Profiles**

**AGENCY:** Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service (PHS), (HHS).

**ACTION:** Notice.

**SUMMARY:** The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), as amended by the Superfund Amendments and Reauthorization Act (SARA)(Pub. L. 99-499) requires that ATSDR compile a priority list of at least 100 hazardous substances which are most commonly found at facilities on the CERCLA National Priorities List (NPL), and which are determined to pose the most significant threat to human health. The list identifying the first 100 chemicals determined to pose the most significant potential threat to human health was published in the *Federal Register* on April 17, 1987 (52 FR 12866), as required by CERCLA 104(i)(2)(A). The Administrator of ATSDR is further required by CERCLA 104(i)(3) to prepare toxicological profiles for each substance previously included on the first priority list of 100 chemicals.

The availability of the second 25 draft toxicological profiles prepared by ATSDR, was published in the *Federal Register* on December 20, 1988 (53 FR 51192), with notice that a 90-day public comment period would be provided for each profile. The close of the comment period for each draft profile was indicated on the front of each profile.

This notice announces an extension from the date of April 14, 1989, published on the front of each profile to May 15, 1989, for each of the 25 draft profiles now available for public comment.

**Revised Dates for End of Public Comment Period**

The date of April 14, 1989, indicated on the front cover of each of the 25 profiles now available for public comment is extended to May 15, 1989. This extension compensates for printing and distribution problems which

delayed the availability of some profiles and might have compromised the 90-day time period for public comment for some people who requested those profiles.

As indicated in the *Federal Register* announcement of December 20, 1988 (53 FR 51192), one copy of all comments and five copies of all supporting documents are required. The comments should be submitted to: Mr. Edward J. Skowronski, Assistant Branch Chief, Research Analysis Branch, Agency for Toxic Substances and Disease Registry, Chamblee 28 South, 1600 Clifton Road, Atlanta, GA 30333.

Dated: April 5, 1989.

Walter R. Dowdle,

Acting Administrator, Agency for Toxic Substances and Disease Registry.

[FR Doc. 89-8468 Filed 4-10-89; 8:45 am]

BILLING CODE 4160-70-M

**Centers for Disease Control****National Committee on Vital Health and Statistics; Meeting**

**ACTION:** Notice of meeting.

In accordance with the Federal Advisory Committee Act (Pub. L. 92-463), notice is hereby given that the National Committee on Vital and Health Statistics (NCVHS) Subcommittee on Minority Health Statistics established pursuant to 42 U.S.C. 242k, section 306(k)(2) of the Public Health Service Act, as amended, announces the following Subcommittee meeting.

*Name:* National Committee on Vital and Health Statistics Subcommittee on Minority Health Statistics.

*Time and Date:* 9 a.m.-5 p.m.—May 3, 1989.

*Place:* Room 337A-339A, Hubert H. Humphrey Building, 200 Independence Avenue SW., Washington, DC.

*Status:* Open.

*Purpose:* The Subcommittee will hear presentations on statistical data regarding access and financing of medical care for the medically indigent.

*Contact Person for More Information:* Substantive program information as well as summaries of the meeting and roster of Committee members may be obtained from Gail F. Fisher, Ph.D., Executive Secretary, National Committee on Vital

and Health Statistics, Room 2-12, 3700 East-West Highway, Hyattsville, Maryland 20782, telephone (301) 436-7050.

Dated: April 4, 1989.

Elvin Hilyer,

Associate Director for Policy Coordination  
Centers for Disease Control.

[FR Doc. 89-8471 Filed 4-10-89; 8:45 am]

BILLING CODE 4160-18-M

## Food and Drug Administration

[Docket No. 87P-0198]

### Dessert Mousse; Termination of Consideration of Establishing a U.S. Standard of Identity

**AGENCY:** Food and Drug Administration.

**ACTION:** Notice.

**SUMMARY:** The Food and Drug Administration (FDA) is denying a petition that requested the agency to establish a U.S. standard of identity for dessert mousse. Available information demonstrates that there is neither sufficient interest nor need to warrant proposing a U.S. standard of identity for dessert mousse.

**FOR FURTHER INFORMATION CONTACT:**

Howard A. Anderson, Center for Food Safety and Applied Nutrition (HFF-414), Food and Drug Administration, 200 C Street SW., Washington, DC 20204, 202-485-0119.

**SUPPLEMENTARY INFORMATION:** In the Federal Register of March 15, 1988 (53 FR 8512), FDA published a notice announcing that Velvete Foods, Inc., P.O. Box 854, Ardmore, PA 19003, had submitted a petition requesting establishment of a U.S. standard of identity for dessert mousse. FDA published a notice of submission of the petition because, under section 701(e) of the Federal Food, Drug, and Cosmetic Act (the act) (21 U.S.C. 371(e)), a petition that is the basis for promulgation of a standard of identity must make a showing of "reasonable grounds" for the proposed regulation. In its Federal Register notice, FDA stated that the agency did not have sufficient information to determine whether promulgation of the requested regulation would be in the best interest of consumers and invited interested persons to submit data and information on the need for such a standard, as well as on a number of factors including, but not limited to, certain provisions set forth in the petition. Interested persons had until May 16, 1988, to reply.

Thirteen letters were received from industry and trade associations in response to the notice. Nine letters

opposed the establishment of any standard of identity for dessert mousse. These comments contended that there is no evidence that consumers want or need a standard of identity for dessert mousse and that there is no evidence of consumer misunderstanding or confusion in the marketplace among existing products. Some comments noted that the term "mousse" has evolved over the years to include dessert foods of varying composition and believed that any standard of identity would exclude many products currently on the market and prevent innovation in future formulation of these desserts. These comments, therefore, concluded that the requested regulation would not be in the best interest of consumers because it puts unnecessary restrictions on the ingredients that must be used. The agency received four comments that did not expressly oppose establishment of a dessert mousse standard, but that nonetheless stated strong opposition to the standard proposed by the petition. Several comments pointed out that the suggested ingredient requirements would result in a product unnecessarily high in fat and cholesterol. FDA received no comments that offered reasons to pursue a rulemaking to establish a standard of identity for dessert mousse.

Having reviewed the petition and having considered the comments received and other relevant information, FDA has concluded that the petitioner has not shown reasonable grounds for promulgation of the requested regulation for dessert mousse under the authority of section 401 of the act (21 U.S.C. 341).

Therefore, in accordance with 21 CFR 10.30(e) and 21 U.S.C. 371(e), the Commissioner of Food and Drugs is denying the petition requesting establishment of a standard of identity for dessert mousse. This action is without prejudice to further consideration of the development of a U.S. standard for dessert mousse upon appropriate justification.

Dated: April 4, 1989.

Ronald G. Chesemore,

Acting Associate Commissioner for  
Regulatory Affairs.

[FR Doc. 89-8476 Filed 4-10-89; 8:45 am]

BILLING CODE 4160-01-M

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### Policy on Wetlands of International Importance

**AGENCY:** Fish and Wildlife Service,  
Interior.

**ACTION:** Notice.

**SUMMARY:** This notice contains draft policy and guidelines for the nomination of additional sites to the List of Wetlands of International Importance (List). This action is taken in accordance with the articles of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat, to which the United States is a full party. These guidelines are needed to (1) ensure consistent and effective Fish and Wildlife Service (Service) recommendations; and (2) allow mechanisms for appropriate review of proposed site nominations.

**DATE:** Comments on the draft policy and guidelines will be received no later than June 12, 1989.

**ADDRESS:** Comments on the proposed policy and guidelines may be submitted to: Director, U.S. Fish and Wildlife Service, Department of the Interior, 18th & C Streets NW., Washington, DC 20240. Attn: Office of International Affairs.

**FOR FURTHER INFORMATION CONTACT:** Thomas Dahl, U.S. Fish and Wildlife Service, Broyhill Building, Suite 500, Washington, DC 20240; telephone (703) 358-2201, (FTS) 358-2201.

**SUPPLEMENTARY INFORMATION:** The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Convention), was concluded in Ramsar, Iran, February 2, 1971. A Protocol to the Convention was concluded in Paris on December 3, 1982. The Convention was signed by the United States on September 13, 1985. The President signed instruments of ratification on November 10, 1986, and these documents were deposited with the United Nations on January 18, 1987. The United States became a full party to the Convention on April 18, 1987.

One aspect of the Convention is its requirement that parties identify wetlands of international importance and list them under the auspices of the Convention. The listing serves to highlight the values of these sites but affects neither the management regime for these areas nor resource use within them. Contracting Parties to the Convention are to formulate and implement their planning so as to promote the conservation of the wetlands included in the List and as far as possible the wise use of wetlands in their territory. Further, Contracting Parties are obliged to maintain the ecological character of those wetland areas included in the List. If changes in the ecological character resulting from technological developments, pollution or other human interference occurs, the

Contracting Party is to forward notification to all Contracting Parties and arrange for these matters to be discussed at the next Conference. Countries joining the Convention are required to list at least one wetland of international importance based upon the following criteria established by the Convention. These criteria are provided for information:

**Criteria for Identifying Wetlands of International Importance—Regina, Canada 1987**

A wetland is suitable for inclusion in the list if it meets any one of the criteria set out below:

1. Criteria for assessing the value of representative or unique wetlands. A wetland should be considered internationally important if it is a particularly good example of a specific type of wetland characteristic of its region.

2. General criteria for using plants or animals to identify wetlands of importance. A wetland should be considered internationally important if:

- (a) It supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plants or animals, or an appreciable number of individuals of any one or more of these species;
- or (b) It is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna;
- or (c) It is of special value as the habitat of plants or animals at a critical stage of their biological cycles;
- or (d) It is of special value for its endemic plant or animal species or communities.

3. Specific criteria for using waterfowl to identify wetlands of importance.

A wetland should be considered internationally important if:

- (a) It regularly supports 20,000 waterfowl;
- or (b) It regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity;
- or (c) Where data on populations are available, it regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.

Using earlier versions of the criteria endorsed by the Convention of Parties, the United States has nominated, and the Conference of Parties has accepted, seven sites to the List of Wetlands of International Importance. These are: Ash Meadows National Wildlife Refuge, Nevada

Forsythe National Wildlife Refuge, New Jersey  
Okefenokee National Wildlife Refuge, Georgia/Florida  
Izembek National Wildlife Refuge and State Game Range, Alaska  
Everglades National Park, Florida  
Chesapeake Bay Wetlands System, Maryland/Virginia  
Cheyenne Bottoms Wildlife Area, Kansas

The policy for nominating Wetlands of International Importance is set forth as follows. Public comments concerning this policy are requested no later than 60 days after publications of this notice.

**I. Purpose**

The purpose of this notice is to establish U.S. Fish and Wildlife Service policy, guidelines and procedures for nominating sites to the List of Wetlands of International Importance. It provides supplemental guidance to the Convention criteria for determining site eligibility.

**II. Authority**

The authority for establishment of these guidelines flows from the United States Senate ratification of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat, which is deemed to be self implementing.

**III. Scope**

This policy is limited to evaluation of proposed sites for nomination to the List of Wetlands of International Importance. It is not intended for any other use.

**IV. Policy of the U.S. Fish and Wildlife Service on Wetlands of International Importance**

The Service's commitment to wetlands conservation is addressed in a number of documents, most recently the National Wetlands Priority Conservation Plan. The Fish and Wildlife Service Policy and Guidelines on Wetlands of International Importance was developed to ensure compliance with the Protocol and articles of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat. In reviewing sites eligible for inclusion to the List, it will be the policy of the Service to consider for nomination only those sites where: (1) the ownership rights are free from encumbrances or dispute and the lands are in public or private management that is conducive to the conservation of wetlands; (2) maintenance of the ecological and hydrological characteristics of the site(s) should be reasonably assured such that future

actions would not result in de-listing by the Conference of Parties; and (3) proposed sites will only be considered if there is concurrence from the State, Commonwealth or territory where the site(s) is (are) located.

**V. Description of Guidelines for Site Nomination**

In order to solicit appropriate nominations to the List of Wetlands of International Importance, the Service will publish an annual Action Notice in the **Federal Register**. The Action Notice will specify the time frame for submissions and where materials may be sent. Nominations can be made only by the appropriate administrative authority for a site. For the purpose of nominating sites, the appropriate administrative authority is defined as the party holding title to the land area. Nominations must have the endorsement/concurrence from the State(s), Commonwealth or territory in which the site is located. Supporting information for site nominations should include the following:

*Nominating Authority.* Include name, address and other pertinent information on the administrative authority submitting the site nomination.

*Geographical Location.* Details such as latitude and longitude coordinates, and nearby features, settlements, and other identifying characteristics should be provided. In addition, include detailed maps of both the site as well as the surrounding areas if they are available.

*Site Description.* This section comprises both a physical and a biological description of the site. The physical description includes details of geomorphology, hydrology and climate, while the biological description includes a brief review of habitat types, with lists of both typical and noteworthy fauna and flora.

*Criteria for Inclusion.* Specify the criterion(a) as listed by the Convention of Parties, that qualifies the site as a Wetland of International Importance. Highlight those factors for which the site has been generally considered to be of particular importance.

*Area.* Identify the total area (in hectares) of the proposed site including information on terrestrial and aquatic components.

*Management Practices.* Note management practices and traditional activities that take place.

*Changes in Ecological Character.* Give a brief synopsis of the natural history of the area and note any land use changes or impacts to the ecological functions or character of the area.

**Degree of Protection.** Note any State, local, national or international recognition or designation afforded to the site. Indicate if any activities are controlled or prohibited.

**Scientific Research and Facilities.** Highlight research underway or facilities provided (if any) for research interests.

**Reference Material.** Note any key publications, reports, or documents used to compile the information presented. This is not intended to be a complete reference list.

The Service will coordinate review of proposed site(s) for inclusion to the List with the appropriate State, Federal and non-governmental organizations. It is not the intention of the Service to maintain a standing backlog of sites for nomination, but rather to solicit prospective sites from the Federal and State agencies, private organizations and the scientific community via the Action Notice procedures described above.

Once reviewed, those nominations that adhere to the criteria and policies set forth above will be formally presented to the Convention Secretariat by the Director of the U.S. Fish and Wildlife Service.

Action taken by the Secretariat will be announced in the annual Action Notice described previously in Section V. Management authorities for nominated sites will be forwarded information on actions taken by the Secretariat immediately.

Date: April 4, 1989.

Susan R. Lamson,

Deputy Assistant Secretary.

[FR Doc. 89-8481 Filed 4-10-89; 8:45am]

BILLING CODE 4310-55-M

## Bureau of Land Management

[CA-940-09-; CACA 7300 WR, CARI 01561 WR]

### Termination of Small Tract Classification Nos. 263, 495; California

**AGENCY:** Bureau of Land Management, Interior.

**ACTION:** Termination of small tract classification.

**SUMMARY:** This action terminates Small Tract Classifications Nos. 263 and 495 which classified public land for disposition pursuant to the Small Tract Act of 1938. The Small Tract Act of 1938 was repealed by the Federal Land Policy and Management Act, 90 Stat. 2743 dated October 21, 1976, therefore, the classification is moot. Removal of the classification will allow completion of

two public sales held under Section 203 of the Federal Land Policy and Management Act.

**FOR FURTHER INFORMATION CONTACT:** Judy Bowers, BLM California State Office, 2800 Cottage Way, Room E-2841, Federal Office Building, Sacramento, California 95825 (916) 978-4815.

1. Pursuant to the authority delegated by Appendix 1 of Bureau of Land Management Manual 1203 dated April 14, 1987, Small Tract Classification Nos. 263 and 495 are hereby terminated as to the following lands:

#### San Bernardino Meridian

*Small Tract No. 495*

T. 4 N., R. 14 W.,

Sec. 5, lot 22.

*Small Tract No. 263*

T. 5 N., R. 13 W.,

Sec. 6, lots 18, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32;

Sec. 7, lots 6, 7.

The areas described contain 179.67 acres.

2. The classification segregated the public lands from all other forms of appropriation under the public land laws, including location under the United States mining laws, but not leasing under the mineral leasing laws, pursuant to the Act of June 1, 1938 (52 Stat. 609; 43 U.S.C. 682a), as amended. The Small Tract Act of 1938 was repealed by section 702 of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2789); the classification therefore no longer serves a useful purpose as to the land described above.

3. Accordingly, at 10 a.m. on April 17, 1989, the lands described in paragraph 1 will be opened to operation of the public land laws, generally, and the United States mining laws, subject to valid existing rights, the provisions of existing withdrawals and classifications, and the requirements of applicable law.

Ed Hastey,

State Director.

[FR Doc. 89-8478 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

[AK-967-4230-15; AA-6703-A2]

### Alaska Native Claims Selection; Tatitlek Corp.

In accordance with Departmental regulations 43 CFR 2650.7(d), notice is hereby given that a decision to issue conveyance under the provisions of section 14(a) of the Alaska Native Claims Settlement Act of December 18, 1971, 43 U.S.C. 1601, 1613(a), will be issued to the Tatitlek Corporation for

133.50 acres. The lands involved are in the vicinity of Tatitlek, Alaska.

#### Copper River Meridian, Alaska

T. 12 S., R. 9 W.

(Surveyed)

A notice of the decision will be published once a week, for four (4) consecutive weeks, in the Cordova Times. Copies of the decision may be obtained by contacting the Alaska State Office of the Bureau of Land Management, 222 West Seventh Avenue, # 13, Anchorage, Alaska 99513-7599 (907) 271-5960).

Any party claiming a property interest which is adversely affected by the decision, an agency of the Federal government or regional corporation, shall have until May 11, 1989, to file an appeal. However, parties receiving service by certified mail shall have 30 days from the date of receipt to file an appeal. Appeals must be filed in the Bureau of Land Management at the address identified above, where the requirements for filing an appeal may be obtained. Parties who do not file an appeal in accordance with the requirements of 43 CFR Part 4, Subpart E, shall be deemed to have waived their rights.

Patricia A. Baker,

Acting Chief, Branch of KCS Adjudication.

[FR Doc. 89-8469 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-JA-M

[UT-020-09-4212-13; U-61686]

### Salt Lake District; Realty Action; Exchange of Public Lands in Tooele and Box Elder Counties, Utah

The following described lands have been determined to be suitable for disposal by exchange under section 206 of the Federal Land Policy and Management Act of 1976 (90 Stat. 2756; 43 U.S.C. 1716):

T. 1 S., R. 11 W., SLM, Ut,

Section 30: All, 616.36

Section 31: All, 617.36

T. 1 S., R. 10 W., SLM, Ut,

Section 4: S $\frac{1}{2}$ NE $\frac{1}{4}$ , E $\frac{1}{2}$ E $\frac{1}{2}$ SW $\frac{1}{4}$ , E $\frac{1}{2}$

W $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$

SE $\frac{1}{4}$ , W $\frac{1}{2}$ E $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ , 200

Section 9: W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , W $\frac{1}{2}$ W $\frac{1}{2}$

SW $\frac{1}{4}$ NE $\frac{1}{4}$ E $\frac{1}{2}$ NW $\frac{1}{4}$ , E $\frac{1}{2}$ E $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ ,

E $\frac{1}{2}$ SW $\frac{1}{4}$ , E $\frac{1}{2}$ W $\frac{1}{2}$ SW $\frac{1}{4}$ , 240

totalling 1673.72 acres.

In exchange for these lands, the United States will acquire the following described lands from Aptus Environmental Services of Salt Lake City, Utah:

T. 10N. R. 4W., SLM

Section 19: All, 651.40

Section 29: All, 640



Section 31: All, 641.34  
 T. 10N., R. 16W., SLM  
 Section 3: All, 642.16  
 T. 11N., R. 16W., SLM  
 Section 29: All, 640  
 Section 33: All, 640  
 T. 9N., R. 17W., SLM  
 Section 13: NE $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ , 200  
 T. 4N., R. 19W., SLM  
 Section 1: All, 640.4  
 Section 13: W $\frac{1}{2}$ , 320  
 Section 15: W $\frac{1}{2}$ W $\frac{1}{2}$ , 160  
 Section 25: W $\frac{1}{2}$ , 320  
 T. 5N., R. 19W., SLM  
 Section 9: E $\frac{1}{2}$ N $\frac{1}{2}$ NW $\frac{1}{4}$ , S $\frac{1}{2}$ SW $\frac{1}{4}$ , 480  
 Section 17: Lots 1-3, 32.06  
 Section 21: E $\frac{1}{2}$ E $\frac{1}{2}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$ , 240  
 Section 25: All, 640  
 Section 33: E $\frac{1}{2}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , 360  
 T. 6N., R. 19W., SLM  
 Section 11: All, 640  
 Section 13: All, 640  
 Section 15: All, 614.70  
 Section 21: All, 640  
 Section 25: All, 640  
 Section 35: All, 640  
 T. 7N., R. 19W., SLM  
 Section 25: All, 640  
 Section 27: All, 639  
 T. 8 S., R. 7 W., SLM, Ut,  
 Section 12, SE $\frac{1}{4}$ SE $\frac{1}{4}$ , 40  
 Section 13, NE $\frac{1}{4}$ NE $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ , 80  
 T. 9 S., R. 18 W., SLM, Utah  
 Sections 8 and 17, Mineral Survey #6311, 61.515  
 T. 9 S., R. 18 W., SLM, Utah  
 Sections 27, 28, 33, and 34, Mineral Survey #3697, 100  
 comprising 12,622.575 acres.

The purpose of this exchange is to acquire non-Federal lands which contain high public values for threatened and endangered species habitat, wildlife, recreation, wetlands and wilderness. The exchange would create a more logical and efficient land management pattern. The public interest will be served by completing the exchange.

The value of the lands to be exchanged are approximately equal; full equalization of values will be achieved either by an adjustment in the acreage or by payment to the United States of funds in an amount not to exceed 25 percent of the total value of the lands to be transferred out of Federal ownership.

Lands to be transferred from the United States will contain the following reservations:

(1) A right-of-way thereon for ditches and canals constructed by the authority of the United States, pursuant to the Act of August 30, 1890 (26 Stat. 391; 43 U.S.C. 945).

(2) All minerals, along with the right of ingress and egress for exploration and development.

The transfer of land from the United States will also be made subject to following existing rights:

(1) The Western Pacific Railroad mainline, serialized as SL-062680, which affects section 4, T. 1 S., R. 10 W., and section 30, T. 1 S., R. 11 W., SLM.

(2) A buried fiberoptic telephone cable identified as U-58148, granted to U.S. Sprint, which parallels the Western Pacific rail line.

Publication of this notice segregates the public lands from the operation of all other public land laws, including the general mining laws, for a period of 2 years from the date of first publication.

Further information concerning the exchange is available for review at the Salt Lake District Office.

For a period of 45 days from the date of first publication, interested parties may submit comments to the Salt Lake District Office, 2370 South 2300 West, Salt Lake City, Utah 84119.

Deane H. Zeller,

*Salt Lake District Manager.*

[FR Doc. 89-8470 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-DQ-M

#### [CA-940-09-4520-12; Group 883]

#### Notice of Plat of Survey

March 24, 1989.

1. This plat of the following described land will be officially filed in the California State Office, Sacramento, California, immediately:

Mount Diablo Meridian, Colusa County

T. 16 N., R. 7 W.

2. This plat, representing the dependent resurvey of the east boundary, portions of the west and north boundaries, and a portion of the subdivisional lines, and the survey of the subdivision of sections 4, 5, 7, 8, 9, 16, 17, 18, and 21, Township 16 North, Range 7 West, Mount Diablo Meridian, California, under Group No. 883 California, was accepted February 14, 1989.

3. This plat will immediately become the basic record of describing the land for all authorized purposes. This plat has been placed in the open files and is available to the public for information only.

4. This plat was executed to meet certain administrative needs of the Mendocino National Forest.

5. All inquiries relating to this land should be sent to the California State Office, Bureau of Land Management, Federal Office Building, 2800 Cottage Way, Room E-2841, Sacramento, California, 95825.

Herman J. Lyttge,

*Chief, Public Information Section*

[FR Doc 89-8486 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

#### [CA-940-09-4520-12; C-4-89]

#### Notice of Filing of Plat of Survey

March 24, 1989.

1. This supplemental plat of the following described land will be officially filed in the California State Office, Sacramento, California, immediately:

San Bernardino Meridian, San Diego County

T. 9 S., R. 2 W.

2. This supplemental plat of the W $\frac{1}{2}$  of section 13, and section 14, Township 9 South, Range 2 West, San Bernardino Meridian, California, was accepted February 8, 1989.

3. This supplemental plat will immediately become the basic record of describing the land for all authorized purposes. This plat has been placed in the open files and is available to the public for information only.

4. This supplemental plat was executed to meet certain administrative needs of the Bureau of Land Management.

5. All inquiries relating to this land should be sent to the California State Office, Bureau of Land Management, Federal Office Building, 2800 Cottage Way, Room E-2811, Sacramento, California, 95825.

Herman J. Lyttge,

*Public Information Section.*

[FR Doc. 89-8487 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

#### [CA-940-09-4520-12; Group 697]

#### Notice of Plat of Survey

March 24, 1989.

1. This plat of the following described land will be officially filed in the California State Office, Sacramento, California, immediately:

Mount Diablo Meridian, Trinity County

T. 33 N., R. 10 W.

2. This plat, representing the dependent resurvey of a portion of the south, east, west, and north boundaries, a portion of the subdivisional lines, certain boundaries of mineral surveys, a portion of the subdivision of section 32, and the survey of the subdivision of sections 1, 3, 4, 5, 8, 9, 17, 18, 19, 30, 31, and 32, and the metes-and-bounds survey of Tract Nos. 66 and 67, and Lot 14 of section 8, Township 33 North, Range 10 West, Mount Diablo Meridian, California, under Group No. 697 California, was accepted February 8, 1989.

3. This plat will immediately become the basic record of describing the land

for all authorized purposes. This plat has been placed in the open files and is available to the public for information only.

4. This plat was executed to meet certain administrative needs of the Shasta Trinity National Forest.

5. All inquiries relating to this land should be sent to the California State Office, Bureau of Land Management, Federal Office Building, 2800 Cottage Way, Room E-2841, Sacramento, California, 95825.

Herman J. Lyttge,

Chief, Public Information Section.

[FR Doc. 89-8488 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

[CA-940-09-4520-12; Group 910]

### Notice of Plat of Survey

March 23, 1989.

1. This plat of the following described land will be officially filed in the California State Office, Sacramento, California immediately:

Mount Diablo Meridian, Trinity County

T. 33 N., R. 11 W.

2. This plat, representing the dependent resurvey of a portion of the subdivisional lines and certain boundaries of mineral surveys, and the survey of the subdivision of section 12, Township 33 North, Range 11 West, Mount Diablo Meridian, California, under Group 910 California, was accepted February 8, 1989.

3. This plat will immediately become the basic record of describing the land for all authorized purposes. This plat has been placed in the open files and is available to the public for information only.

4. This plat was executed to meet certain administrative needs of the Shasta-Trinity National Forest.

5. All inquiries relating to this land should be sent to the California State Office, Bureau of Land Management, Federal Office Building, 2800 Cottage Way, Room E-2841, Sacramento, California 95825.

Herman J. Lyttge,

Chief, Public Information Section.

[FR Doc. 89-8489 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

[CA-940-09-4520-12; Group 952]

### Notice of Plat of Survey

March 24, 1989

1 This plat of the following described land will be officially filed in the California State Office, Sacramento, California immediately

Mount Diablo Meridian, Yolo County

T. 8 N., R. 2 W.

2. This plat, representing the dependent resurvey of a portion of the subdivisional lines and the survey of the subdivision of section 20, Township 8 North, Range 2 West, Mount Diablo Meridian, California, under Group No. 952 California, was accepted February 22, 1989.

3. This plat will immediately become the basic record of describing the land for all authorized purposes. This plat has been placed in the open files and is available to the public for information only.

4. This plat was executed to meet certain administrative needs of the Bureau of Land Management.

5. All inquiries relating to this land should be sent to the California State Office, Bureau of Land Management, Federal Office Building, 2800 Cottage Way, Room E-2841, Sacramento, California 95825.

Herman J. Lyttge,

Chief, Public Information Section.

[FR Doc. 89-8490 Filed 4-10-89; 8:45 am]

BILLING CODE 4310-40-M

## INTERSTATE COMMERCE COMMISSION

[Docket No. AB-3 (Sub-No. 82X)]

### Missouri Pacific Railroad Co.; Abandonment Exemption Between Gypsum and Salina in Saline County, KS

AGENCY: Interstate Commerce Commission.

ACTION: Notice of Exemption.

SUMMARY: The Interstate Commerce Commission exempts under 49 U.S.C. 10505 the abandonment by Missouri Pacific Railroad Company of approximately 11.4 miles of railroad between milepost 479.2 near Gypsum and milepost 490.6 near Salina, in Saline County, KS, from the prior approval requirements of 49 U.S.C. 10903, *et seq.*, subject to standard labor protection conditions.

DATES: Provided no formal expression of intent to file an offer of financial assistance has been received, this exemption will be effective on May 11, 1989. Formal expressions of intent to file an offer<sup>1</sup> of financial assistance under

<sup>1</sup> See *Exempt of Rail Abandonment—Offers of Finan Assist.* 4 I.C.C.2d 104 (1987), and final rules published in the *Federal Register* on December 22, 1987 (52 FR 48440-48446)

49 CFR 1152.27(c)(2) must be filed by April 21, 1989, petitions to stay must be filed by April 26, 1989, and petitions for reconsideration must be filed by May 8, 1989. Requests for a public use condition must be filed by April 21, 1989.

ADDRESSES: Send pleadings referring to Docket No. AB-3 (Sub-No. 82X) to:

(1) Office of the Secretary Case Control Branch, Interstate Commerce Commission, Washington, DC 20423, and

(2) Petitioner's representatives: Joseph D. Anthofer Jeanna L. Regier, 1416 Dodge Street, Omaha, NE 68179

### FOR FURTHER INFORMATION CONTACT:

Joseph H. Dettmar, (202) 275-7245.

[TDD for hearing impaired (202) 275-1721]

### SUPPLEMENTARY INFORMATION:

Additional information is contained in the Commission's decision. To purchase a copy of the full decision, write to, call, or pick up in person from: Dynamic Concepts, Inc., Room 2229, Interstate Commerce Commission Building, Washington, DC 20423. Telephone: (202) 289-4357/4359.

[Assistance for the hearing impaired is available through TDD Service (202) 275-1721.]

Decided: April 3, 1989.

By the Commission, Chairman Gradison, Vice Chairman Simmosn, Commissioners Andre, Lamboley, and Phillips.

Noreta R. McGee,

Secretary.

[FR Doc. 89-8522 Filed 4-10-89; 8:45 am]

BILLING CODE 7035-01-M

## DEPARTMENT OF JUSTICE

### Joint Newspaper Operating Agreement

Notice is hereby given that the Attorney General, on April 3, 1989, issued an Opinion and Orders relating to an application for a Joint Operating Agreement between the Manteca News and Manteca Bulletin, filed pursuant to the Newspaper Preservation Act, 15 U.S.C. 1801 *et seq.*

The Opinion responded to motions by both newspapers for confidential treatment of documents that has been provided with the initial application and with later submissions. The Attorney General has granted the newspapers' motions, in part, and denied them, in part. In order to provide the public with the opportunity to respond to information which previously had been withheld, the Attorney General has extended until July 31, 1989, the period for public comment and the period by

which the Antitrust Division must file its report. The period in which persons may reply in writing to the report of the Antitrust Division and to other comments is extended until August 30, 1989. Comments should be filed by mailing or delivering five copies to the Assistant Attorney General, Justice Management Division, Department of Justice, Washington, DC 20530.

Date: April 3, 1989.

Harry H. Flickinger,  
Assistant Attorney General for  
Administration.

[FR Doc. 89-8485 Filed 4-10-89; 8:45 am]

BILLING CODE 4410-01-M

### Lodging of Consent Decree Pursuant to the Clean Air Act

In accordance with Department policy, 28 CFR 50.7, notice is hereby given that on April 4, 1989, a proposed consent decree in *United States of America v. Gary L. Heldt*, Civil Action No. 86-4102, was lodged with the United States District Court for the District of South Dakota.

The proposed consent decree resolves a cost recovery action brought by the United States, on behalf of the Environmental Protection Agency ("EPA"), pursuant to sections 104(a) and 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. 9604(a), 9607(a). The complaint filed by the United States seeks recovery of costs incurred in responding to a release of hazardous substances, pollutants and contaminants at a facility formerly owned by defendant. The release occurred as the result of efforts to extinguish a fire at defendant's farm chemical warehouse in Brookings, South Dakota. Defendant has brought counterclaims (whose subsequent dismissal has been appealed) against the United States and certain EPA officials, together with third-party claims against EPA response action contractors. Those claims seek damages allegedly suffered by defendant as a result of the conduct of clean-up efforts.

The proposed consent decree provides that defendant will pay \$375,000 of the United States' response costs, which total approximately \$1.3 million.

In consideration for defendant's payment of response costs, the United States covenants not to sue defendant for any claim arising out of the contamination caused by the fire. In addition, defendant agrees to release any claims against the United States, EPA and its contractors. Similarly, the contractors agree to mutual releases of

one another and to release claims against defendant and against the United States and EPA.

The Department of Justice will receive for a period of thirty (30) days from the date of this publication comments relating to the proposed consent decree. Comments should be addressed to the Assistant Attorney General, Land and Natural Resources Division, Department of Justice, Washington, DC 20530, and should refer to *United States of America v. Gary L. Heldt*, D.O.J. Ref. 90-11-3-108.

The proposed consent decree may be examined at the office of the United States Attorney, District of South Dakota, 135 Federal Building & U.S. Courthouse, 400 S. Phillips Avenue, P.O. Box 1073, Sioux Falls, South Dakota 57101, and at the Region VIII office of the Environmental Protection Agency, Office of Regional Counsel, Attention: Thomas A. Speicher, 999 18th Street—Suite 500, Denver, Colorado 80202-2405. A copy of the proposed consent decree may also be examined at the Environmental Enforcement Section, Land and Natural Resources Division, U.S. Department of Justice, Room 1521, Ninth Street and Pennsylvania Avenue, NW., Washington, DC 20530. A copy of the proposed consent decree may be obtained in person or by mail from the Environmental Enforcement Section, Land & Natural Resources Division, Department of Justice.

Donald A. Carr,

Acting Assistant Attorney General, Land and Natural Resources Division, U.S. Department of Justice, 10th & Pennsylvania, NW., Washington, DC 20530.

[FR Doc. 89-8484 Filed 4-10-89; 8:45 am]

BILLING CODE 4410-01-M

### NUCLEAR REGULATORY COMMISSION

#### Privacy Act of 1974; Systems of Records; Report of Disclosures

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notification of disclosures.

**SUMMARY:** The Nuclear Regulatory Commission (NRC) is proposing to amend two of its Systems of Records (NRC-20 and NRC-21) to reflect the Debt Collection Act of 1982 requirement that a notice under the Privacy Act be made indicating that information in a System of Records may be disclosed to a consumer reporting agency in order to enhance NRC's debt collection abilities. NRC-21 is also being revised to reflect the withholding and reporting of Thrift Savings Plan deductions to the Department of Agriculture's National

Finance Center. Other minor amendments are also being made.

**EFFECTIVE DATE:** The proposed disclosures will take effect without further notice on May 11, 1989, unless comments received on or before that date require a different decision. If, based on NRC's review of comments received, changes are made, NRC will publish a new notice.

**ADDRESSES:** Send comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. Copies of comments may be examined at the NRC Public Document Room at 2120 L Street, NW, Washington, DC.

**FOR FURTHER INFORMATION CONTACT:** David L. Meyer, Chief, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555; Telephone: 301-492-7086 or toll free 800-368-5642.

**SUPPLEMENTARY INFORMATION:** The Debt Collection Act of 1982 (Pub. L. 97-365), which was enacted on October 25, 1982, revised the Federal Claims Collection Act of 1966 (31 U.S.C. 3701 et seq.). The Act provides government agencies with additional procedures for the collection of debts owed to the United States. Among these procedures, the Act authorizes government agencies to make disclosures that would permit agencies to take advantage of debt collection services and techniques commonly available to the private sector such as turning delinquent debts over to collection agencies and charging interest for delinquent accounts.

The Act required the Department of Justice and the General Accounting Office to promulgate standards necessary to implement its provisions. On March 9, 1984 (49 FR 8889), the Department of Justice and the General Accounting Office jointly published a final rule amending the Federal Claims Collection Standards set out in 4 CFR Parts 101-105 to reflect the requirements of the Act. The NRC published a proposed rule on October 7, 1988 (53 FR 39480) that would amend 10 CFR Part 15 to implement the provisions of the Debt Collection Act of 1982 and the Federal Claims Collection Standards.

The Debt Collection Act of 1982 also amended the Privacy Act of 1974 to provide a new general disclosure authority that permits agencies to disclose information from certain of their Systems of Records concerning individuals who are in default. This

amendment of the Privacy Act would permit the disclosure of information to both debt collection agencies and credit reporting agencies. Before these disclosures can be made, agencies are required to go through certain due process steps that ensure the valid nature of the claim and give the individual the opportunity to resolve the claim.

Before the NRC can take advantage of the additional options afforded by the Debt Collection Act of 1982, and before NRC can issue the amendments to 10 CFR Part 15 in final form, the NRC must update the uses of its Systems of Records to comply with the amended provisions of the Privacy Act. This notice indicates the Systems of Records from which the NRC intends to disclose debtor information.

Under the NRC's Systems of Records, NRC-20, Official Travel Records, and NRC-21, Payroll Accounting Records, are being revised to provide for the reporting of delinquent debts to consumer reporting agencies, notifying debtors of these actions, reporting debt status changes to debtors, and limiting the information which the NRC may provide to consumer reporting agencies. Disclosure of information to a consumer reporting agency is not considered a routine use of records. Disclosures may be made to consumer reporting agencies as defined in the Fair Credit Reporting Act (15 U.S.C. 1681a(f)) or the Federal Claims Collection Act of 1966 (31 U.S.C. 3701(a)(3)). NRC-21 is also being revised to reflect the withholding and reporting of Thrift Savings Plan deductions to the Department of Agriculture's National Finance Center. Other minor revisions dealing with office name and location changes are also being made.

A report for each System of Records, required by 5 U.S.C. 552a(o), as implemented by OMB Circular A-130, was sent to the Committee on Government Operations of the United States House of Representatives, Committee on Governmental Affairs of the United States Senate, and the Office of Management and Budget on February 14, 1989.

In response to a letter from Bob Wise, Chairman, Subcommittee on Government Information, Justice, and Agriculture, Committee on Government Operations, the notice was changed to reflect revisions made in the routine use section concerning consumer reporting notices.

1. NRC-20, Official Travel Records—NRC, is being amended to read as follows:

**NRC-20**

\* \* \* \* \*

**SYSTEM LOCATION**

Primary system—Division of Accounting and Finance, Office of the Controller, NRC, 7735 Old Georgetown Road, Bethesda, Maryland.

\* \* \* \* \*

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES: INFORMATION IN THESE RECORDS MAY BE USED**

- a. For transmittal to the U.S. Treasury for payment;
- b. For transmittal to the Department of State or an embassy for passports or visas;
- c. For any of the routine uses specified in the Prefatory Statement.

**DISCLOSURES TO A CONSUMER REPORTING AGENCY**

*Disclosures pursuant to 5 U.S.C. 552a(b)(12)*

Disclosure of information to a consumer reporting agency is not a routine use of records. Disclosures may be made from this system to consumer reporting agencies as defined in the Fair Credit Reporting Act (15 U.S.C. 1681a(f)) or the Federal Claims Collection Act of 1966, as amended (31 U.S.C. 3701(a)(3)).

\* \* \* \* \*

**SYSTEM MANAGER(S) AND ADDRESS**

Director, Division of Accounting and Finance, Office of the Controller, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

**NOTIFICATION PROCEDURES**

Director, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

\* \* \* \* \*

2. NRC-21, Payroll Accounting Records—NRC, is being amended to read as follows:

**NRC-21**

\* \* \* \* \*

**SYSTEM LOCATION**

Primary system—Division of Accounting and Finance, Office of the Controller, NRC, 7735 Old Georgetown Road, Bethesda, Maryland.

\* \* \* \* \*

**ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:**

\* \* \* \* \*

b. For reporting tax withholding to Internal Revenue Service and appropriate State and local taxing authorities;

\* \* \* \* \*

k. For withholding and reporting of Thrift Savings Plan deductions to the Department of Agriculture's National Finance Center;

1. For any of the routine uses specified in the Prefatory Statement.

**DISCLOSURES TO A CONSUMER REPORTING AGENCY**

*Disclosures pursuant to 5 U.S.C. 552a(b)(12)*

Disclosure of information to a consumer reporting agency is not considered a routine use of records. Disclosures may be made from this system to consumer reporting agencies as defined in the Fair Credit Reporting Act (15 U.S.C. 1681a(f)) or the Federal Claims Collection Act of 1966, as amended (31 U.S.C. 3701(a)(3)).

\* \* \* \* \*

**SYSTEMS MANAGER(S) ADDRESS**

Director, Division of Accounting and Finance, Office of the Controller, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

**NOTIFICATION PROCEDURES**

Director, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

**RECORD SOURCE CATEGORIES**

Information is provided by individual and the Office of Personnel.

Dated at Rockville, Maryland, this 5th day of April 1989.

For the Nuclear Regulatory Commission.

Victor Stello, Jr.,

*Executive Director for Operations.*

[FR Doc. 89-8499 Filed 4-10-89; 8:45 am]

**BILLING CODE 7590-01-M**

[Docket No. 50-334]

**Duquesne Light Co; Issuance of Amendment to Facility Operating License**

In the matter of Duquesne Light Company Ohio Edison Company, and Pennsylvania Power Company

The U.S. Nuclear Regulatory Commission (Commission) has issued Amendment No. 138 to Facility Operating License No. DPR-66, issued to Duquesne Light Company, et al. (the licensee). The amendment revises the

Technical Specifications for operation of the Beaver Valley Power Station, Unit 1, located in Shippingport, Pennsylvania. The amendment is effective as of the date of issuance, to be implemented within 60 days of issuance.

The amendment revises the applicable engineered safety feature response times specified in Table 3.5-5 to include the time required for suction switchover from the volume control tank to the refueling water storage tank.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment.

Notice of Consideration of Issuance of Amendment and Opportunity for Prior Hearing in connection with this action was published in the **Federal Register** on January 7, 1988 (53 FR 459). No request for a hearing or petition for leave to intervene was filed following this notice.

The staff has prepared an Environmental Assessment related to the action and has determined not to prepare an environmental impact statement. Based upon the environmental assessment, the staff has concluded that the issuance of the amendment will not have a significant effect on the quality of the human environment.

For further details with respect to the section, see (1) the application for amendment dated November 12, 1987, (2) supplement dated January 1989 (Accession No. 8901180050), (3) Amendment No. 138 to License No. DPR-66, (4) the staff's related Safety Evaluation and, (5) the staff's Environmental Assessment. All of these items are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street NW., Washington, DC, and the B.F. Jones Memorial Library, 663 Franklin Avenue, Aliquippa, Pennsylvania 15001. A copy of items (3), (4) and (5) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Director, Division of Reactor Projects I/II.

Dated at Rockville, Maryland this third day of April, 1989.

For the Nuclear Regulatory Commission.  
**Peter S. Tam,**

Senior Project Manager, Project Directorate I-4, Division of Reactor Projects I/II, Office of Nuclear Reactor Regulation.

[FR Doc. 89-8500 Filed 4-10-89; 8:45 am]

BILLING CODE 7590-01-M

## SECURITIES AND EXCHANGE COMMISSION

[Release No. 34-26696; Files No. SR-CBOE-89-7; SR-PHLX-89-19; and SR-PSE-89-4]

### Self-Regulatory Organizations; Chicago Board Options Exchange, Inc.; Philadelphia Stock Exchange, Inc.; and Pacific Stock Exchange, Inc.; Filing and Order Granting Temporary Accelerated Approval to Proposed Rule Change

Pursuant to section 19(b)(1) of the Securities Exchange Act of 1934, 15 U.S.C. 78s(b)(1), notice is hereby given that on March 20, 1989, March 20, 1989, and March 22, 1989, respectively, the Chicago Board Options Exchange, Inc. ("CBOE"), the Philadelphia Stock Exchange, Inc. ("Phlx"), and the Pacific Stock Exchange, Inc. ("PSE") filed with the Securities and Exchange Commission ("Commission") the proposed rule changes as described in Items I, II, and III below, which Items have been prepared by the self-regulatory organizations ("SROs").

#### I. Self-Regulatory Organizations' Statement of the Terms of Substance of the Proposed Rule Change

The SROs propose to extend the current margin requirements for short equity and index options positions through July 17, 1989. The SROs current margin requirements were approved in Securities Exchange Act Release No. 25701 (May 17, 1988), 53 FR 20706, for a six-month period. In Securities Exchange Act Release No. 26381 (December 21, 1988), 53 FR 52541, the SROs' margin requirements were extended for an additional three-month period.

#### II. Self-Regulatory Organizations' Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In their filings with the Commission, the SROs included statements concerning the purpose of and basis for the proposed rule changes. The text of these statements may be examined at the places specified in Item IV below. The SROs have prepared summaries, set forth in sections (A), (B), and (C) below, of the most significant aspects of such statements.

#### A. Self-Regulatory Organizations' Statements of the Purpose of, and Statutory Basis for, the Proposed Rule Changes

On May 17, 1988, the Commission approved proposals by the SROs to amend their rules to increase the customer margin requirements for short positions in equity and index options.<sup>1</sup> The proposals, which were approved for a six-month period, provided for margin requirements for broad-based index options of 100% of the option premium plus 15% of the underlying aggregate index value, less any out-of-the-money amount, with a minimum requirement of the option premium plus 10% of the underlying aggregate index value. The proposals provided for margin requirements for equity options and narrow-based index options of 100% of the option premium plus 20% of the underlying product value, less any out-of-the-money amount, with a minimum requirement of the option premium plus 10% of the underlying product value.

The CBOE notes that analysis of underlying instrument percentage price changes indicates that both equity and index options currently are overmargined. The SROs propose to extend the current margin requirements until July 17, 1989, however, to permit implementation of a routine margin monitoring program expected to be instituted by the options SROs in the second quarter of 1989. The SROs believe that the proposed rule changes are consistent with section 6(b)(5) of the Act in that extending the current margin requirements until a routine margin monitoring program is implemented should assure both firms and investors reasonable financial protection even if market volatility increases during this period.

#### B. Self-Regulatory Organizations' Statement on Burden on Competition

The SROs do not believe that the proposed rule change will impose a burden on competition.

#### C. Self-Regulatory Organizations' Statement on Comments on the Proposed Rule Change Received from Members, Participants, or Others

Comments were neither solicited nor received; however, the CBOE stated that discussions with staff of numerous member organizations reflected support for the continuation of current margin levels.

<sup>1</sup> Securities Exchange Act Release No. 25701, 53 FR 20706.

### III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

The SROs have requested accelerated effectiveness of the proposals pursuant to section 19(b)(2) of the Act to permit the uninterrupted effectiveness of the current margin levels. The Commission finds good cause for approving the proposed rule changes prior to the thirtieth day after the date of publication of the proposals in the **Federal Register**. The SROs' proposals extend current margin requirements that were noticed for the full thirty-day period and were approved by the Commission in Securities Exchange Act Release 25701 (May 17, 1988), 53 FR 20706. In light of the absence of any comments on the SROs' original proposal, the Commission believes that a good cause finding is warranted. In addition, the proposals merely extend the margin levels that have been in place for nine months, and prevent the margins from reverting back to levels that may be inconsistent with the routine margin monitoring program that is being developed.

The Commission finds that the proposed rule changes are consistent with the requirements of the Act and the rules and regulations thereunder applicable to a national securities exchange, and, in particular, the requirements of section 6(b)(5),<sup>2</sup> which provides, in pertinent part, that the rules of the exchanges must be designed to protect investors and the public interest. Extending the current margin requirements until a routine margin monitoring program is implemented should assure both firms and investors reasonable financial protection even if market volatility increases during this period. Moreover, the SROs have provided data to indicate that the current margin levels are adequate for prudential purposes.

Interested persons are invited to submit written data, views, and arguments concerning the foregoing. Persons making written submissions should file six copies thereof with the Secretary, Securities and Exchange Commission, 450 Fifth Street NW., Washington, DC 20549. Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5

U.S.C. 552, will be available for inspection and copying in the Commission's Public Reference Section, 450 Fifth Street NW., Washington, DC. Copies of such filing also will be available for inspection and copying at the principal office of the above-referenced self-regulatory organization. All submissions should refer to the file numbers in the caption above and should be submitted by May 2, 1989.

*It is therefore ordered*, pursuant to section 19(b)(2) of the Act,<sup>3</sup> that the proposed rule changes are approved for a period ending on July 17, 1989.

For the Commission, by the Division of Market Regulation, pursuant to delegated authority.<sup>4</sup>

Dated: April 4, 1989.

Jonathan G. Katz,

Secretary.

[FR Doc. 89-8501 Filed 4-10-89; 8:45 am]

BILLING CODE 8010-01-M

[Rel. No. 34-26694; File No. SR-NASD-87-10]

### Self-Regulatory Organizations; National Association of Securities Dealers, Inc.; Order Approving Proposed Rule Change

The National Association of Securities Dealers, Inc. ("NASD") submitted on February 6, 1987, copies of a proposed rule change pursuant to section 19(b) of the Securities Exchange Act of 1934 ("Act")<sup>1</sup> and Rule 19b-4<sup>2</sup> thereunder to amend section 59 of the NASD Uniform Practice Code, which governs Close-Out Procedures. The amendment requires buy-ins for cash or guaranteed delivery for NASDAQ securities, where the buyer is a customer other than another NASD member, upon the failure of a clearing corporation to effect delivery pursuant to a buy-in notice.

Notice of the proposed rule change, together with the terms of substance of the proposed rule change, was provided by the issuance of a Commission release (Securities Exchange Act Release No. 24297, April 3, 1987) and by publication in the **Federal Register** (52FR 11792, April 10, 1987).

The Division received three comment letters,<sup>3</sup> and the NASD has submitted

two responsive letters.<sup>4</sup> The letter from the National Securities Clearing Corporation ("NSCC") did not address the regulatory necessity of the proposed rule change, but rather offered suggestions on how the rule could be made more compatible with the existing national clearance and settlement system. First, the letter expresses NSCC's concern that the proposed rule could take transactions out of a clearing environment, thus adversely affecting the capital protections afforded by clearing corporations' daily marking procedures. Second, NSCC suggests that clearing members could be required to initiate a second buy-in through the clearing corporation before removing a transaction from the clearing system.

In response to the NSCC letter, the NASD stated that it does not believe that the proposed rule will have a substantial impact on members' capital because transactions will not be removed from the clearing system until a buy-in for cash or guaranteed delivery is executed. Second, the NASD believes that it would be inappropriate to require a second attempt at obtaining delivery of securities for a customer through the clearing corporation when the initial buy-in has not resulted in delivery. Finally, the NASD believes that the number of occasions (less than 5%) on which clearing corporations fail to effect delivery is so insubstantial that the impact of the rule should be minimal.

The first comment letter from counsel for Gilder, Gagnon opposes adoption of the proposed rule change in any form. The letter, and the supplement thereto, transmitted studies prepared by professors at Pennsylvania State University ("Woolridge studies")<sup>5</sup> that examine short selling and security prices and buy-ins of short positions.

The Gilder, Gagnon letter and the studies suggest that the proposed rule would impair market efficiency by forcing the use of buy-ins for cash or guaranteed delivery, resulting in artificial increases in execution prices for the securities bought in. The NASD's response is that the proposed rule is narrow in scope and should improve market efficiency. First, the NASD

<sup>4</sup> Letter to Katherine England, Branch Chief, Over-the-Counter Regulation, SEC, from T. Grant Callery, Associate General Counsel, NASD, dated June 25, 1987; letter to Richard Ketchum, Director, Division of Market Regulation, SEC, from Frank J. Wilson, Executive Vice President, NASD, dated August 25, 1988.

<sup>5</sup> J. Randall Woolridge, *An Economic Analysis of Short Selling and Security Prices*, July 1986; and J. Randall Woolridge and Robert A. Wood, *Short Selling Rules and Security Prices: An Examination of Buy-ins of Short Positions*, working paper, June 1987.

<sup>2</sup> 15 U.S.C. 78f(b)(5) (1982).

<sup>3</sup> 15 U.S.C. 78s(b)(2) (1982).

<sup>4</sup> 17 CFR 200.30-3(a)(12) (1988).

<sup>1</sup> 15 U.S.C. section 78s(b)(1) (1982).

<sup>2</sup> 17 CFR 240.19b-4 (1988).

<sup>3</sup> Letters to Jonathan Katz, Secretary, SEC, from Michael J. Simon, Vice President and Associate General Counsel, National Securities Clearing Corporation, May 8, 1987; and from Saul S. Cohen, Rosenman & Colin, Counsel for Gilder Gagnon & Co., May 22, 1987, supplemented June 5, 1987, and December 5, 1988.

states, the rule applies only to securities of public customers and therefore will not impair the ability of member firms to conduct business in the interdealer market. Second, the proposed rule takes effect only upon the failure of a clearing corporation to deliver securities in response to a buy-in notice given to the clearing corporation. The NASD therefore believes that the rule will not force customers into a guaranteed delivery unless they have already affirmatively sought to obtain delivery of securities by initiating a clearing corporation buy-in.

The Woolridge study on buy-ins concludes that the findings and recommendations of the NASD-sponsored Pollack study of short sale regulation in the NASDAQ market<sup>6</sup> are inconsistent in that Pollack proposed the mandatory buy-in rule but his study does not indicate that such a rule is necessary. Woolridge finds that short position buy-ins could result in artificial short-term price increases due to: (1) Increases in demand not associated with changes in risk and expected return consideration or (2) abusive trading practices by the buying-in broker. The NASD's response questions the validity of Woolridge's findings insofar as the study compares prices of trades for guaranteed delivery with those with an uncertain future delivery date. The increased price for a contract for guaranteed delivery, according to the NASD, reflects the fact that securities currently available for regular way delivery command a different market price from those with an uncertain delivery date. In the NASD's view, the increased price for a guaranteed delivery buy-in should not be considered a price aberration in the existing market but rather a totally different purchase contract.

The NASD also has filed a second letter. First, the letter stresses the customer protection aim of the rule. Because customers have imperfect information about the securities delivery process, the NASD argues that most customers probably are unaware that their brokers may not have possession of their securities. The letter states that it was never contemplated that market participants would be able to engage in naked short selling, and that the proposed buy-in rule is one further step by the NASD to ensure compliance with existing contractual obligations by short sellers and provide needed discipline within the delivery system.

<sup>6</sup> I. Pollack, Short-Sale Regulation of NASDAQ Securities, July 1986. Among other recommendations, the study suggested that the NASD propose a mandatory buy-in rule.

The letter further points out that the proposed rule affects only those situations (estimated at less than 100 per day) in which neither the clearing corporation nor the broker to be bought in can produce the shares required for customer accounts. In these cases, the rule clarifies the obligation of the receiving broker; by reinforcing that obligation, it can be expected to increase rather than reduce the pricing efficiency of the market.

The second letter from counsel for Gilder, Gagnon reaffirms his prior position and, in addition to addressing certain specific points in the second NASD letter, argues that the NASD has presented no evidence that the markets have changed in the two years since the Pollack study and that, therefore, the mandatory buy-in rule remains unnecessary.

The Commission has reviewed carefully the concerns expressed in the three comment letters. The Commission recognizes the potential for increased risks and costs inherent in any regulation essentially aimed at naked short selling practices. In particular, the Commission has reviewed carefully the arguments raised by the Gilder, Gagnon comment letters and Woolridge studies that the proposed rule would unnecessarily increase the risks and costs associated with short selling and would invite abusive buy-ins.

The Commission believes, however, that public customers' reasonable expectation that their securities have been delivered and are held by their broker-dealers should be met. Without such assurance, public customers may respond by removing their securities from street name and, in some cases, forcing settlement on an ex-clearing basis. Moreover, naked short selling potentially can present substantial manipulative concerns. While naked short sellers are margined by NSCC, they enjoy substantially greater leverage than if they were required to borrow and deliver their securities. The ability of naked short sellers to employ this leverage to effect "bear raids" would appear to provide support for the NASD's decision to impose additional discipline on naked short selling.

Accordingly, the Commission believes that the NASD is taking a reasonable approach to deal with the problems that the Pollack study revealed. While fails-to-deliver resulting from short sales may be relatively infrequent, we cannot say that the proposed mandatory buy-in rule for public customers is an unwarranted restriction on short selling. Even recognizing that some brokers or their customers could abuse the rule by

buying-in at an inopportune time, requiring the defaulting party to pay more for securities than it might otherwise have to, the Commission understands that the NASD, pursuant to its self-regulatory responsibilities under Section 15A of the Act, has surveillance procedures in place to detect such abuses. In addition, we are unable to conclude that the relatively few occasions on which this rule will be legitimately invoked will affect substantially the risks and costs associated with short selling.

Further, we note that buy-ins for cash or guaranteed delivery can occur under the current regime at the buying-in broker's discretion, and that the proposed rule change would make buy-ins mandatory only for public customer accounts, and only after a clearing corporation's failure to deliver. The Commission therefore believes the rule to be narrowly drawn to achieve its goal.

For the reasons discussed above, the Commission finds that the proposed rule change is consistent with the requirements of the Act and the rules and regulations thereunder applicable to the NASD, and, in particular the requirement in section 15A(b)(6) of the Act that the NASD's rules promote just and equitable principles of trade, and the requirement of section 15A(b)(9) that the NASD not promulgate rules that impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Act.

*It is therefore ordered*, pursuant to section 19(b)(2) of the Act, that the above-mentioned proposed rule change be, and hereby is, approved.

For the Commission, by the Division of Market Regulation pursuant to delegated authority, 17 CFR 200.30-3(a)(12).

Dated: April 4, 1989.

Jonathan G. Katz,  
Secretary.

[FR Doc. 89-8502 Filed 4-10-89; 8:45 am]

BILLING CODE 8010-01-M

[Rel. No. IC-16902; File No. 812-7208]

**The Minnesota Mutual Life Insurance Co.; et. al.**

April 4, 1989.

**AGENCY:** Securities and Exchange Commission.

**ACTION:** Notice of Application for an order under the Investment Company Act of 1940 (the "Act").

*Applicants:* The Minnesota Mutual Life Insurance Company ("Minnesota Mutual"), Minnesota Mutual Variable

Life Account (the "Account"), and MIMLIC Sales Corporation ("MIMLIC Sales").

*Relevant 1940 Act Sections:* Order requested under section 6(c) exempting Applicants from section 27(a)(3) of the Act and Rule 6e-2(b)(13)(ii) thereunder.

*Summary of Application:* Applicants seek an order to permit them to eliminate the 7% sales load presently imposed on unscheduled or "nonrepeating" premium payments under certain schedule premium variable life insurance contracts issued by the Account (the "Contracts"). The requested order would amend the portion of an existing order [Investment Company Act Rel. No. 15523 (Jan. 7, 1987)] exempting Applicants from section 27(a)(3) of the Act and Rule 6e-2(b)(13)(ii) thereunder.

*Filing Date:* The Application was filed on December 29, 1988.

*Hearing or Notification of Hearing:* If no hearing is ordered, the application will be granted. Any interested person may request a hearing on this application, or ask to be notified if a hearing is ordered. Any request must be received by the SEC by 5:30 p.m. on April 26, 1989. Request a hearing in writing, giving the nature of your interest, the reason for the request, and the issues you contest. Serve the Applicants with the request either personally or by mail, and also send it to the Secretary of the SEC, along with proof of service by affidavit, or for lawyers, by certificate. Request notification to the date of a hearing by writing to the Secretary of the SEC.

**ADDRESSES:** Secretary, SEC, 450 5th Street NW., Washington, DC 20549. Applicants, 400 North Robert Street, St. Paul, Minnesota 55101.

**FOR FURTHER INFORMATION CONTACT:** Joyce M. Pickholz, Staff Attorney, (202) 272-3046 or Clifford E. Kirsch, Special Counsel, (202) 272-2061 (Division of Investment Management, Office of Insurance Products).

**SUPPLEMENTARY INFORMATION:** The following is a summary of the application; the complete application is available for a fee from either the SEC's Public Reference Branch in person, or the SEC's commercial copier, (800) 231-3282 (in Maryland (301) 258-4300).

#### Applicant's Representations

1. Minnesota Mutual is a mutual life insurance company organized under the laws of Minnesota in 1880, having total assets at December 31, 1987, in excess of \$4 billion. The Account is a separate account of Minnesota Mutual established on October 21, 1985, to facilitate issuance of certain scheduled

premium variable life insurance contracts (the "Contracts" or "Policies"). On February 10, 1986, the Account was registered under the Act as a unit investment trust [File No. 811-4585]. MIMLIC Sales, an indirect wholly-owned subsidiary of Minnesota Mutual, is the principal underwriter for the Account. The Contracts are sold by life insurance agents of Minnesota Mutual who are associated persons of either MIMLIC Sales or other broker-dealers who have entered into selling agreements with MIMLIC Sales. MIMLIC Sales is registered as a broker-dealer under the Securities Exchange Act of 1934 and is a member of the National Association of Securities Dealers, Inc.

2. The Contracts are scheduled premium variable life insurance contracts similar to a conventional life insurance product known as "adjustable life." Like other scheduled premium policies, absent a policy loan the Contracts do not lapse, provided scheduled premiums are paid when due or within the grace period. The Contracts, like conventional adjustable life insurance, permit an owner to select a plan of insurance based on his or her insurance needs and the amount of premium the owner wishes to pay. Based on the owner's selection of any two of three components of a Contract—face amount, premium and plan of insurance—Minnesota Mutual will then calculate the third. In addition, the Contracts may be adapted to the owner's changing needs and objectives subsequent to issue. The owner may change or "adjust" the face amount and premium level, and thus the plan of insurance, subject to certain limitations, so long as the Contract remains in force.

3. A 7 percent sales load is deducted from each scheduled premium and a "first year sales load" not to exceed 23 percent may also be deducted. The first year sales load applies only to "base premiums" (premiums minus any parts of the premiums that provide incidental insurance benefits by rider) scheduled to be paid in the twelve month periods following (i) the Policy date, (ii) any Policy adjustment involving an increase in base premium or (iii) any Policy adjustment occurring during a period when a first year sales load is being assessed. It also applies only to that portion of an annual base premium necessary for an original issue whole life plan of insurance. For plans of insurance greater than whole life, the amount of the base premium in excess of the original issue whole life base premium is subject only to the 7 percent base sales load. In computing the first year sales load following a policy

adjustment involving an increase in base premium, the charge is applied only to the amount of the increase in base premium. However, if an adjustment occurs during a period when a first year sales load is being taken, the uncollected portion of the sales load—determined on the basis of the lesser of the base premium in effect prior to, or following, the adjustment—is also assessed during the twelve month period following the adjustment.

4. All of the sales load charges are designed to average not more than 9 percent of the base premiums less any charge for substandard risks over the lesser of (i) the life expectancy of the insured at Policy issue or adjustment or (ii) fifteen years from Policy issue or adjustment. Compliance with the 9 percent ceiling will be achieved by reducing the amount of the first year sales load, if necessary.

5. Under the current terms of the Contracts, nonrepeating premiums are subject only to the base sales load of 7%. If the relief requested in this application is granted, then no sales load would be deducted from nonrepeating premiums. The order requested would modify only the relief from the provisions of section 27(a)(3) of the Act and Rule 6e-2(b)(13)(ii) thereunder granted by the prior order. The modification would expand the prior relief only to the extent necessary to permit Applicants to eliminate the 7% sales load on unscheduled or "nonrepeating" premium payments made under the Policies. The prior application, as finally amended, November 7, 1986, is incorporated herein by reference.

6. The Applicants state that when the sales load on nonrepeating premiums is eliminated, a technical violation of section 27(a)(3) of the Act and Rule 6e-2(b)(13)(ii) thereunder might be deemed to occur anytime a nonrepeating premium is paid, rather than only if the payment is made during the first policy year. The next scheduled payment after a non-repeating payment made other than during the first year after issuance or adjustment of the Contract would have a higher load deducted (7%) than that deducted from the prior (nonrepeating) payment (0%). The Applicants state that this example illustrates the only new circumstance where stair-step relief not granted by the prior order is needed. Otherwise, the same relief is being requested as in the prior application, but on the basis of nonrepeating payments that are subject to no-load rather than to a 7% load.

7. Minnesota Mutual has decided to eliminate sales loads on nonrepeating premiums for the Contracts and certain



of its other life insurance contracts. Contract owner decisions to make nonrepeating payments are not ones typically resulting from extensive efforts of salesmen, as are initial purchase or policy adjustment decisions. Elimination of sales load on nonrepeating premiums will make them much more attractive to Contract owners and should result in an increase in such payments. Increased payments under the Contracts should benefit both Minnesota Mutual and its Contract owners by permitting greater economies of scale.

8. Section 27(a)(3) of the Act proscribes any change in the proportionate amount of sales load deducted from any payment under a periodic payment plan certificate except after the first twelve monthly payments or their equivalent. Paragraph (b)(13) (ii) of Rule 6e-2 grants an exemption from section 27(a)(3), provided the proportionate amount of sales load deducted from any payment does not exceed the proportionate amount deducted from any prior payment (with an exception not here relevant).

9. Under the Policies, the more nonrepeating payments that a Policy owner made at no-load, the less would be his or her overall sales load rate. Regardless of when made, nonrepeating payments at no-load reduce the effective sales load percentage taken under the policy up to that time. Because a lesser percentage of Policy owner payments would be "lost" to sales load at the time of a default or surrender if any no-load payments had been made, those payments would prevent a defaulting investor from "losing" too much of his money to sales load, a result consistent with the purposes of section 27 of the Act.

10. The application states that for the reasons and upon the facts set forth above, the exemptions requested are appropriate in the public interest and consistent with the protection of investors and the purposes fairly intended by the policy and provisions of the Act.

For the Commission, by the Division of Investment Management, under delegated authority

**Jonathan G. Katz,**

*Secretary.*

[FR Doc. 89-8503 Filed 4-10-89; 8:45 am]

BILLING CODE 8010-01-M

[Rel. No. IC-16904; 812-7211]

### Shearson Lehman Hutton Unit Trusts; Notice of Application

April 6, 1989.

**AGENCY:** Securities and Exchange Commission ("Commission").

**ACTION:** Notice of Application for an Order under the Investment Company Act of 1940 (the "1940 Act").

*Applicants:* Shearson Lehman Hutton Unit Trusts ("Shearson Unit Trusts") on behalf of itself and each of its future series (each a "Trust" and collectively, the "Trusts"), Shearson Lehman Hutton Inc. (the "Sponsor"), and any present or future fixed income or equity mutual funds (other than money market or no-load funds) which are part of the group of mutual funds which have a common investment adviser, principal underwriter or depositor, or whose investment advisers, principal underwriters or depositors are under common control (as "control" is defined in section 2(a)(9) of the 1940 Act) and that hold themselves out to investors as related funds for purposes of investment and investor services ("the "Funds") ("the Shearson Unit Trusts, the Trusts, the Sponsor and the Funds collectively, the "Applicants").

*Relevant 1940 Act Sections:* Order requested pursuant to: (i) section 6(c) granting exemptions from sections 12(d)(1), 14(a) and 22(d); and (ii) section 17(d) and Rule 17d-1 thereunder, approving certain affiliated transactions.

*Summary of Application:* Applicants seek an order pursuant to: (i) section 6(c) of the Investment Company Act of 1940 (the "Act") exempting them from section 12(d)(1) to permit the Trusts to invest in portfolios consisting of zero-coupon obligations and Fund shares, from section 14(a) to exempt the Trusts from the requirement that an investment company must have a net worth of \$100,000 at the time of a public offering of its securities, and from section 22(d) to permit the waiver of deferred sales loads under certain circumstances; and (ii) section 17(d) of the Act and Rule 17d-1 thereunder, approving certain affiliated transactions.

*Filing Dates:* The application was filed on December 30, 1988, and amended on March 9, March 17, March 23, and April 5, 1989. Applicants have agreed to file an amendment to the application during the notice period to provide an additional exhibit. The exhibit will set forth a cost/benefit analysis further supporting their request for relief from section 12(d)(1).

*Hearing or Notification of Hearing:* If no hearing is ordered, the application

will be granted. Any interested person may request a hearing on this application, or ask to be notified if a hearing is ordered. Any requests must be received by the Commission by 5:30 p.m., on April 26, 1989. Request a hearing in writing, giving the nature of your interest, the reason for the request, and the issues you contest. Serve the Applicants with the request, either personally or by mail, and also send it to the Secretary of the Commission, along with proof of service by affidavit or, for lawyers, by certificate. Request notification of the date of a hearing by writing to the Secretary of the SEC.

**ADDRESSES:** Secretary, Securities and Exchange Commission, 450 5th Street NW., Washington, DC 20549. Applicants, c/o Shearson Lehman Hutton Inc., Unit Trust Department, Two World Trade Center, 104th Floor, New York, New York 10048.

**FOR FURTHER INFORMATION CONTACT:** Regina Hamilton, Staff Attorney (202) 272-3024, or Brion R. Thompson, Branch Chief (202) 272-3016 (Office of Investment Company Regulation).

**SUPPLEMENTARY INFORMATION:** Following is a summary of the application; the complete application is available for a fee from either the SEC's Public Reference Branch in person or the SEC's commercial copier: (800) 231-3282 (in Maryland (301) 258-4300).

### Applicant's Representations

1. The Sponsor, a Delaware Corporation and indirect subsidiary of American Express Company, is engaged in the underwriting, securities and commodities, and brokerage business. It serves as sponsor/depositor of all series of the Shearson Lehman Hutton unit investment trusts and is principal underwriter of the trusts. Each of the Funds is, or is a series of, an open-end management investment company registered under the 1940 Act.

2. The Shearson Unit Trusts is a registered unit investment trust under the 1940 Act and will consist of one or more Trusts, each itself a separate series of the Shearson Unit Trusts. Each Trust will be a unit investment trust and will hold a separate portfolio of securities and file a separate registration statement under the Securities Act of 1933 ("1933 Act"). Each Trust will be created under its own trust indenture (the "Indenture"). The Indenture will incorporate by reference the master trust agreement (the "Agreement") to be entered into by the Sponsor, as depositor, Boston Safe Deposit and Trust Company, as indirect wholly-owned subsidiary of the Sponsor, as

trustee ("Trustee"), and Standard & Poors Corporation, as evaluator ("Evaluator"). The Agreement will contain standard terms and conditions common to all the Trusts (the Agreement and the Indenture together, the "Trust Agreement").

3. Pursuant to the Trust Agreement, the Sponsor will deposit with the Trustee securities consisting of: (a) Shares of one Fund per Trust; and (b) stripped Government securities, as defined in section 2(a) (16) of the 1940 Act, or certificates of interest or receipts for or other evidences of an ownership interest therein ("Zero-Coupon Obligations") (the Zero-Coupon Obligations together with the Fund shares, the "Securities"). The Sponsor will purchase such Zero-Coupon Obligations to be deposited in the Trust at the prevailing market price from unaffiliated third parties. Simultaneously with such deposit (the "Date of Deposit") the Trustee will deliver to the Sponsor registered certificates for units ("Units") representing the entire beneficial ownership of each Trust. Following the declaration of effectiveness of a Trust's registration statement under the 1933 Act and clearance under applicable state law, the Units will be offered for sale to the public by the Sponsor at the Public offering price described in the applicable prospectus. Each Trust will consist of the Securities, accrued and undistributed interest and dividends, undistributed capital gains, if any, and cash.

4. The Sponsor may deposit additional Securities, which may result in a potential corresponding increase in the number of Units outstanding. The Sponsor anticipates that any additional Securities deposited in a Trust subsequent to the initial Date of Deposit in connection with the sale of the additional Units will maintain as far as practicable the original percentage relationship between the principal amounts of Zero-Coupon Obligations and Fund shares in the Portfolio. The Securities will not be pledged or in any other way subjected to any debt by a Trust after the Securities are deposited in the Trust.

5. In acquiring the Securities for each Trust, the following factors are considered: (a) The nature of the Trust; and (b) where appropriate given the nature and purposes of the Trust, (i) the quality of the Securities (based on the Sponsor's judgment as to the potential for dividends or growth, taking into account an appraisal relating to the maintenance and growth of earnings in light of the past performance of the

issuer); (ii) the yield and price of the securities of comparable quality and maturity; and (iii) the availability or the market of the Securities that meet the Trust's quality, yield and price criteria.

6. The purpose of the Trusts is to provide preservation of capital and the opportunity for capital appreciation. Each Trust will contain a sufficient amount of Zero-Coupon Obligations to ensure that, at the specified maturity date for such Trust, investors purchasing Units on the Deposit Date will receive back the approximate total amount of their original investment in such Trust, including the sales charge. Applicants state that, although it is possible that investors who purchase Units on a date other than the Deposit Date may be able to purchase Units at a price that would result in their receipt of an amount at maturity approximately equal to their purchase price, the only date when such result can be predicted with reasonable certainty is the Deposit Date. Zero-Coupon Obligations deposited in each Trust will be noncallable or callable at par. Thus, at the maturity of a Trust, investors who purchased units on the Deposit Date would receive back the amount of their original investment since the principal value of the maturing Zero-Coupon Obligations would approximately equal the original purchase price of Units.

7. The shares of the Funds will be sold at net asset value for deposit in any one Trust. The Funds will waive any otherwise applicable front-end or deferred sales loads with respect to all shares sold or deposited in any trust to avoid pyramiding of expenses. Furthermore, because Fund shares have their net asset values calculated daily and this value is readily available to the Sponsor, no evaluation fee will be charged with respect to determining the value of Fund shares that constitute part of a Trust's portfolio. An evaluation fee will be charged, however, with respect to that portion of the Trust's portfolio that consists of Zero-Coupon Obligations.

8. Investors may be provided a reinvestment vehicle for distributions made during the life of a Trust whereby a Unitholder may elect to invest such distributions directly in Fund shares underlying a Trust. Such reinvestment will also be permitted upon maturity of a Trust. In either case, the Fund shares will be registered in the Unitholder's name and will not become part of the Trust's assets. No sales loads will be imposed on such reinvestments.

9. Certain of the Funds have adopted compensation plans of distribution in accordance with Rule 12b-1 under the

1940 Act. Recognizing that the Sponsor will receive a sales charge in connection with the sale of Trust Units, the Sponsor will rebate to the Trustee the Rule 12b-1 fees it receives on Fund shares attributable to the Fund shares held by the Trusts. This Rule 12b-1 fee rebate will not be made in respect of Fund shares held by individuals for their own accounts. Through the rebate of the Rule 12b-1 fees to the Trustee, the Trust will not bear any Rule 12b-1 fees and the shareholders of the Funds will be in the same position as if no Rule 12b-1 fees had been assessed against Fund shares held by the Trust. The rebated 12b-1 fees will be distributed on a monthly basis by the Sponsor to the Trustee who will then allocate such amounts to the Unitholders' accounts for distribution to Unitholders.

10. The Sponsor intends to maintain a secondary market for Units of each Trust, although it is not legally obligated to do so. The existence of such a secondary market will reduce or eliminate the number of the Units tendered for redemption and, thus, alleviate the necessity to sell Securities to meet redemption obligations. In the event that the Sponsor does not maintain a secondary market, the underlying Fund shares will be sold first to meet Unit redemption obligations. To ensure that the benefit of the Zero-Coupon obligations is not impaired, the Agreement provides that the Sponsor will not instruct the Trustee to sell Zero-Coupon Obligations from any Trust's portfolio until the Fund shares held therein have been liquidated, unless the Sponsor is able to sell Zero-Coupon Obligations and still maintain at least the original proportional relationship to Unit value. The Indenture also provides that Zero-Coupon Obligations may not be sold to meet Trust expenses.

#### **Applicants' Legal Analysis**

1. Applicants assert that section 12(d)(1) of the 1940 Act is intended to prevent the duplication of fees and costs, undue concentration of control without a corresponding increase in commitment of capital, and other adverse consequences to investors incident to the pyramiding of investment companies. Applicants contend that their proposal is structured to eliminate such pyramiding of expenses and control problems and that the unit investment trust format is uniquely adaptable to avoiding such concerns. Applicants note that in the event that any Fund is sold with a front-end sales charge, shares will be sold at net asset value to each Trust and to the Unitholders in connection with

reinvestments during the life of the Trust and upon maturity. Moreover, the Funds propose to waive any applicable deferred sales load ("DSL") on all redemptions of Fund shares that have been invested in a Trust's portfolio, as well as on redemptions by Unitholders of their holdings of Fund shares attributable to their reinvestment of proceeds upon maturity of the Trust or reinvestment of Trust distributions made during the life of the Trust. Moreover, the evaluation fee for Fund shares held by a Trust will be waived. In addition, Applicants have agreed as a condition that the Sponsor will rebate to each Trust the 12b-1 fees that otherwise would be imposed on Fund shares while such shares are held by a Trust. Finally, Applicants point out that because a unit investment trust has an unmanaged portfolio, there will be no duplicative advisory fees charged as there would be in the case where a managed mutual fund purchased shares of other managed mutual funds. Applicants assert that the costs and expenses of the administration and operation of the Trusts and the Funds will be reduced by the proposed arrangement.

2. Applicants maintain that their proposal addresses potentially abusive control problems resulting from concentration of voting power in a fund holding company or from the threat of large-scale redemptions. The voting of shares of the Fund which are held by a Trust will be performed by the Trustee. The Agreement governing the Trusts will provide, and Applicants agree as a condition to securing the relief requested, that the Trustee must vote all shares of a Fund held in a Trust in the same proportion as all other shares of the Fund, which are not held by a Trust, are voted. Applicants believe the threat of large-scale redemptions is alleviated by agreeing to conditions: (a) Permitting the Trustee to sell Fund shares only when necessary to meet redemption obligations or in the unlikely event that distributions from the underlying Fund shares are insufficient to meet the Trustee's expenses; (b) limiting the amount of any one Fund's shares that may be deposited into a Trust; and (c) requiring Applicants to structure the Trusts' maturity dates at least 30 days apart from one another. In addition, neither the Trustee nor the Sponsor will have any discretionary authority to determine when to sell Fund shares nor will they have the ability to substitute shares of another Fund for those already deposited.

3. Applicants state that their proposal addresses potential section 17(d) and Rule 17d-1 concerns. There will be no

duplication of sales charges with respect to the Fund shares and Trust Units because Fund shares will be sold at net asset value. Moreover, there will be no overlapping of management or evaluation fees. Therefore, Applicants believe that neither the Funds nor any Trust will be disadvantaged by the arrangement and each stands to gain significant benefits from the proposed transaction. Accordingly, Applicants conclude that the proposed arrangement is consistent with the provisions, policies and purposes of the 1940 Act and is no less advantageous to any one of the Applicants.

4. Applicants believe that because each Trust will have an initial net worth in excess of \$100,000 invested in Securities prior to the date on which effectiveness is requested for the Trust under the 1933 Act, Applicants will comply fully with section 14(a) of the 1940 Act. However, the Applicants recognize that under the Trust's proposed operation, the Sponsor could be deemed to be reducing the net worth of each Trust below the requirement imposed by section 14(a), and thus, they request an exemption from section 14(a). To satisfy the objectives of section 14(a), Applicants have agreed that the creation and operation of each Trust will comply in all respects with the requirements of Rule 14a-3 under the 1940 Act, except that the Trust will not restrict its portfolio investments to "eligible trust securities."

5. Applicants believe that it would be fair and equitable and in the public interest and the interest of shareholders for the DSL, if otherwise applicable, to be waived. Consequently they have requested an exemption from section 22(d) of the 1940 Act to permit the waiver of any otherwise applicable DSL on: (a) redemptions by the Trusts of holdings of Fund shares; and (b) redemptions by Unitholders of their holdings of the Fund shares attributable to their reinvestment of: (i) Proceeds of the Zero-Coupon Obligations at maturity of the Trusts, and (ii) any Trust distributions made during the life of a Trust. Applicants note that imposition of the DSL on the above-described redemptions of Fund shares would be duplicative to investors in the Trusts and thus raise concerns under section 12(d)(1) of the 1940 Act regarding the pyramiding of expenses. The Funds will fully disclose the waiver provision in the applicable prospectuses. Applicants submit that the waiver of the DSL will not harm the Funds or their remaining shareholders or unfairly discriminate among shareholders or purchasers of Fund shares.

## Applicants' Conditions

Applicants agree to the following as conditions to the granting of the requested order:

(a) The Trustee will not redeem Fund shares except to the extent necessary to meet redemptions of Units by Unitholders, or to pay Trust expenses should distributions received on Fund shares prove insufficient to cover such expenses.

(b) The Rule 12b-1 fees received by the Sponsor in connection with the distribution of Fund shares to the Trust will be rebated to the Trustee.

(c) Applicants will comply with Rule 12b-1 as currently adopted and may be modified.

(d) Applicants agree to comply with Rule 22d-1 as adopted and may be modified.

(e) Applicants agree to comply with Rule 6c-10 as proposed, adopted, and may be modified.

(f) No one Series of the Trust will, at the time of any deposit of any Fund shares, hold as a result of that deposit, more than 10% of the then-outstanding shares of a Fund.

(g) All Trust Series will be structured so that their maturity dates will be at least thirty days apart from one another.

(h) Creation and operation of each Trust Series will comply in all respects with the requirements of Rule 14a-3, except that the Trust will not restrict its portfolio investments to "eligible trust securities."

(i) Shares of a Fund which are held by a Series of the Trust will be voted by the Trustee of the Trust, and the Trustee will vote all shares of a Fund held in a Trust Series in the same proportion as all other shares of that Fund not held by the Trust are voted.

For the Commission, by the Division of Investment Management, pursuant to delegated authority.

Jonathan G. Katz,

Secretary.

[FR Doc 89-8504 Filed 4-10-89; 8:45 am]

BILLING CODE 8010-01-M

## DEPARTMENT OF THE TREASURY

### Debt Management Advisory Committee; Meeting

Notice is hereby given, pursuant to section 10 of Pub. L. 92-463, that a meeting will be held at the U.S. Treasury Department in Washington, DC, on May 2 and May 3, 1989, of the following debt management advisory committee:

Public Securities Association U.S. Government and Federal Agencies Securities Committee.

The agenda for the Public Securities Association U.S. Government and Federal Agencies Securities Committee meeting provides for a working session on May 2 and the preparation of a written report to the Secretary of the Treasury on May 3, 1989.

Pursuant to the authority placed in Heads of Departments by section 10(d) of Pub. L. 92-463, and vested in me by Treasury Department Order 101-05, I hereby determine that this meeting is concerned with information exempt from disclosure under section 552b(c)(4) and (9)(A) of Title 5 of the United States Code, and that the public interest requires that such meetings be closed to the public.

My reasons for this determination are as follows. The Treasury Department requires frank and full advice from representatives of the financial community prior to making its final decision on major financing operations. Historically, this advice has been offered by debt management advisory committees established by the several major segments of the financial community, which committees have been utilized by the Department at meetings called by representatives of the Secretary. When so utilized, such a committee is recognized to be an advisory committee under Pub. L. 92-463. The advice provided consists of commercial and financial information given and received in confidence. As such debt management advisory committee activities concern matters which fall within the exemption covered by section 552b(c)(4) of Title 5 of the United States Code for matters which are "trade secrets and commercial or financial information obtained from a person and privileged or confidential."

Although the Treasury's final announcement of financing plans may not reflect the recommendations provided in reports of an advisory committee, premature disclosure of these reports would lead to significant financial speculation in the securities market. Thus, these meetings also fall within the exemption covered by section 552b(c)(9)(A) of Title 5 of the United States Code.

The Assistant Secretary (Domestic Finance) shall be responsible for maintaining records of debt management advisory committee meetings and for providing annual reports setting forth a summary of committee activities and such other matters as may be informative to the public consistent with the policy of

section 552b of Title 5 of the United States Code.

David W. Mullins, Jr.,

Assistant Secretary (Domestic Finance).

Date: April 4, 1989.

[FR Doc. 89-8475 Filed 4-10-89; 8:45 am]

BILLING CODE 4810-25-M

## Office of the Secretary

[Department Circular—Public Debt Series—No. 10-89]

### Treasury Notes of April 15, 1996, Series F-1996

April 6, 1989

#### 1. Invitation for Tenders

1.1. The Secretary of the Treasury, under the authority of Chapter 31 of Title 31, United States Code, invites tenders for approximately \$7,000,000,000 of United States securities, designated Treasury Notes of April 15, 1996, Series F-1996 (CUSIP No. 912827 XK 3), hereafter referred to as Notes. The Notes will be sold at auction, with bidding on the basis of yield. Payment will be required at the price equivalent of the yield of each accepted bid. The interest rate on the Notes and the price equivalent of each accepted bid will be determined in the manner described below. Additional amounts of the Notes may be issued to Federal Reserve Banks for their own account in exchange for maturing Treasury securities. Additional amounts of the Notes may also be issued at the average price to Federal Reserve Banks, as agents for foreign and international monetary authorities.

#### 2. Description of Securities

2.1. The Notes will be dated April 17, 1989, and will accrue interest from that date, payable on a semiannual basis on October 15, 1989, and each subsequent 6 months on April 15 and October 15 through the date that the principal becomes payable. They will mature April 15, 1996, and will not be subject to call for redemption prior to maturity. In the event any payment date is a Saturday, Sunday, or other nonbusiness day, the amount due will be payable (without additional interest) on the next business day.

2.2. The Notes are subject to all taxes imposed under the Internal Revenue Code of 1954. The Notes are exempt from all taxation now or hereafter imposed on the obligation or interest thereof by any State, any possession of the United States, or any local taxing authority, except as provided in 31 U.S.C. 3124.

2.3. The Notes will be acceptable to secure deposits of Federal public

monies. They will not be acceptable in payment of Federal taxes.

2.4. The Notes will be issued only in book-entry form in denominations of \$1,000, \$5,000, \$10,000, \$100,000, and \$1,000,000, and in multiples of those amounts. They will not be issued in registered definitive or in bearer form.

2.5. The Department of the Treasury's general regulations governing United States securities, i.e., Department of the Treasury Circular No. 300, current revision (31 CFR Part 306), as to the extent applicable to marketable securities issued in book-entry form, and the regulations governing book-entry Treasury Bonds, Notes, and Bills, as adopted and published as a final rule to govern securities held in the TREASURY DIRECT Book-Entry Securities System in 51 FR 18260, *et seq.* (May 16, 1986), apply to the Notes offered in this circular.

#### 3. Sale Procedures

3.1. Tenders will be received at Federal Reserve Banks and Branches and at the Bureau of the Public Debt, Washington, D.C. 20239-1500, prior to 1:00 p.m., Eastern Daylight Saving time, Wednesday, April 12, 1989. Noncompetitive tenders as defined below will be considered timely if postmarked no later than Tuesday, April 11, 1989, and received no later than Monday, April 17, 1989.

3.2. The par amount of Notes bid for must be stated on each tender. The minimum bid is \$1,000, and larger bids must be in multiples of that amount. Competitive tenders must also show the yield desired, expressed in terms of an annual yield with two decimals, e.g., 7.10%. Fractions may not be used. Noncompetitive tenders must show the term "noncompetitive" on the tender form in lieu of a specified yield.

3.3. A single bidder, as defined in Treasury's single bidder guidelines, shall not submit noncompetitive tenders totaling more than \$1,000,000. A noncompetitive bidder may not have entered into an agreement, nor make an agreement to purchase or sell or otherwise dispose of any noncompetitive awards of this issue prior to the deadline for receipt of tenders.

3.4. Commercial banks, which for this purpose are defined as banks accepting demand deposits, and primary dealers, which for this purpose are defined as dealers who make primary markets in Government securities and are on the list of reporting dealers published by the Federal Reserve Bank of New York, may submit tenders for accounts of customers if the names of the customers

and the amount for each customer are furnished. Others are permitted to submit tenders only for their own account.

3.5. Tenders for their own account will be received without deposit from commercial banks and other banking institutions; primary dealers, as defined above; Federally-insured savings and loan associations; States, and their political subdivisions or instrumentalities; public pension and retirement and other public funds; international organizations in which the United States holds membership; foreign central banks and foreign states; and Federal Reserve Banks. Tenders from all others must be accompanied by full payment for the amount of Notes applied for, or by a guarantee from a commercial bank or a primary dealer of 5 percent of the par amount applied for.

3.6. Immediately after the deadline for receipt of tenders, tenders will be opened, following by a public announcement of the amount and yield range of accepted bids. Subject to the reservations expressed in Section 4, noncompetitive tenders will be accepted in full, and then competitive tenders will be accepted, starting with those at the lowest yields, through successively higher yields to the extent required to attain the amount offered. Tenders at the highest accepted yield will be prorated if necessary. After the determination is made as to which tenders are accepted, an interest rate will be established, at a  $\frac{1}{8}$  of one percent increment, which results in an equivalent average accepted price close to 100.000 and a lowest accepted price above the original issue discount limit of 98.500. That stated rate of interest will be paid on all of the Notes. Based on such interest rate, the price on each competitive tender allotted will be determined and each successful competitive bidder will be required to pay the price equivalent to the yield bid. Those submitting noncompetitive tenders will pay the price equivalent to the weighted average yield of accepted competitive tenders. Price calculations will be carried to three decimal places on the basis of price per hundred, e.g., 99.923, and the determinations of the Secretary of the Treasury shall be final. If the amount of noncompetitive tenders

received would absorb all or most of the offering, competitive tenders will be accepted in an amount sufficient to provide a fair determination of the yield. Tenders received from Federal Reserve Banks will be accepted at the price equivalent to the weighted average yield of accepted competitive tenders.

3.7. Competitive bidders will be advised of the acceptance of their bids. Those submitting noncompetitive tenders will be notified only if the tender is not accepted in full, or when the price at the average yield is over par.

#### 4. Reservations

4.1. The Secretary of the Treasury expressly reserves the right to accept or reject any or all tenders in whole or in part, to allot more or less than the amount of Notes specified in Section 1, and to make different percentage allotments to various classes of applicants when the Secretary considers it in the public interest. The Secretary's action under this Section is final.

#### 5. Payment and Delivery

5.1. Settlement for the Notes allotted must be made at the Federal Reserve Bank or Branch or at the Bureau of the Public Debt, wherever the tender was submitted. Settlement on Notes allotted to institutional investors and to others whose tenders are accompanied by a guarantee as provided in Section 3.5. must be made or completed on or before Monday, April 17, 1989. Payment in full must accompany tenders submitted by all other investors. Payment must be in cash; in other funds immediately available to the Treasury; in Treasury bills, notes, or bonds maturing on or before the settlement date but which are not overdue as defined in the general regulations governing United States securities; or by check drawn to the order of the institution to which the tender was submitted, which must be received from institutional investors no later than Thursday, April 13, 1989. In addition, Treasury Tax and Loan Note Option Depositories may make payment for the Notes allotted for their own accounts and for accounts of customers by credit to their Treasury Tax and Loan Note Accounts on or before Monday, April 17, 1989. When payment has been

submitted with the tender and the purchase price of the Notes allotted is over par, settlement for the premium must be competed timely, as specified above. When payment has been submitted with the tender and the purchase price is under par, the discount will be remitted to the bidder.

5.2. In every case where full payment has not been completed on time, an amount of up to 5 percent of the par amount of Notes allotted shall, at the discretion of the Secretary of the Treasury, be forfeited to the United States.

5.3. Registered definitive securities tendered in payment for the Notes allotted and to be held in TREASURY DIRECT are not required to be assigned if the inscription on the registered definitive security is identical to the registration of the note being purchased. In any such case, the tender form used to place the Notes allotted in TREASURY DIRECT must be completed to show all the information required thereon, or the TREASURY DIRECT account number previously obtained.

#### 6. General Provisions

6.1. As fiscal agents of the United States, Federal Reserve Banks are authorized, as directed by the Secretary of the Treasury, to receive tenders, to make allotments, to issue such notices as may be necessary, to receive payment for, and to issue, maintain, service, and make payment on the Notes.

6.2. The Secretary of the Treasury may, at any time, supplement or amend provisions of this circular if such supplements or amendments do not adversely affect existing rights of holders of the Notes. Public announcement of such changes will be promptly provided.

6.3. The Notes issued under this circular shall be obligations of the United States, and, therefore, the faith of the United States Government is pledged to pay, in legal tender, principal and interest on the Notes.

**Gerald Murphy,**

*Fiscal Assistant Secretary.*

[FR Doc. 89-8653 Filed 4-7-89; 8:45 am]

BILLING CODE 4810-40-M

# Sunshine Act Meetings

Federal Register

Vol. 54, No. 68

Tuesday, April 11, 1989

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409) 5 U.S.C. 552b(e)(3).

## BARRY GOLDWATER SCHOLARSHIP AND EXCELLENCE IN EDUCATION FOUNDATION

**TIME AND DATE:** 2:00 p.m., Tuesday, May 16, 1989.

**PLACE:** Russell Senate Office Building, Washington, DC 20510.

**STATUS:** The meeting will be closed to the public.

### MATTERS TO BE CONSIDERED:

Report On Results Of Scholarship Review Panel

- Discussion and consideration of scholarship candidates;
- Selection of Goldwater Scholars.

### CONTACT PERSON FOR MORE

**INFORMATION:** Gerald J. Smith, Executive Secretary, Telephone: (202) 755-2312.

Gerald J. Smith,

*Executive Secretary.*

[FR Doc. 89-8599 Filed 4-7-89; 2:45 pm]

**BILLING CODE 4738-91-M**

## EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

**"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT:** 54 FR 13453, Monday, April 3, 1989.

**PREVIOUSLY ANNOUNCED TIME AND DATE OF MEETING:** 2:00 P.M. (Eastern Time) Monday, April, 10, 1989.

### CHANGE IN THE MEETING:

#### *Closed Session*

Agency Adjudication and Determination on Federal Agency Discrimination Complaint Appeals has been taken off the agenda.

### CONTACT PERSON FOR MORE

**INFORMATION:** Frances M. Hart, Executive Officer, Executive Secretariat, (202) 634-6748.

Date: April 6, 1989.

Frances M. Hart,

*Executive officer, Executive Secretariat.*

This Notice issued April 6, 1989.

[FR Doc. 89-8582 Filed 4-6-89; 4:37 pm]

**BILLING CODE 6750-06-M**

## FEDERAL ELECTION COMMISSION

Federal Register Number 89-8293.

### PREVIOUSLY ANNOUNCED DATES & TIMES:

*Tuesday, April 11, 1989, 10:00 A.M., Closed Session*

*Thursday, April 13, 1989, 10:00 A.M., Open Meeting*

By direction of the Federal Election Commission, the Closed Session scheduled for Tuesday, April 11, 1989, is cancelled.

By direction of the Federal Election, the Open Meeting scheduled for Thursday, April 13, 1989, is cancelled.

### PERSON TO CONTACT FOR INFORMATION:

Mr. Fred Eiland, Information Officer, Telephone: 202-376-3155.

Marjorie W. Emmons,

*Secretary of the Commission.*

[FR Doc. 89-8667 Filed 4-7-89; 3:42 pm]

**BILLING CODE 6715-01-M**

## NUCLEAR REGULATORY COMMISSION

**DATE:** Weeks of April 10, 17, 24, and May 1, 1989.

**PLACE:** Commissioners' Conference Room, 11555 Rockville Pike, Rockville, Maryland.

**STATUS:** Open and Closed.

### MATTERS TO BE CONSIDERED:

#### Week of April 10

*Thursday, April 13*

9:30 a.m.—Briefing on Status of Implementation of Severe Accident Master Integration Plan (Public Meeting)

2:00 p.m.—Briefing on Implementation of Safety Goal Policy Statement (Public Meeting)

3:30 p.m.—Affirmation/Discussion and Vote (Public Meeting)

- Effectiveness Review of Final Initial Decision

#### Week of April 17—Tentative

*Monday, April 17*

10:00 a.m.—Discussion of Shoreham Full Power Operating License (Public Meeting)

2:00 p.m.—Discussion/Possible Vote on Peach Bottom Restart (Public Meeting)

*Thursday, April 20*

2:00 p.m.—Briefing on Status of TMI-2 Cleanup Activities (Public Meeting)

3:30 p.m.—Affirmation/Discussion and Vote (Public Meeting) (if needed)

#### Week of April 24—Tentative

*Tuesday, April 25*

10:00 a.m.—Briefing on the Status of Generic Issues (Public Meeting)

*Thursday, April 27*

10:00 a.m.—Periodic Briefing by Advisory Committee on Nuclear Waste (ACNW) (Public Meeting)

3:30 p.m.—Affirmation/Discussion and Vote (Public Meeting) (if needed)

#### Week of May 1—Tentative

*Tuesday, May 2*

10:00 a.m.—Briefing on Severe Accident Research Plan (Public Meeting)

2:00 p.m.—Briefing on Results of Maintenance Team Inspections (Public Meeting)

*Wednesday, May 3*

10:00 a.m.—Briefing on the Status of NUREG-1150 (Public Meeting)

2:00 p.m.—Periodic Briefing by Advisory Committee on Reactor Safeguards (ACRS) (Public Meeting)

3:30 p.m.—Affirmation/Discussion and Vote (Public Meeting) (if needed)

**ADDITIONAL INFORMATION:** By a vote of 5-0 on April 6, 1989, the Commission determined pursuant to 5 U.S.C. 552b(e) and § 9.107(a) of the Commission's rules that Commission business required that "Briefing on Rancho Seco" (Public Meeting) scheduled for April 7, 1989, be held on less than one week's notice to the public.

Affirmation of "Rulemaking on Early Site Permits, Design Certifications, and Combined Licenses" (Public Meeting) rescheduled for April 6, 1989, to April 7, 1989.

**Note.**—Affirmation sessions are initially scheduled and announced to the public on a time-reserved basis. Supplementary notice is provided in accordance with the Sunshine Act as specific items are identified and added to the meeting agenda. If there is no specific subject listed for affirmation, this means that no item has as yet been identified as requiring any Commission vote on this date.

To verify the status of meetings call (recording)—(301) 492-0292.

### CONTACT PERSON FOR MORE

**INFORMATION:** William Hill (301) 492-1661.

E.C. Shelburne,

*Office of the Secretary*

April 6, 1989.

[FR Doc. 89-8649 Filed 4-7-89; 2:25 pm]

**BILLING CODE 7590-01-M**

## SECURITIES AND EXCHANGE COMMISSION

**"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT:** [54 FR 13976 April 6, 1989].

**STATUS:** Closed meeting.

**PLACE:** 450 Fifth Street NW.,  
Washington, DC.

**DATE PREVIOUSLY ANNOUNCED:** Monday,  
April 3, 1989

**CHANGES IN THE MEETING:** Additional  
meeting.

The following additional items will be  
considered at a closed meeting on  
Thursday, April 6, 1989, at 2:30 p.m.  
Litigation matter.

Settlement of injunctive action.  
Commissioner Cox, as duty officer,  
determined that Commission business  
required the above change.

At times changes in Commission  
priorities require alterations in the  
scheduling of meeting items. For further  
information and to ascertain what, if  
any, matters have been added, deleted

or postponed, please contact: Holly  
Smith at (202) 272-2091

**Jonathan G. Katz,**  
*Secretary*

April 4, 1989.

[FR Doc. 89-8611 Filed 4-7-89; 11:31 am]

**BILLING CODE 8010-01-M**

# Corrections

Federal Register

Vol. 54, No. 68

Tuesday, April 11, 1989

This section of the FEDERAL REGISTER contains editorial corrections of previously published Presidential, Rule, Proposed Rule, and Notice documents. These corrections are prepared by the Office of the Federal Register. Agency prepared corrections are issued as signed documents and appear in the appropriate document categories elsewhere in the issue.

## DEPARTMENT OF COMMERCE

### International Trade Administration

#### Antidumping or Countervailing Duty Order, Finding, or Suspended Investigation; Opportunity To Request Administrative Review

##### *Correction*

In notice document 89-7686 appearing on page 13211 in the issue of Friday, March 31, 1989, make the following correction:

On page 13211, in the second column, in the table, under "Period", the third entry should read "01/01/88-12/31/88".

BILLING CODE 1505-01-D

## NUCLEAR REGULATORY COMMISSION

[Docket No. 50-155]

### Consumers Power Co., Consideration of Issuance of Amendment to Facility Operating License and Opportunity for Hearing

##### *Correction*

In notice document 89-7440 beginning on page 12976 in the issue of Wednesday, March 29, 1989, make the following correction:

On page 12976, in the second column, in the last paragraph, in the first line, "April 2, 1989" should read "April 28, 1989".

BILLING CODE 1505-01-D

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 71

[Airspace Docket No. 89-AWA-2]

#### Proposed Alteration of VOR Federal Airways

##### *Correction*

In proposed rule document 89-4964 beginning on page 9061 in the issue of

Friday, March 3, 1989, make the following correction:

##### § 71.123 [Corrected]

On page 9062, in the third column, under V-126 [Amended], in the third line, "Watervill-42e" should read "Waterville".

BILLING CODE 1505-01-D

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Parts 71 and 75

[Airspace Docket No. 89-AWA-3]

#### Proposed Alteration of VOR Federal Airways and Jet Routes; MI

##### *Correction*

In proposed rule document 89-4965 beginning on page 9063 in the issue of Friday, March 3, 1989, make the following correction:

##### § 71.123 [Corrected]

On page 9064, in the first column, under V-221 [Amended], in the eighth line, "260" should read "261".

BILLING CODE 1505-01-D



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**Tuesday  
April 11, 1989**

**Environmental  
Protection Agency**

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**Part II**

**Environmental  
Protection Agency**

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**40 CFR Part 86**

**Standards for Emissions From Methanol-  
Fueled Motor Vehicles and Motor Vehicle  
Engines; Final Rule**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 86

[AMS-FRL 3426-4]

#### Standards for Emissions From Methanol-Fueled Motor Vehicles and Motor Vehicle Engines

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** Today's rule provides emission standards and test procedures for vehicles operating on methanol fuels. The evaporative and exhaust emission standards apply to all new motor vehicles: light-duty methanol vehicles (LDMVs), light-duty methanol trucks (LDMTs), heavy-duty methanol vehicles and engines (HDMVs, HDMEs), and methanol motorcycles. The regulations are effective beginning with the 1990 model year.

With few exceptions, exhaust standards identical to those applicable to current petroleum-fueled diesel engines are set for methanol-fueled diesel engines. Similarly, standards identical to those currently applicable to gasoline fueled vehicles are set for methanol-fueled Otto-cycle vehicles.

The carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate, and smoke standards are numerically identical to those for current vehicles. Particulate and smoke standards, which currently apply only to petroleum-fueled diesel engines and vehicles (hereafter usually collectively referred to as vehicles), are set for methanol-fueled diesel vehicles. Idle CO standards apply to all methanol-fueled light-duty trucks and heavy-duty engines (Otto-cycle and diesel). Crankcase emissions are prohibited from all methanol vehicles and motorcycles. The new exhaust emission standards for non-oxygenated and oxygenated hydrocarbons (*i.e.*, organics) are intended to control carbon emissions from methanol vehicles to a level which is equivalent on a total carbon basis to that allowed from petroleum-fueled vehicles under their respective hydrocarbon (HC) standards. Evaporative organic emission standards are set for methanol vehicles regardless of engine type and are intended to limit carbon emissions to levels allowable for current gasoline vehicles. Particulate and NO<sub>x</sub> emission averaging programs are established for every class of methanol vehicle where similar programs exist for current vehicles and are structured identically to those programs. No averaging is permitted across fuel types (*e.g.*, between

methanol- and petroleum-fueled vehicles).

This action is being taken to remove the possibility that the absence of emission standards could hinder the development of methanol as a transportation fuel. The standards for methanol vehicles will provide a comparable degree of human health and environmental protection to that afforded by those applicable to current vehicles.

It should be noted that this rulemaking was developed prior to the enactment of the "Alternative Motor Fuels Act of 1988" (Pub. L. 100-494, October 14, 1988), which directs EPA to take specific actions necessary to include methanol-fueled vehicles in the Corporate Average Fuel Economy (CAFE) program beginning in 1992. These actions include the establishment of fuel economy test procedures. Since this rulemaking was at such an advanced level of review at the time that this Act was passed, including the necessary additional action would have severely delayed its promulgation. Therefore, the required action is not included here, and will be completed in a separate EPA regulation in the near future. All subsequent discussions of fuel economy and the CAFE program represent EPA's position prior to the "Alternative Motor Fuels Act of 1988."

**DATES:** This final rule is effective on June 12, 1989.

**Note.**—Under section 307(b)(1) of the Clean Air Act (hereafter referred to as "the Act"), EPA hereby finds that these regulations are of national applicability. Accordingly, judicial review of this action is available only by the filing of a petition for review in the United States Court of Appeals for the District of Columbia Circuit within 60 days of publication. Under section 307(b)(2) of the Act, the requirements which are the subject of today's notice may not be challenged later in judicial proceedings brought by EPA to enforce these requirements.

**ADDRESS:** Material relevant to this final rule is contained in Public Docket No. A-84-05. The docket is located at the U.S. Environmental Protection Agency, Central Docket Section, South Conference Center, Waterside Mall, 401 M Street, SW., Washington, DC 20460. The docket may be inspected between 8 a.m. and 3 p.m. on weekdays. A reasonable fee may be charged by EPA for photocopying. In addition, single copies of the Summary and Analysis of Comments document, which provides a basis for this final rulemaking, may be obtained by request from the contact person below. This document contains the Agency's response to the public comments received in regard to the Notice of Proposed Rulemaking (NPRM)

and updates the technical analyses that were originally presented in the Regulatory Support Document (Docket Item III-A-3) published concurrently with the NPRM.

**FOR FURTHER INFORMATION CONTACT:** Mr. Charles Moulis, Emission Control Technology Division, U.S. Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, MI 48105, (313) 668-4229.

#### SUPPLEMENTARY INFORMATION:

##### I. Introduction

Since the early 1970's, the nation's need to reduce levels of air pollution and its dependence on imported petroleum has led to much research into alternative motor fuels. Methanol (CH<sub>3</sub>OH) has emerged from this process as the leading candidate to replace gasoline when supplies of petroleum begin to tighten.<sup>1</sup> Methanol, currently made from natural gas and in the longer term producible from coal and other feedstocks, is more economical to produce and use than any other currently known liquid alternative to petroleum-based fuel. Methanol is an excellent, high octane, motor fuel. It has, in fact, been the fuel of the Indianapolis 500 race since the 1970's, in part because of its performance advantages over gasoline. It is clean burning, with significant potential advantages over petroleum fuels in terms of reactive HC, NO<sub>x</sub>, CO, smoke, and particulate emissions. Moreover, prototype methanol vehicles have routinely demonstrated a 5 to 10 percent energy efficiency advantage over comparable gasoline-fueled engines, and equivalent efficiency to comparable diesel oil-fueled engines. Optimized vehicles have the potential for even more dramatic improvements. This increased efficiency would lead to reductions in vehicular CO<sub>2</sub> emissions. This is important given the impact of CO<sub>2</sub> on global warming (*i.e.*, the "greenhouse effect"). In order to assess the overall impact of methanol use on global warming, however, methanol production process technology and feedstock must also be taken into account, as well as effects on other greenhouse gases such as methane, nitrous oxide, CO and ozone. This issue is discussed in more detail in Section VI (Environmental Effects).

Significantly, the three largest U.S. automakers have all publicly supported methanol as the most desirable

<sup>1</sup> Fuel methanol, as discussed herein, which may contain percentages of hydrocarbon additives, is to be distinguished from methanol blends where a small amount of methanol (*e.g.*, 2-5 percent) is mixed with gasoline and sold as gasoline

candidate to replace petroleum, and test fleets of methanol vehicles have been operated in several locations around the country as well as internationally. These fleets involve vehicles produced by almost every major manufacturer in the world. The largest light-duty vehicle demonstrations have been in California, and have involved over 800 vehicles. Methanol transit bus programs exist in or are planned for San Francisco, Seattle, Los Angeles, Riverside, Jacksonville, New York City, Denver, and Phoenix, as well as Canada, Germany, New Zealand, and South Africa. Early programs have adequately demonstrated the viability of methanol vehicles and present the possibility that methanol vehicles could enter the marketplace in significant numbers in the relatively near future. Development of more advanced methanol vehicle technologies is now being pursued with the goal of optimizing vehicle driving performance, emissions, and efficiency. Additionally, vehicle technology which allows the use of methanol and gasoline in any combination is available and is undergoing testing. It has been suggested that such technology could help to ease a transition to methanol during a period when fuel methanol is not widely distributed.

Before methanol vehicles are sold in significant numbers, however, appropriate regulatory consideration must be given to the emissions from such vehicles. The current Federal Motor Vehicle Control Program (FMVCP) applies to gasoline-fueled and diesel vehicles and utilizes test procedures designed for petroleum fuels. However, section 202 of the Clean Air Act (CAA), 42 U.S.C. § 7521, authorizes EPA to control harmful emissions from all vehicles regardless of fuel type.

Methanol producers and vehicle manufacturers have been aware that certain emission standards and test procedures will apply to methanol vehicles, but have not known what the specific requirements would be. This uncertainty was a potential impediment to the development of methanol as a transportation fuel according to a report by the General Accounting Office<sup>2</sup> and, along with other issues, led to the formation of a cabinet level working group on alcohol fuels. (This group, headed by the Vice President, recently endorsed methanol usage as a cost effective long term air quality strategy.)

To eliminate this uncertainty, EPA initiated the development of suitable emission standards, test procedures, and

associated regulations for all methanol motor vehicles: light-duty vehicles, light-duty trucks, heavy-duty vehicles, and motorcycles. On April 10, 1984, the Agency published an Advance Notice of Proposed Rulemaking (ANPRM) in the *Federal Register* (49 FR 14244). This notice set forth a preliminary approach to including methanol vehicles under the mobile source regulatory umbrella. Comments were requested from the public in a number of key areas in response to EPA's suggested approach. The ANPRM was followed by an informal workshop on May 30, 1984, to provide an opportunity for an exchange of views regarding the subjects raised in the notice.

After fully considering oral comments presented at the public workshop and written comments submitted in response to the ANPRM, the Agency published a Notice of Proposed Rulemaking (NPRM) in the *Federal Register* on August 29, 1986 (51 FR 30984). This notice further developed EPA's standard setting approach for methanol vehicles. In general, EPA proposed that standards identical to those already applicable to gasoline-fueled and diesel vehicles be set for methanol vehicles, depending on the engine type from which the methanol engine was derived.<sup>3</sup> Exceptions to this general rule were made only in areas where the emissions of methanol vehicles were expected to require control regardless of the combustion cycle utilized. Thus evaporative, idle, and crankcase emission standards were proposed for all methanol vehicles even though they currently apply to only one of the currently regulated vehicle types.

The Agency found this overall approach appropriate for several reasons. First, the otherwise applicable emission control requirements of the Act do not distinguish between vehicles operating on different fuels, and the legislative history of the Act indicates that Congress generally contemplated common emission standards for vehicles of different fuel types. Second, EPA previously took this approach in setting standards for diesel vehicles based on standards applicable to gasoline-fueled vehicles (for example, see 50 FR 10606). Third, this approach would provide equal environmental protection from vehicles of different fuel types, since the emissions of common pollutants would be controlled to the same levels. Fourth,

<sup>3</sup> Currently, emission standards for gasoline-fueled vehicles apply to exhaust hydrocarbons (HC), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), evaporative HC, and crankcase emissions. The standards for vehicles using diesel engines apply to exhaust HC, CO, NO<sub>x</sub>, crankcase emissions, particulate, and smoke.

methanol vehicles are expected to be similar in type, size, and function to their petroleum counterparts, so it would be equitable to require them to comply with the similar standards.

A public hearing was held on October 30, 1986, in Ann Arbor, Michigan at which oral comments on the NPRM were entertained. Written comments responding to the proposal were also received from 24 public and private parties.

Finally in a related action, on January 29, 1988 EPA published the "Guidance on Estimating Motor Vehicle Emission Reduction From the Use of Alternative Fuels and Fuel Blends" (technical report No. EPA-AA-TSS-PA-87-4). This document detailed Agency policy on the use of alternative fuels (including methanol) as an ozone reduction strategy. In this guidance, EPA found that the use of methanol fuel was a viable strategy for reducing ozone levels.

The remaining sections of this preamble describe EPA's resolution of the issues associated with the rulemaking. Section II describes today's action and summarizes the new requirements. Section III reviews the comments received on the NPRM and the Agency's analysis of those comments. Subsequent sections summarize the technical feasibility, leadtime requirements, environmental effects, and economic effects associated with the methanol standards.

## II. Description of the Action

The following discussion describes each provision of the Final Rule. As already discussed, methanol-fueled vehicles will now be regulated along with petroleum fueled vehicles under the existing Federal Motor Vehicle Control Program (FMVCP). In this regard, it is important to note that because the design and function of methanol vehicles is very much like that of their petroleum counterparts, the methanol emission control requirements are comparable (in most cases identical) to those already in existence. This includes EPA's motor vehicle emission regulations governing certification, production line, and in-use requirements. Rather than presenting an exhaustive review of the entire FMVCP, this section contains a basic description of the methanol emission control requirements. The established regulations or protocols generally will be highlighted only where they differ for methanol vehicles. For additional information on the new or existing program requirements, the reader is referred to the accompanying

<sup>2</sup> The report entitled, "Removing Barriers to the Market Penetration of Methanol Fuels," is available for review in EPA Docket No. A-84-05.

regulations appearing at the end of today's notice or Title 40, Part 86 of the

Code of Federal Regulations, which this rulemaking hereby amends. Table 1

summarizes the numerical standards promulgated in today's action.

TABLE 1.— EMISSION STANDARDS FOR 1990 AND LATER MODEL YEAR METHANOL-FUELED VEHICLES AND ENGINES <sup>1</sup>

Vehicle class	Exhaust Standards <sup>2</sup>					Evaporative Organics <sup>3</sup> (g/test)
	Organics <sup>3</sup>	CO	NO <sub>x</sub>	Particulate	Idle CO (% conc)	
LDV <sup>4</sup> Otto-cycle.....	0.41	3.4	1.0	N/A <sup>5</sup>	N/A	2.
LDV <sup>4</sup> diesel.....	0.41	3.4	1.0	0.20	N/A	2.
LDT <sub>16</sub> Otto-cycle.....	0.80	10	1.2	N/A	0.50	2.
	(1.0)	(14)	(1.2)		(0.50)	(2.)
LDT <sub>1</sub> <sup>6</sup> diesel.....	0.80	10	1.2	0.26	0.50	2.
	(1.0)	(14)	(1.2)		(0.50)	(2.)
LDT <sub>2</sub> <sup>7</sup> Otto-cycle.....	0.80	10	1.7	N/A	0.50	2.
	(1.0)	(14)	(1.7)		(0.50)	(2.)
LDT <sub>2</sub> <sup>7</sup> diesel.....	0.80	10	1.7	0.26	0.50	2.
	(1.0)	(14)	(1.7)		(0.50)	(2.)
HDE <sup>8</sup> Otto-cycle.....	1.1	14.4	<sup>10</sup> 6.0	N/A	0.50	3.
HDE <sup>9</sup> Otto-cycle.....	1.9	37.1	6.0	N/A	0.50	4.
HDE <sup>8</sup> diesel.....	1.3	15.5	<sup>10</sup> 6.0	<sup>11</sup> 0.60	0.50	3.
HDE <sup>9</sup> diesel.....	1.3	15.5	6.0	0.60	0.50	4.
MC.....	5.0	12	N/A	N/A	N/A	N/A

<sup>1</sup> Standards in parentheses apply to vehicles sold in specified high-altitude counties. Crankcase emissions are prohibited for all classes of vehicle

<sup>2</sup> LDV and LDT standards are in g/mi, HDE standards are in g/BHP-hr, and MC standards are in g/km, unless otherwise noted.

<sup>3</sup> Organics standards are expressed in petroleum-fueled vehicle hydrocarbon equivalents, as determined on a carbon mass basis.

<sup>4</sup> Standards apply at all altitudes.

<sup>5</sup> Not applicable.

<sup>6</sup> LDTs up to and including 3,750 lbs loaded vehicle weight (LVW).

<sup>7</sup> LDTs 3,751 lbs or greater LVW

<sup>8</sup> HDEs up to and including 14,000 lbs gross vehicle weight rating (GVWR).

<sup>9</sup> HDEs 14,001 lbs or greater GVWR.

<sup>10</sup> Beginning in 1991 model year, standard becomes 5.0 g/BHP-hr for all HDEs.

<sup>11</sup> Beginning in 1991 model year, standard becomes .25 g/BHP-hr for all HDEs except urban bus engines, which are subject to a 0.10 g/BHP-hr standard. 1994, the standard becomes 0.10 g/BHP-hr for all HDEs.

**A. Effective Date of the Methanol Standards**

Today's notice promulgates the 1990 model year as the effective date for the various emission control requirements, representing a two-year delay from the proposed implementation date. EPA had expected to promulgate these standards with sufficient leadtime to permit their implementation by the 1988 model year, but the delay in this final action has necessitated a delay in the standards' effective date. EPA recognizes that the start of the 1990 model year is less than a year away. The Agency also believes that few methanol vehicles are likely to be produced in the 1990 model year, and that any that are will likely be for sale to states and municipalities seeking to improve their air quality. Under these unique circumstances, EPA finds it appropriate to make compliance with the standards for the 1990 model year optional. This approach will ensure that manufacturers have adequate leadtime to respond to the new regulations in an orderly manner, but at the same time provide states and localities with an opportunity to purchase methanol vehicles that comply with EPA standards in the 1990 model year. A more detailed discussion of the issues affecting the leadtime required to comply with today's action is provided in a subsequent discussion (see Section

**V. "Leadtime and the Effective Date of the Standards")**

**B. NO<sub>x</sub>, CO, Particulate, Smoke, and Crankcase Emission Standards**

The NO<sub>x</sub>, CO, particulate, smoke, and crankcase emission standards are promulgated as originally proposed, with the exception of the 1990 model year effective date as noted above. In codifying standards for methanol vehicles, it was helpful to classify existing standards according to whether they were applicable to gasoline-fueled vehicles or diesel vehicles, and to extend this classification scheme to include methanol vehicles. Thus, the section of the regulations covering diesel vehicle standards now includes the provision of a methanol test fuel as well as appropriate test modifications necessary to accommodate the properties of methanol vehicle emissions. Similarly, the regulatory sections covering gasoline-fueled vehicles are broadened such that gasoline vehicles (whose thermodynamic characteristics approximate the theoretical Otto-cycle) and Otto-cycle methanol vehicles are grouped together under sections setting forth the standards and test procedures

applicable generally to Otto-cycle vehicles.<sup>4</sup>

The NPRM relied on a nonsubstantively different organizational scheme to present the standards that are being finalized today. That document proposed generally applying the diesel vehicle standards to non-throttled methanol vehicles and the gasoline-fueled vehicle standards to throttled methanol vehicles.<sup>5</sup> The use of non-use of a throttle was found to be a good indicator of emissions and performance similarities between methanol vehicles and their petroleum-counterparts. The final rule, which classifies methanol vehicles as diesel or Otto-cycle vehicles, uses a different nomenclature to apply the same general principle. The change in approach is one of organizational convenience and simply lends clarity to the structure of the motor vehicle emission control regulations. The classification of a methanol vehicle as an Otto-cycle or diesel vehicle still depends on the use of non-use of a throttle in normal operation. The final rule also recognizes:

<sup>4</sup> No diesel motorcycle standards exist because no such vehicles are mass produced for sale. Therefore, the gasoline motorcycle standards apply to all methanol motorcycles.

<sup>5</sup> For purposes of this rule, a throttle is a device used to control an engine's power output by limiting the amount of air entering the combustion chamber

that in some future cases, this criterion may not be sufficient to adequately determine the classification of a vehicle. For example, a throttle may be used during only part of the operating cycle. In such cases, the Administrator may need to take into account other relevant factors, such as compression ratio, combustion characteristics, characteristics of the engine's operating thermodynamics, or intended in-use duty cycle. Therefore, unless otherwise specified, where the standards for petroleum vehicles differ by fuel type, the requirements for gasoline-fueled vehicles apply to methanol-fueled Otto-cycle vehicles, while those associated currently with diesel vehicles now apply to methanol-fueled diesel vehicles. More specifically, the exhaust CO standards for gasoline-fueled and diesel heavy-duty vehicles apply to methanol-fueled Otto-cycle and diesel vehicles, respectively. Similarly, the particulate and smoke standards, which apply to diesel vehicles only, are now applicable to methanol-fueled diesel vehicles.

As fully explained in a later section, there are two basic exceptions to the engine cycle-based applicability scheme as it relates to the pollutants discussed in this section. First, the idle CO standards, which apply to certain duty classes of gasoline vehicles, and set for *all* methanol vehicles of a corresponding class regardless of engine type. Second, the standards which currently prohibit crankcase emissions from all petroleum vehicles except non-naturally aspirated heavy-duty diesels, are now applicable to *all* methanol vehicles.

A waiver of the certification testing requirements for CO, particulate, or smoke emissions may be granted by the Administrator to any manufacturer demonstrating that, by virtue of a vehicle's design, the applicable standard would never be exceeded during the vehicle's useful service life. The waiver process is patterned after that associated with the CO standard for heavy-duty diesel vehicles. Manufacturers should be aware that receipt of a waiver of testing requirements in no way relieves the manufacturer of the responsibility to comply with emission standards in the certification process, during Selective Enforcement Audits, or in-use testing. Manufacturers should also be aware that receipt of a waiver in no way implies that EPA will not require emission testing for Selective Enforcement Audits or perform emission testing of in-use vehicles to determine compliance with the applicable standards.

Finally, manufacturers are allowed to determine compliance with the NO<sub>x</sub> and particulate standards by averaging emissions within certain vehicle categories. Averaging programs are available for LDMVs, LDMTs, and HDMEs (except bus engines) in the case of particulates, and for LDMTs and HDMEs (including bus engines) in the case of NO<sub>x</sub>. These are the same categories for which averaging is presently allowed for gasoline-fueled and diesel vehicles; restrictions relating to averaging between high and low altitude vehicles as well as 49-State and California vehicles will apply to methanol vehicles in the same fashion as for current vehicles. In a manner that is analogous to the separation made between the gasoline-fueled and diesel programs, averaging is prohibited between Otto-cycle and diesel methanol vehicles, and between methanol and petroleum-fueled vehicles.

#### C. Organic HC Emission Standards

Today's notice promulgates exhaust and evaporative HC standards for methanol vehicles which will generally limit the ozone producing potential of these vehicles to an amount no more than that of current vehicles. This is accomplished by limiting the amount of organic carbon emitted by methanol vehicles to that permitted from their petroleum counterparts. These carbon-limiting standards specifically account for non-oxygenated HC compounds as well as the oxygenated HC compounds of methanol and formaldehyde.<sup>6</sup> This approach results in standards for methanol vehicles that are equivalent to the existing HC standards for current vehicles and, for exhaust emissions, utilizes the same engine classification criteria (diesel or Otto-cycle) in distinguishing between methanol vehicle types as was used in applying CO, NO<sub>x</sub>, particulate and smoke standards. Evaporative emission standards, similar in format, are applicable regardless of vehicle type.

The mathematical expression of the organics standards requires the measured masses of non-oxygenated HC, methanol, and formaldehyde to be converted to carbon, summed, expressed as gasoline hydrocarbon (CH<sub>1.85</sub>) and compared to the numerical standard (e.g., from Table 1, 0.41 g/mi for LDMV exhaust emissions). The specific format of this expression is

<sup>6</sup> Technically, HC refers to compounds containing only hydrogen and carbon. By definition such compounds are non-oxygenated. In this rule, the term non-oxygenated HC is used, however, to distinguish the traditional hydrocarbon from the oxygenated components of methanol vehicle emissions.

provided in the regulations accompanying this notice.

#### D. Certification Test Fuel Specification

These regulations require that methanol-fueled vehicles be certified using a test fuel that is: 1) composed of 50 percent or more methanol by volume, and 2) is representative of commercially available fuels. This is similar to the approach currently used for specification of petroleum fuel for diesel vehicles. Representative in-use fuels cannot be determined, however, until the methanol fuel market develops. In the early years of methanol vehicle deployment, as the fuel market evolves, the manufacturer will be required to recommend the certification fuel and provide a justification for its belief that this fuel will be generally available and used in its vehicles. Final responsibility for specifying the test fuel will, however, remain with the Administrator. The Agency will continue to monitor developments in the fuel market and, in the longer run, act to specify representative fuels without requiring manufacturer participation in the process.

#### E. Test Procedures

Methanol-fueled vehicles are expected to be very similar to current vehicles in most respects. Therefore, the regulations being promulgated here generally apply the established certification and emission test protocols of 40 CFR Part 86 to methanol-fueled vehicles with only minor revisions as necessary to accommodate the unique functional aspects of methanol combustion technology. (For example, provision is made to ensure that the high water content of the products of methanol combustion does not interfere with accurate emissions sampling and analysis.)

The only area where major revisions were required involves the measurement of newly regulated pollutants. In order to ensure compliance with the organic standards being promulgated in this rulemaking, separate measurement of non-oxygenated HC, methanol, and formaldehyde is required. Although specific measurement procedures are provided in this rule (see the accompanying regulations for details), the Agency will allow alternative procedures provided that the manufacturer can demonstrate that they produce results equivalent to those obtainable from the procedures required here. These procedures are summarized in the following discussion.

The procedure for measuring non-oxygenated HC and methanol consists

of two steps. First, the methanol is collected by bubbling the exhaust or evaporative sample through water filled impingers. A gas chromatograph is then used to separate the methanol from the other constituents of the water/alcohol solution. The methanol is measured with a flame ionization detector (FID). Second, a combined measurement of the non-oxygenated HC and methanol in the sample is made using a heated FID calibrated on propane. The amount of non-oxygenated HC can then be determined by correcting the heated FID reading for methanol content. This requires an accurate determination of the device's response to pure methanol.

Formaldehyde measurements can be made using either of two similar procedures. The first involves bubbling the exhaust sample through impingers filled with 2,4-dinitrophenylhydrazine (DNPH) solution. The alternative procedure would replace the impingers with cartridges containing DNPH-impregnated silica gel. In either case, the products of the reaction between the aldehydes and the DNPH are separated using high pressure liquid chromatography. The amount of formaldehyde is then determined by an ultraviolet detector.

As an interim option, in order to give manufacturers flexibility in developing their methanol certification programs, EPA will allow manufacturers to use a simplified procedure for a five-year period from the date of initial effectiveness of these rules. This procedure involves a single measurement using a heated FID calibrated with methanol, with the result reported as  $CH_{1.85}$ . This would generally overmeasure HC, but undermeasure formaldehyde, with the net result being an organic measurement that would be somewhat higher than would have been obtained using the more detailed procedure. Vehicles certified using this procedure will also be liable for in-use compliance with the organics standards when this method is used.

As with other regulated pollutants, background measurements of each organic emission component are provided for in the test procedures.

#### *F. Testing and Certification of Flexible Fuel Vehicles*<sup>7</sup>

Under the regulations being promulgated in today's notice, vehicles that are designed to operate on gasoline, fuel methanol, or any mixture of these fuels must comply with the standards when tested on any fuel mixture which

falls within the design range. As a matter of testing convenience, EPA will only require the manufacturer to test the vehicle on the mixture that is expected to produce the highest emissions. However, EPA does retain the right to perform testing using any fuel mixture that falls within the design range. The worst-case test fuel for each flexible fuel vehicle (FFV) will be recommended by the manufacturer, and approved by the EPA Administrator, at the time of certification, and may be different for exhaust and evaporative emission testing. (When any fuel except gasoline is used, the test procedure applicable to methanol vehicles will be adopted for these vehicles.) The manufacturer will continue to be liable for ensuring that any FFV so certified will comply with the applicable standards in customer service if tested on any reasonably available gasoline or methanol fuel, or any mixture of the fuels. Since this rule takes no action with respect to the Corporate Average Fuel Economy and Gas Guzzler Tax program requirements, FFVs will be treated as gasoline-fueled vehicles for the purposes of fuel economy testing and labeling (*i.e.*, tested on pure gasoline).

#### **III. Public Participation**

A number of interested parties commented on EPA's August 29, 1986 NPRM. The comments include written submittals to the rulemaking docket and those presented at the October 31, 1986 public hearing, which was held in Ann Arbor, Michigan. The Agency has fully considered these comments in developing today's final rule.

This section describes the major issues of the rulemaking, as reflected by the public comments. The discussion of each issue opens with a brief review of what was proposed. After this, a summary of the significant comments and EPA's analysis of the issue is provided. The reader is referred to the appropriate chapter of the Summary and Analysis of Comments document for the complete technical details of EPA's analysis. That document is available in the rulemaking docket. (For information on access to the docket, see the "ADDRESSES" section above.)

##### *A. Scope of the Rulemaking*

*Summary of the Proposal.* While there has been an interest in alternative fuels for many years, the development of methanol as a transportation fuel is reaching the point where mass production of methanol vehicles is a real possibility within the next decade. As noted previously, before a significant number of these vehicles could be sold, they would be required to comply with

certain emission standards, as is the case for current petroleum-fueled vehicles. A primary purpose of expanding the scope of the Federal Motor Vehicle Control Program to cover methanol-fueled vehicles is to remove a potential impediment to the introduction of this technology by providing manufacturers with an understanding of the regulatory requirements which would be applicable to these vehicles. The Agency's overall regulatory approach in the proposed rule was to ensure that the standards applicable to methanol vehicles would be of comparable stringency to the standards applicable to petroleum fueled vehicles, and have environmental impacts no more adverse than current vehicles.

*Summary of the Comments.* The comments pertaining to the stated goals of the rulemaking either criticized the lack of standards for vehicles run on other alternative fuels, or addressed the stringency of the proposed emission control requirements for methanol vehicles. Regarding the breadth of the proposal, the State of New York commented that there is currently a substantial research effort aimed at developing a wide range of alcohol-based fuels from synthetic gas. It felt the rulemaking should be broadened to include all oxygenated fuels, avoiding the need to promulgate separate regulations in the future. CNG Services of Pittsburgh felt that emission standards should be promulgated for vehicles operated on natural gas. Brooklyn Union Gas felt EPA should put natural gas on a level playing field with methanol but did not actually suggest that standards be developed for natural gas vehicles.

A few manufacturers expressed the view that the rulemaking action should not inhibit progress through overly restrictive requirements. GM was the most outspoken in this regard, terming the proposed standards and test procedures "rigid and complex regulation." It also recommended an interim period of less stringent standards for methanol than for current vehicles to encourage further development. The Oxygenated Fuels Association and the Department of Energy (DOE) suggested interim standards to be revisited after several years. Several other commenters, such as Chevron, the National Automobile Dealers Association, and the Manufacturers of Emission Controls Association (MECA) were in basic agreement with EPA establishing methanol standards of comparable stringency, stating they would not be an impediment to methanol development.

<sup>7</sup> Flexible fuel vehicles are sometimes referred to as multi-fuel vehicles, dual-fuel vehicles, dual energy vehicles, or variable-fuel vehicles.

DOE and MECA both argued that while the proposed standards represent comparable stringency to gasoline vehicle regulations, more stringent standards could potentially be adopted in the future.

#### *EPA Response to Comments.*

Regarding the inclusion of other alternative fuels in the present rulemaking, EPA notes that a consensus has not yet emerged as to whether the lack of emission standards for energy sources other than methanol is a potential hindrance to their development as motor vehicle fuels. Methanol, on the other hand, has been identified by the motor vehicle manufacturers, the Federal government, many state and local governments and various environmental groups as a desirable and feasible future transport fuel. The lack of standards for methanol vehicles was identified by a Cabinet-level group as an impediment to methanol's introduction. Since a similar degree of broad based interest in other alternative transportation fuels has not been demonstrated, limiting the present rulemaking to methanol is appropriate. Moreover, if the Agency did wish to expand the scope of this rule, specific proposals would first have to be issued for comment. Thus it would not be possible for EPA to finalize standards for alternative fuels other than methanol in this rulemaking. However, the Agency may act in the future to address other fuels.

In fact, the Agency believes that, having included methanol-fueled vehicles within the framework of previously existing standards, the inclusion of vehicles run on other fuels can be expeditious, as discussed forthwith. The Agency intends to use the diesel and Otto-cycle classification to the greatest extent practicable in applying the current exhaust emission standard setting approach to engines using alternative fuels. Where single constituent pollutants such as CO are concerned identical standards regardless of fuel type would likely apply. Multi-constituent pollutants such as unburned or partially combusted fuel may require special consideration, as in the case of methanol vehicles. It is the Agency's intent to control evaporative emissions of volatile fuels without regard for engine cycle, most likely using similar criteria as are deemed appropriate for the regulation of unburned or partially combusted fuel in exhaust emissions. The Agency would also need to take into consideration any unique aspects of new fuels and their combustion properties in determining whether to control previously

unregulated pollutants (such as formaldehyde in the methanol vehicle case). Finally, test procedure modifications, as appropriate to ensure accurate measurement of all regulated pollutants, would need to be considered.

Such evenhanded treatment of different fuels would provide equitable environmental protection. It would also allow a more efficient operation of the free market in determining what engines are produced than would a policy of regulating differently the emissions resulting from the use of each new fuel. Furthermore, the use of a standard approach would expedite the process of including vehicles run on new fuels in the regulations, since it would not require returning to square one to derive appropriate standards. Thus, while the current rulemaking does not include any alternative fuel other than methanol within the purview of the emission control program, it does lay much of the groundwork necessary to include other fuels as it becomes apparent that they are potential market contenders. EPA will continue to monitor the progress of other alternative fuels, including their environmental benefits and likely market penetrations. Emission standards and test procedures for such fuels will be developed when warranted.

The preceding discussion regarding potential future fuels applies equally to potential future engine cycles. For example, a new Brayton cycle engine using petroleum fuel would be expected to meet the same single constituent pollutant standards as other engines, although special test procedures and additional emission standards might be necessary.

The Agency is in basic agreement with those commenters expressing concern that overly stringent regulation could hinder the development or sale of methanol vehicles, but disagrees that the proposed requirements would have this effect. As will be discussed in other sections of this document, the standards for methanol vehicles represent comparable stringency to those for current vehicles and should be achievable using similar technology. Such standards represent equitable technological treatment among the vehicle types. As will be discussed under the sections "Technical Feasibility" and "Economic Effects," the technical feasibility and cost of these standards are not issues; it is thus difficult to conclude that the rules as proposed would hinder the development of methanol vehicles, or that there is any basis to establish relaxed requirements

as suggested by GM.<sup>6</sup> Also, the rules as finalized provide the greatest degree of certainty for developers of methanol vehicles. In response to those commenters suggesting that standards of greater stringency and by extension, environmental benefit, may be feasible in the future, EPA notes that any standard not specifically set by statute may be reconsidered in the future if warranted.

In summary, given the underlying rationale for today's rule, there is no justification to change either its scope or its control strategy at present. Future actions to expand the regulations could of course occur and would be considered on their merits, taking account of cost, feasibility, environmental need, and any other relevant factors.

#### *B. Hydrocarbon Standards*

##### *1. Basis of the Ozone-Related Standards*

*Summary of the Proposal.* As already mentioned, EPA clearly stated its intention in the NPRM to implement standards for methanol vehicles that are of comparable stringency and environmental benefit to those applicable to current petroleum-fueled vehicles. Accordingly, with regard to reactive organic emissions, the Agency wanted to ensure that methanol vehicles would produce no more tropospheric ozone than current vehicles. Achieving this goal, however, is somewhat complicated due to differences in the chemical composition of exhaust and evaporative organic emissions between methanol and current vehicles. The photochemically reactive organic emissions from petroleum-fueled vehicles are composed primarily of non-oxygenated HC. Methanol vehicles emit not only non-oxygenated HC, but also substantial quantities of oxygenated HC compounds with varying photochemical reactivities. In the exhaust, these latter compounds are principally unburned methanol and formaldehyde. For evaporative emissions, methanol is the principal oxygenated HC compound. Thus, equivalent amounts of gasoline and methanol vehicle emissions can be expected to have different tendencies to produce ozone, and EPA's proposal had to account for this.

The Agency proposed separate exhaust and evaporative emission

<sup>6</sup> As is discussed in subsequent sections of this notice, certain test procedure requirements have been simplified for an interim period. These allowances do not, however, represent a change in the overall approach to the rule, but rather are intended to allow manufacturers the opportunity to gain familiarity with new equipment and test protocols.

standards that would limit the total amount of organic carbon emitted from methanol vehicles to the amount that is permitted from current vehicles complying with their applicable HC standards. This standard-setting approach was chosen by EPA because, based on limited photochemical modeling results, the ozone producing potential of methanol vehicles complying with the carbon-based standards was generally expected to be similar or somewhat less than that of current vehicles.<sup>9</sup> (Such a finding is not unexpected, given that the photochemical oxidation process leading to ozone production is carbon dependent.) Additionally, these standards appeared to be achievable using control technology similar to that already used on current vehicles, so they were not anticipated to be a hindrance to the development of methanol vehicles nor to result in increased compliance costs as compared to current vehicles. This approach also had the appeal of extending the basis of the HC standards for existing vehicles to methanol vehicles in a manner apparently consistent with the basic philosophy embodied in the Clean Air Act, which focuses organic emission control primarily on ozone precursors. The carbon equivalence approach not only obviated the need to adjust the standard for or otherwise consider the mass of oxygen (which is not of itself a reactive agent) contained in methanol vehicle emissions, but also allowed the scientifically meaningful application (in terms of ozone potential) of the current numerical value of the standard to a new fuel.

As an alternative, EPA requested comments on a more empirical approach to setting standards. This approach would rely on the results of photochemical modeling to establish standards that would result in methanol vehicles having ozone potential equivalent to gasoline vehicles. In describing this alternative, the Agency noted the currently limited number of photochemical modeling studies upon which such standards would have to be based and indicated that significant uncertainties existed in translating modeling results into meaningful standards. Nonetheless, the Agency's preliminary analysis in the NPRM suggested standards of this type might be somewhat less stringent and less costly than the carbon-based standards.

The Agency also asked for comments regarding the need for separate formaldehyde exhaust standards to prevent excess emissions of this highly photochemically reactive compound from some methanol vehicles.

*Summary of the Comments.* No comments were received disputing EPA's preliminary finding in the NPRM that the proposed carbon-based standards would adequately limit the ozone producing potential of methanol vehicles relative to current vehicles. In fact, most commenters found EPA's proposed standards acceptable. The carbon-based standards were described as being scientifically reasonable, environmentally sound, and technologically feasible using control hardware similar to that used on current vehicles at a similar cost. Only two comments questioned the feasibility of complying with the carbon-based standards for exhaust emissions. Ford presented emission data showing that some prototype vehicles would be able to meet the photochemical modeling-based standards but not the proposed carbon-based standards. Ford did not argue that the carbon-based standards were infeasible but rather that the photochemical modeling-based standards were less stringent. GM presented data, based on limited testing of light-duty vehicles, which showed levels of organic emissions well below the carbon-based standards. Caterpillar stated that its prototype heavy-duty engine was expected to fail the standards by a factor of two due to high methanol emissions at light load conditions, but provided no test data to support this claim. No comments were received disputing the feasibility of the proposed evaporative emission standard.

Many of the commenters supporting the proposed carbon-based standards also believed insufficient information was available with which to develop acceptable photochemical modeling-based standards. Some stated that such a standard-setting approach would require more modeling studies than had been performed and that these studies might need to consider multi-day ozone episode effects. (Multi-day modeling is more complex than single day modeling and depends on a more detailed input data base.) Several commenters expressed serious reservations concerning the inherent difficulties and environmental risk associated with setting nationwide standards purporting to provide the same ozone protection from methanol-fueled vehicles as from petroleum-fueled vehicles. These reservations were based on the fact that

photochemical modeling is capable of considering only a limited set of meteorological and pollutant inventory circumstances for a limited set of specific cities.

A few members of the automobile industry suggested that photochemically-equivalent standards could be adequately identified and should be adopted. Notably, Ford felt that sufficient modeling had already been performed to allow promulgation. Ford discussed its own analysis which modeled the impact of methanol use in 20 cities. GM stated that such standards could be developed based on multi-day modeling of six metropolitan areas.

The commenters supporting the photochemical modeling-based standards did so because they believed such standards would be less stringent and less expensive. As discussed previously, Ford submitted test data which show that the photochemical modeling-based standards discussed in the NPRM were easier to meet than the carbon-based standards. None of the commenters, however, submitted data that could be used to develop a quantitative estimate of any economic benefit that might result from adopting standards based on photochemical modeling. GM specifically stated that it was unable to make an estimate in this regard.

Several commenters felt that separate formaldehyde standards should be adopted to ensure adequate control of this highly photochemically reactive compound. Specifically, the California Air Resources Board (CARB) suggested separate formaldehyde standards for the various classes of vehicles that would limit this pollutant to the levels of current vehicles. Two commenters questioned the present feasibility of separate formaldehyde standards, while others felt there was insufficient data upon which to base such a requirement.

*EPA Response to Comments.* The Agency has reviewed the environmental adequacy and technical feasibility (including a consideration of stringency relative to current gasoline-fueled vehicle standards) of the proposed carbon-based organics standards in light of information provided by the various commenters, as well as additional information obtained by EPA. Turning first to the issue of environmental adequacy of the standards, the reanalysis included Ford's newly available modeling results for 20 cities along with new fleet-average emission factors for methanol vehicles developed from an expanded emission factor data base. The results indicate that methanol vehicles produced in compliance with

<sup>9</sup> This modeling is described in detail in the Summary and Analysis of Comments document (docket item A-84-05-V-B) as well as the NPRM's Regulatory Support Document (docket item A-84-05-III-A-3).



the carbon-based standards would have about 54 to 95 percent of the ozone-producing potential of current gasoline vehicles (depending on the city and study under consideration). Therefore, the Agency agrees with the commenters that this standard-setting approach is sufficient to prevent a degradation in ambient ozone air quality levels from occurring as a result of methanol vehicle operation.

Turning next to the question of technical feasibility, there were no comments opposing EPA's finding in the NPRM that the proposed carbon-based evaporative emission standards were achievable using currently available control technology, so the feasibility of this requirement is not an issue. Regarding the proposed carbon-based exhaust standards, however, several remarks were received concerning the ability of prototype vehicles to meet those standards using currently available control technology.

In evaluating these comments, EPA believes it is important to recognize that they are based on the results of prototype vehicle development programs. The goals of these programs were not aimed at compliance with emission standards specifically designed for methanol vehicles. Even though Ford's comments indicate only a limited amount of development work was done to reduce methanol vehicle emissions, the data presented by Ford show that the majority of prototype vehicles could meet the proposed exhaust standards at the low to moderate mileage accumulation levels attained by the test vehicles. Further, when vehicles that did not meet the proposed CO and NO<sub>x</sub> standards—which Ford did not argue are infeasible—are excluded from Ford's data, all of their vehicles emit at levels below the carbon-based organics standard. GM's data are somewhat less useful since there is no indication of CO or NO<sub>x</sub> levels. The data do, nevertheless, support the feasibility of the organic standards. Numerous other comments were also received supporting the technical feasibility of meeting the proposed exhaust standards using currently available technology. Insufficient information on the emission-related goals of Caterpillar's prototype development program was provided to assess whether or not that company's claim that its engines presently emit organics in excess of the proposed standards means that the standard itself is infeasible.

On the whole, considering relevant data and comments on the feasibility of the carbon-based standards for both

light- and heavy-duty vehicles, EPA finds no basis to alter its earlier conclusion that the proposed carbon-based exhaust and evaporative emission standards are attainable using emission control technology similar to that used on current vehicles at similar costs.

The Agency also studied the environmental adequacy and feasibility of photochemical modeling-derived standards. In evaluating this approach to standard setting, two important questions must be considered: first, can adequate photochemical-modeling based standards be derived, and second, from environmental and cost perspectives, do these standards necessarily represent a superior standard-setting approach?

In order to assess the appropriateness of standards derived from photochemical modeling, it is necessary to examine the quality of the available modeling studies themselves, and the amount of modeling data available. In addition, to date only a limited number of modeling studies have been performed. Of these, EPA finds only three that have value for the purposes of developing standards. Two of the studies were performed by Systems Applications, Inc. (SAI), and modeled the effect of methanol fuel substitution on ozone levels in Los Angeles and Philadelphia.<sup>10 11</sup> Both SAI studies have similar methodologies. Each evaluated methanol's impact over one day periods. Each employed an "airshed" model (three dimensional, citywide modeling grid) to define the trajectory of the single air parcel which, in the base case (no methanol use), developed the maximum one-hour ozone concentration. Each employed the less complex "trajectory" model, focusing on the previously identified air parcel, to evaluate subsequent scenarios with various levels of methanol substitution. Finally, each expended substantial effort to develop city-specific input data, including emissions and meteorological information.

The third study was performed by Ford and discussed in its comments to the NPRM. The study evaluated single day ozone episodes for 20 non-attainment areas outside California (including Philadelphia) using a trajectory model only. Simplified, linear trajectories were assumed, and default emissions speciation factors, identical in all cities, were applied. These

<sup>10</sup> G.Z. Whitten, H. Hogo, Systems Applications, Inc., "Impact of Methanol on Smog: A Preliminary Estimate," Publication No. 83044, February 1983.

<sup>11</sup> G.Z. Whitten, N. Yankow, T.C. Myers, Systems Applications, Inc., "Photochemical Modeling of Methanol-Use Scenarios in Philadelphia," Publication No. EPA 460/3-88-001, 1988.

simplifications limit the representativeness of the results for any particular city. Additionally, Ford's modeling, by design broad in scope, was limited in depth to only four runs per city.

Unfortunately, as discussed in the Summary and Analysis of Comments, all the studies are deficient to varying degrees. Review of the available information shows that although the current studies are very useful in estimating the potential impact of methanol vehicles they are inadequate for the purpose of promulgating photochemical modeling-based standards.

Of course, many of the limitations could be addressed by further modeling, as suggested by GM. But sufficient modeling would likely take years to complete (precluding application to this rulemaking). EPA therefore considered whether it might be possible to use the currently available data by accounting in some fashion for the uncertainty associated with it. As will be shown, however, the benefit of photochemically-derived standards over carbon-based standards remains unclear based on this analysis. The uncertainty in this regard follows from a consideration of the method EPA would need to use to set environmentally acceptable requirements.

The mathematical expressions used to derive photochemically equivalent exhaust and evaporative standards include factors to account for the relative photochemical reactivities of methanol and formaldehyde when compared to the non-oxygenated HC emitted from current vehicles. Relative reactivity as a concept implies that organic compounds can be characterized as having a given amount of ozone potential relative to the "typical" (or "average") organic emission. This ozone potential is quantified as the amount of ozone produced by a given pollutant relative to that produced by the same amount of the average hydrocarbon mixture. The Summary and Analysis of Comments document provides a detailed discussion of the modeling technique used to quantify these relative reactivities. Relative reactivity values are then used in the mathematical formulation of the standard to weight each pollutant according to its ozone producing potential. Attaining the goal of equivalent ozone potential, therefore, involves choosing the relative reactivities for methanol and formaldehyde so that no area experiences a change in ozone air quality from methanol vehicles.

Three approaches were identified for choosing these relative reactivities. The first approach uses the average relative reactivities for methanol and formaldehyde from all of the photochemical modeling studies.

Consideration of this first approach showed that attaining exactly equivalent ozone potential for methanol vehicles is not feasible, given differences in local air chemistry. Thus, the other approaches considered involved worst case assumptions to ensure that no area would suffer a degradation in air quality due to their use.

The second approach uses the relative reactivities of the worst-case city in the modeling data base. The problem with this approach is that the worst-case city would almost certainly change with time. This would occur because the ratio of methanol reactivity to formaldehyde reactivity is different for each location, making ozone production dependent on the relative mixture of methanol and formaldehyde emissions from methanol vehicles. Over a period of time the emission characteristics of methanol vehicles (*i.e.*, the ratio of methanol to formaldehyde emissions) will likely vary due to changes in fleet mix or vehicle technology. The end result is that the standards would need to be revised in the future to ensure adequate environmental protection.

The third approach uses the highest relative reactivity for each pollutant from the modeling studies regardless of city. With this method, the ozone-producing potential of methanol vehicles in any city would not exceed that for current vehicles. This approach addresses the chief deficiency of the previous two approaches because no area would be expected to experience an increase in ozone and some protection is afforded from future ozone increases due to changes in the methanol vehicle fleet.

While none of the three approaches is ideal, the final method would do the most to ensure that there is not an increase in ozone levels due to methanol vehicle use. (An example of the mathematical formulation of the standard as derived using this final method is given in the Summary and Analysis of Comments.)

Now that a methodology for deriving photochemical modeling-based standards has been identified, the current modeling studies and methanol emissions data base can be used to explore the potential benefit of such standards compared to the carbon-based standards. When the expected ratios of *exhaust* organics from methanol vehicles are applied to the

formulas for the carbon-based and photochemical modeling-based standards, the result is that the two alternatives appear to allow roughly the same amount of total carbon to be emitted, with the photochemical modeling-based standards being slightly more stringent for the average vehicle in EPA's methanol vehicle emission factor data base. The fact that the carbon-based standards appear less stringent differs from EPA's earlier tentative conclusion presented in the NPRM, which was that, based on the single modeling study then available, modeling-based standards would be the least stringent alternative. It is also at odds with the views expressed by several of the commenters who favored the modeling-based approach, believing it would be less stringent.

As mentioned in the earlier discussion of the feasibility of the carbon-based standards, Ford did present exhaust emission data for 17 vehicles. This can be used to demonstrate the small difference between carbon-based and photochemical modeling-based standards. When those vehicles that did not meet the proposed CO and NO<sub>x</sub> standards are excluded from the data base, the remaining eight vehicles all met the carbon-based standards. All eight met the sample photochemical modeling-based standards given in the NPRM. Seven of the eight met the new standards, derived using the more recent modeling results. Thus, Ford's data do not show that modeling-based standards are less stringent in the case of exhaust emissions. Rather, they tend to support EPA's assertion that the opposite is true. They also show that for catalyst-equipped vehicles, achieving the CO standard may be the primary technological determinant for meeting either of the alternative exhaust organics standards.

Evaluating the relative stringency of the *evaporative* emission standards is much more straightforward. These emissions do not contain formaldehyde and the photoreactivity of methanol compared to the emissions from current vehicles is low. The net result is that evaporative standards based on photochemical modeling will always be less stringent than carbon-based standards. To place this in perspective, the currently available information indicates that methanol vehicles certified to photochemical modeling-based standards could emit about 25 percent more total carbon than under carbon-based standards. This situation could result in smaller evaporative control canisters and a lower cost of controlling evaporative emissions from methanol vehicles. Unfortunately, no

comments were received upon which an estimate of the savings associated with the less stringent approach could be based. This analysis does not account for the fact that the low volatility of methanol acts to decrease evaporative emissions. Thus, while the modeling-based standards may allow more total carbon to be emitted, it is not obvious that this represents a meaningful relaxation in the stringency of the standards.

Overall, the available information indicates that photochemically-derived exhaust standards may be slightly more stringent relative to the proposed carbon-based approach. It is presently unclear, however, if this small increase in stringency would result in any difference in the cost of compliance. Conversely, the photochemically-based evaporative standards may be less stringent, but whether there is any economic benefit to this difference is also unknown. When the exhaust and evaporative standards are viewed together and the uncertainties in the analysis are considered, the Agency believes the two standard-setting approaches can be regarded as yielding comparable environmental protection, with generally similar total compliance costs. GM's inability to make an estimate of any difference in regard to the cost of compliance under these approaches supports this argument, especially considering that the difference between the two approaches GM was comparing was much greater than when the updated modeling studies are the basis for reactivity-based standards.

In summary, the Agency's analysis of the proposed carbon-based standards shows they are sufficient to prevent any increase in ambient ozone levels from the use of methanol vehicles, and that they should be achievable using emission control technology similar to that used on current vehicles. The analysis also leads to the conclusion that there is no obvious advantage to implementing standards based on photochemical modeling, especially in light of the inherent analytical difficulties associated with such a standard-setting approach. The Agency has decided, therefore, to promulgate standards as proposed, based on a carbon equivalence to existing HC standards, rather than to pursue the modeling-based alternative.

It should be noted that, under the standards being promulgated today, most areas which adopt a methanol fuel program will experience the equivalent of a decrease in ozone precursors. For example, EPA estimates the equivalent

HC reductions for light-duty methanol vehicles meeting today's standards to be:<sup>12</sup>

34 percent for exhaust HC.

71 percent for evaporative HC (when compared to a 11.5 psi gasoline).

32 percent for evaporative HC (when compared to a 9.0 psi gasoline).

The Agency will continue to recognize these credits for states which incorporate an alternative fuels methanol program into their SIPs. Furthermore, a state may, at its option, model the ozone forming potential of an alternative fuels strategy, and adopt different HC reduction figures as appropriate.

In response to the comments regarding the need for separate formaldehyde standards for ozone control, EPA agrees that this pollutant deserves special consideration because of its high photochemical reactivity. The Agency's review of this issue, using the previously discussed photochemical modeling studies and methanol emissions data base, indicates that the fleet-average methanol vehicle certified to the carbon-based standards will have 54 to 95 percent of the ozone forming potential relative to current vehicles. These results indicate that a separate ozone-related standard for formaldehyde is not needed, since the carbon-based standards will most likely limit average formaldehyde emissions to acceptable levels. Therefore, EPA disagrees with the commenters that a separate formaldehyde standard is presently needed. As noted elsewhere, EPA will test production vehicles for formaldehyde emissions; if the Agency finds that formaldehyde emissions on average exceed the levels current data suggests, EPA will reconsider establishing separate formaldehyde standards. Since methanol vehicles will not become numerous enough to affect air quality until well into the next decade, there will be time for EPA to establish separate standards if they prove necessary. (The possibility of a separate standard to protect against the direct health effects of formaldehyde exposure is discussed in Section III.B.3, "Separate Health Effects-Based Standards.")

## 2. Optional Combined Exhaust and Evaporative Standards

*Review of the Proposal.* Although not specifically proposed, EPA discussed the possibility of creating optional combined exhaust and evaporative organic emissions standards that would allow increases in evaporative

emissions to be offset by reductions in exhaust emissions. This trading scheme was considered in the belief that it might have some benefit in providing manufacturers with the flexibility to decide the most cost-effective approach to controlling a vehicle's total organic emissions. Allowing manufacturers to trade reduced evaporative emissions for increased exhaust emissions was not being considered since the evaporative standards were designed to essentially eliminate the fuel component of any HC emissions measured in evaporative testing. Thus, allowing manufacturers to trade non-fuel emissions for increased exhaust emissions could result in "gaming" of a combined standard, with associated negative environmental effects. Despite the potential benefits of the trading scheme, however, EPA noted several difficulties associated with such standards. In this regard, comments were specifically requested on the environmental risks that might accompany the alternative standards as well as methods for establishing an equivalency between exhaust and evaporative organic emissions. Comments were also requested concerning the expected size and associated value of any increase in evaporative emissions that this alternative would precipitate.

*Summary of the Comments.* Most of the comments concerning the optional combined organics standards came from the automotive industry. The manufacturers of heavy-duty engines argued that such standards would not provide a benefit to their segment of the industry. They pointed out that heavy-duty engines and vehicles are generally manufactured by different companies (*i.e.*, the industry is non-integrated), making the use of any combined certification approach a remote possibility. In fact, the heavy-duty engine manufacturers felt combined standards would actually create an unnecessary administrative burden.

The concept received mixed reactions from the light-duty motor vehicle manufacturers. Toyota opposed the option claiming it would actually increase the number of evaporative tests per vehicle family. The majority of the commenters, however, expressed moderate interest in combined standards, but no manufacturer submitted information concerning the expected amounts of the offsets which might occur or the value of the option. Ford and GM suggested it could be possible to establish the equivalency between exhaust and evaporative emissions and maintain adequate environmental protection, but neither

offered a specific methodology for accomplishing this.

Finally, a single commenter from the oil industry, Chevron, opposed the concept, stating that the establishment of an environmentally benign equivalence between evaporative and exhaust emissions would be difficult based on the information currently available.

*EPA Response to Comments.* The Agency notes that support for the concept of combined standards was not enthusiastic. The heavy-duty engine industry commenters and one major light-duty manufacturer opposed the concept. It is not obvious, however, that implementation of such a program would cause any significant administrative burden for non-integrated heavy-duty engine manufacturers, since they are in fact currently responsible for evaporative certification. Additionally, as far as they or any manufacturer of heavy-duty or light-duty vehicles is concerned, since the program would be optional, no manufacturer who would be harmed by its use need adopt it.

Only a few light-duty manufacturers supported combined standards, and none addressed the fundamental uncertainties associated with the approach, as expressed in the NPRM. One of the Agency's primary concerns centers on whether the alternative standards have any value to manufacturers. EPA's skepticism in this area is related to the nature of the evaporative emission standards and the type of technology which is used to control these emissions. As explained in the proposal, the present evaporative standards were designed to essentially eliminate emissions from fuel-related sources. For example, the light-duty vehicle standard of 2.0 grams HC per test was implemented to account for background sources of HC (*e.g.*, interior materials and lubricants), to accommodate some degree of test-to-test variability, and to provide some compliance cushion. Hence, the standards require essentially the complete elimination of fuel-related emissions.

Present evaporative emission control systems function by routing gasoline vapors from the vehicle's fuel tank and engine to a charcoal-filled canister where they are stored. When the engine is started, the vapors are purged from the canister, routed to the engine, and burned as fuel. If the canister becomes saturated with evaporated gasoline, the excess vapors are vented directly to the atmosphere, causing the emissions from such a vehicle to increase substantially.

<sup>12</sup> From EPA-AA-TSS-PA-87-4.

The interaction between this characteristic of the requisite control hardware and the nature of the evaporative standards which are designed to allow no fuel emissions means that either a vehicle's control system will capture essentially all fuel-related emissions, or it will generally fail the emissions test dramatically. This "all or nothing" situation makes it very difficult to design a vehicle to emit only a little excess evaporated fuel, which is the likely emission control strategy that would need to be followed to take full advantage of combined standards. The data on evaporative emissions for methanol-fueled vehicles are much more limited than those for gasoline-fueled vehicles. Nevertheless, the fundamental characteristics of the evaporative control system are expected to be similar regardless of fuel type, and these same uncertainties would apply to either vehicle type as well. For this reason, EPA questions the practical value of such an optional program for methanol vehicles. No manufacturer provided any information which might allay the Agency's uncertainty in this regard.

An even more fundamental concern to the Agency involves the method used to determine the environmental equivalency between evaporative and exhaust emissions. The method presented as an example in the NPRM attempted to convert evaporative emissions, as measured in grams HC per test, to an exhaust equivalent expressed in grams per mile. Because in-use evaporative emissions are a strong function of driving patterns, the conversion process involves the use of assumptions regarding important driving-related parameters. Among these are the number of miles driven per day and the number of vehicle trips per day. While average values can be derived for the relevant driving-related parameters, it is not clear that they would correctly weight the different driving habits. Thus, an accurate assessment of all typical driving patterns and their associated emissions effects would be necessary in order to convert evaporative emissions test data to in-use emission factors. This situation is further complicated in that in-use exhaust and evaporative emissions are affected differently by local climate, with the result that an equivalence established under FTP test conditions is less accurate for other conditions. Given the limited amount of information now available, EPA concludes (in agreement with Chevron) that the available information is insufficient to establish an environmentally benign equivalence

between exhaust and evaporative emissions.

To summarize and conclude, the Agency's analysis of optional combined exhaust and evaporative standards for methanol vehicles shows that such an alternative is of dubious value to the regulated industry. The analysis also shows that deriving an equivalence between exhaust and evaporative emissions would be extremely difficult based upon currently available information. Commenters presented no data which could have been used to resolve these uncertainties, making it difficult to proceed with the program. Furthermore, since the goal of this rulemaking is to establish a level playing field for methanol vehicles, it would not be appropriate, especially in light of these uncertainties, to provide special options for methanol vehicles. Therefore, the Agency is taking no action with regard to optional combined exhaust and evaporative emission standards as part of today's final rule.

### 3. Separate Health Effects-Based Standards

*Summary of the Proposal.* In the NPRM, EPA noted that direct exposure to methanol and formaldehyde emissions from methanol vehicles could pose a public health risk due to acute toxic or, in the case of formaldehyde, carcinogenic health effects. Further, the question of whether this risk would be adequately addressed by the proposed ozone-related standards was evaluated in order to investigate the need for separate health-based standards for methanol and formaldehyde. The discussion below concerns EPA's analysis of these issues at the time of the proposal; EPA's current analysis is described in the "EPA Response to Comments" section.

The Agency's analysis of potentially acute toxic effects initially focused on identifying ambient concentrations for each pollutant above which adverse effects might be anticipated for normal individuals in the population at large. These concentrations were specifically chosen in the context of the short, perhaps repetitive exposures generally expected to be associated with motor vehicles. The resulting levels of concern were then used as an analytic tool to evaluate a variety of exposure scenarios to assess the potential public health risk. See the Regulatory Support Document (docket item #A-84-05-III-A-3) for details related to the selection of these levels of concern. These levels were not intended to be cutoff points for regulatory action; clearly, determining the need for regulatory action requires

consideration of other factors such as the potential frequency, length, and avoidability of exposures to high concentrations of methanol and formaldehyde and the Agency's legal authority to establish standards addressing such exposures. Thus these levels of concern were intended to serve as warning flags, which draw attention to scenarios where there is a potential for significant health risks for the public.

The analysis indicated that the proposed carbon-based standards should be sufficient to prevent toxic concentrations in all scenarios evaluated except those relating to formaldehyde exposure in the personal parking garage. Additionally, methanol and formaldehyde concentrations were predicted to approach levels of toxic concern in the personal and public parking garages, respectively. Even in these exposure scenarios, the view stated in the proposal was that the anticipated acute effects were expected to be reversible and minor in nature (*i.e.*, slight irritation of the eyes for the case of formaldehyde; increase in urine levels for methanol). The personal garage scenario in which formaldehyde concentrations were of concern involved an improperly maintained vehicle, starved and left to warm up for five minutes. The concentration approaching the level of concern would be experienced between the time the driver returned to his or her garage and when he or she drove away. Since the biological effects experienced were thought to be limited to annoyances like eye irritation or for sensitive individuals respiratory tract irritation, or would be accompanied by unpleasant odor, the proposal stated that the driver would have incentive to avoid the exposure by removing the vehicle from the garage prior to warm-up or by repairing the vehicle. Just as with CO emissions from current vehicles, EPA found in the proposal that it would be reasonable to expect owners to assume primary responsibility for avoiding an obviously unsafe practice like idling a vehicle in a garage. Also, it was uncertain whether a standard would have any benefit in this scenario, since standards apply to well maintained vehicles. As a result, no standard was deemed necessary.<sup>13</sup>

<sup>13</sup> In this scenario, as well as in the public parking garage scenario, methanol from malfunctioning vehicles at idle was found to approach the level of concern, but in each case the margin between predicted concentrations and the level of concern was greater than for formaldehyde. Thus formaldehyde was seen as the limiting factor and the analysis concentrated on the need for its control.

The scenario in which formaldehyde in the public parking garage approached the level of concern required complete market penetration of methanol vehicles and a very poorly ventilated garage. The parking garage scenario of concern also included the extreme conditions that all of the vehicles would be started and allowed to idle within a short period of time, and that 25 percent would have severely malfunctioning emission control systems. The Agency decided against regulatory action based on the low probability of the assumed conditions occurring simultaneously and the uncertainties in the emission factor data base.

The scenario involving exposure to evaporate methanol emissions in the personal garage concerns a hot vehicle sitting in a completely sealed garage with no ventilation and with the evaporative emissions control canister disconnected. Again, this scenario is only a potential problem when the owner remains in the garage for an extended period. Even in this case, the concentration was predicted only to approach the level of concern. Since at the level of concern, based on accepted scientific understanding, the health effects experienced were expected to be minor and reversible and since an emission standard would do little to control emissions when the evaporative control canister is disconnected, no standard was deemed necessary.

The concerns regarding potential carcinogenic health effects focused on exposures to ambient concentrations of formaldehyde, a chemical that had been found to cause cancer in laboratory animals. The Agency's analysis of this issue in the proposal showed there were considerable uncertainties pertaining mainly to formaldehyde's carcinogenic potential in humans and the carcinogenic risk posed by methanol vehicles relative to that posed by other sources, including existing mobile sources. The low expected initial market penetrations of methanol vehicles would provide time to resolve the present uncertainties without undue risk to public health. Therefore, the Agency deferred action on cancer-related standards for methanol vehicles until the relative contribution of all sources in the ambient environment to the carcinogenic risk of this pollutant was better understood.

*Summary of the Comments.* The NPRM drew a wide range of comments covering almost every aspect of EPA's health effects assessment. A few commenters expressed the concern that EPA had relied on a very limited emissions data base in deciding not to

propose separate health-based standards. One cited an EPA statement in the proposal about the difficulties of translating the limited amount of test data into reliable in-use emission factors. The American Gas Association expressed the strongest opinion in this area, citing limitations in the formaldehyde emissions data base as one reason that no methanol vehicle standards should be promulgated at this time.

Several comments addressed EPA's level of concern (chosen for scenarios lasting less than 15 minutes, which may be repeated) for formaldehyde and methanol. Several organizations felt that EPA's 0.50 milligram per cubic meter ( $\text{mg}/\text{m}^3$ ) level of concern for formaldehyde was inadequate to protect the public health. Findings from the National Research Council were cited which indicated that sensitive individuals will encounter eye irritation at formaldehyde levels as low as 0.05 ppm (1 ppm =  $1.16 \text{ mg}/\text{m}^3$  at 70 °F) and in the presence of other pollutants at levels as low as 0.01 ppm. It also stated that 10 to 12 percent of the population has no threshold below which effects do not occur. No comments were received specifically opposing the  $260 \text{ mg}/\text{m}^3$  (1 ppm =  $1.24 \text{ mg}/\text{m}^3$ ) level of concern for methanol.

General Motors (GM) supported both levels of concern, stating that the level of concern for methanol should prevent unsafe levels of this substance and its metabolites from accumulating in the blood of exposed persons. It also concurred with the Agency that any health effects at the level of concern for formaldehyde would be minor and reversible.

The automotive industry in general as well as the DOE agreed with EPA that the proposed carbon-based standards should adequately protect the public from exposures to toxic levels of methanol and formaldehyde. The California Air Resources Board argued that where predicted concentrations approximate or exceed the level of concern, as is the case for garages, regulatory action is warranted.

The commenters also addressed the carcinogenic risk associated with ambient concentrations of formaldehyde. Several comments were received in this regard opposing EPA's position, which was that no separate standards specifically for methanol vehicles are warranted now but that the complexities of the issue warrant further study. The California Air Resources Board stated that according to EPA's cancer risk assessment guidelines, formaldehyde would be considered a

probable human carcinogen based on the available animal test results. It went on to suggest specific standards that would limit formaldehyde from methanol vehicles to the levels of current vehicles. (These standards were also discussed in Section III.B.1, with reference to formaldehyde's photochemical reactivity.)

On the other hand, Chrysler and GM were unconvinced of formaldehyde's carcinogenic risk and opposed consideration of standards to protect against it. These manufacturers cited a recent study of industrial workers by the National Cancer Institute, which they claimed showed no excess cancer mortality due to formaldehyde exposure. GM agreed with EPA that there is adequate time to further investigate the cancer risks of formaldehyde before methanol vehicles enter the fleet in large enough numbers to be a special concern.

*EPA Response to Comments—Adequacy of Emissions Data.* One of the most fundamental issues raised in the comments pertains to EPA's use of limited emission factor data and the resulting reliability of the health effects assessment. This topic was discussed in the proposal, and EPA concluded that the existing data appeared sufficient to adequately characterize methanol vehicle emissions for the purposes of the NPRM but that improvements in the data base would be desirable in several key areas.

New emissions data has become available since the proposal was published. The methanol vehicle emissions data base presently contains test results for 14 models of prototype and first generation vehicles from 15 different studies.<sup>14</sup> A substantial amount of information regarding city and highway-cycle exhaust emissions as well as evaporative emissions, and to a lesser extent cold start idle emissions, has also been added to the information base. These recent additions have improved EPA's ability to project in-use emissions and have been used to reassess the need for separate health-based standards. Further improvements in the data base would still be useful, especially as regards cold idle emissions. As mentioned later in this notice, EPA will collect more emission data as methanol fueled vehicles are

<sup>14</sup> This database is discussed in detail in Gold, Michael, and Moulis, Charles, "Emission Factor Database for Prototype Light-Duty Methanol Vehicles," SAE Paper 872055, and updated in "Effects of Emission Standards on Methanol Vehicle Related Ozone, formaldehyde, and Methanol Exposure," by the same authors, Air Pollution Control Association Paper 88-41.4.

developed and will revisit this analysis as the information warrants.

The new data differ most substantively from the old in the areas of idle and evaporative emissions. The data base now contains some actual cold start idle data for methanol vehicles. The data range from 8–122 mg/min for formaldehyde and 0.85–4.85 g/min for methanol over a five minute averaging period. The emissions of formaldehyde and methanol used in the NPRM analysis (0.04–2.03 mg/min formaldehyde and 0.002–0.043 g/min methanol) were *estimated* using data from warmed-up vehicles. While the new data are an improvement over the old, the idle emissions data base for methanol vehicles is still limited. Only two models, the Ford Escort and the Toyota Carina, have been evaluated. As will be discussed in the section on exposure scenarios below, the Escort technology, which establishes the upper limit of the range on formaldehyde emissions, is unrepresentative of technologies that will ultimately be marketed. The Carina, which is more optimized with respect to emission control technology and which establishes the lower limit of the range, has been tested only at room temperature, which is not a worst case condition. Furthermore, idle methanol emissions for the Carina were not measured. EPA believes that, in the absence of emission standards to limit idle emissions (other than the FTP organics standards, which will likely have some limiting effect on idle emissions), the range given by these vehicles should be interpreted as a set of possible emission levels. It will not be possible to determine more accurately what actual idle emissions will be until the methanol vehicles that will ultimately be marketed become available for testing. (As will be noted in the conclusion to this section, EPA intends to obtain data in this regard as soon as is practicable.)

Formaldehyde data for gasoline and diesel vehicles and carbon monoxide data for all technologies are useful in placing the anticipated health effects of formaldehyde emissions from methanol vehicles into perspective. Recent formaldehyde data for gasoline vehicles (previously estimated to emit at a rate of 1.1 mg/min) have extended the range of data upward to 20 mg/min for low mileage, well maintained, catalyzed vehicles. A range of up to 76 mg/min has been measured for pre-catalyst gasoline vehicles. Testing of a single low mileage diesel vehicle showed formaldehyde emissions of up to 24.3 mg/min. Carbon monoxide emissions data for methanol

and gasoline vehicles are also available and will be discussed later.

Hot soak evaporative emission data were also very limited at the time of the NPRM. The new data indicate that worst case hot soak emissions of methanol should in fact be less than were previously thought (2.0 g/hr instead of 3.0 g/hr).

The reader is referred to the Summary and Analysis of Comments document for a more detailed presentation of the emission data discussed here.

*Toxicity of Formaldehyde (Non-Cancer).* The arguments presented by the commenters opposing the level of concern for formaldehyde were previously addressed in the NPRM, and no new information was submitted for the Agency's consideration. To briefly reiterate the Agency's analysis of this issue, the acute effects noted in clinical studies with formaldehyde concentrations below the level of concern (0.50 mg/m<sup>3</sup>) are expected to be non-serious and reversible for most of the population with the caveats listed below (see the Regulatory Support Document for details). Furthermore, these findings may be conservative for the vast majority of the population, because the clinical exposures were usually of greater duration than the relatively brief exposures (less than 15 minutes), at or approaching this level, expected to be associated with methanol vehicle-related formaldehyde. In reaching this conclusion, the Agency notes that there is a wide variability in the responses of individuals to various levels of formaldehyde. Thus irritant effects, if any are experienced, may first occur for some individuals at levels above or below 0.50 mg/m<sup>3</sup>. The Agency does not wish to imply that exposures to concentrations below the level of concern are always acceptable; however, the Agency believes that effects will generally be minor at this level for the vast majority of the population. In the absence of new information to the contrary, the Agency believes its original conclusions remain valid and finds no reason at present to alter the previously identified level of concern for formaldehyde.

Acute effects at levels above the level of concern would generally be limited to eye and respiratory tract irritation of concentration-related severity. It is noted that research data do indicate that an inurement to irritant effects tends to occur after several minutes of exposure. Evidence suggests that pulmonary effects could also occur, resulting in temporarily reduced lung function. Those with existing respiratory problems, asthmatics for example, may

experience more adverse effects. Notably, the National Research Council analysis cited by the commenters attempted to quantify the sensitive population fraction based on general allergic tendencies not reaction to formaldehyde in particular.

It has been suggested that exposure to formaldehyde at irritant levels (*i.e.*, above the level of concern) may cause individuals to become hypersensitive to formaldehyde. Individuals sensitized in this fashion would later exhibit allergic (*e.g.*, asthmatic) reactions when exposed to low concentrations of formaldehyde. While such a relationship has been suspected, there is no definitive evidence for allergic sensitization to inhaled formaldehyde.

Evidence suggests that repeated exposure to formaldehyde at irritant levels (*i.e.*, above the level of concern) for short durations may result in some cumulative health impacts, such as permanently reduced lung function. This suggestion is appropriately characterized as speculative at present, since it is not based on the study of formaldehyde exposures of the sort described here. Rather, it is based on formaldehyde's effects in long term, lower concentration, residential and occupational exposures, and on irritant mechanisms associated with other toxins.

The Agency also discussed the possibility that a small portion of the population may have no threshold below which effects do not occur. For example, as commenters pointed out, studies indicate that a portion of the population may experience eye irritation at concentrations as low as 0.01 ppm (1 ppm 1.16 = mg/m<sup>3</sup> at 70°F). However, these studies are typically based upon occupational exposure, and not the repetitive brief excursions above background concentrations anticipated due to mobile sources. It is also not known how large such a group might be.

The preceding discussion is not meant to imply that the Agency believes that current ambient formaldehyde concentrations are acceptable, nor does it intend to imply that sensitive individuals do not need to be protected. Rather, any program to prevent such low level exposures would require much broader control measures than simply regulating methanol vehicles. To address the question of low level ambient concentrations of formaldehyde, an Agency-wide task force on formaldehyde has been created. This task force will investigate the need and means available for control of ambient formaldehyde concentrations. This investigation will include current

mobile sources, which are contributors to background formaldehyde concentrations.

*Toxicity of Methanol.* Even though no comments were received opposing 260 mg/m<sup>3</sup> as the level of concern for methanol, a recent assessment has become available which supports the appropriateness of this choice (see the Regulatory Support Document for details of this choice). The Health Effects Institute (HEI)<sup>15</sup> recently conducted an extensive review of the potential health effects of methanol exposure and assessed the implications with regard to methanol vehicles.<sup>16</sup> Its general findings included the view that EPA's proposed actions in this rule are currently appropriate. Among HEI's specific conclusions was that the most serious human health effect related to methanol exposure is ocular toxicity due to formate metabolism. A 15-minute exposure at 200 mg/m<sup>3</sup> methanol, under the mobile source-related scenarios evaluated by EPA, would result in a worst case formate body burden many times lower than levels associated with ocular toxicity in humans. However, a firm conclusion regarding chronic exposure cannot be drawn, and alternative mechanisms of methanol toxicity may be associated with other health effects. The HEI report calls for research in these areas. HEI concluded that the available peer reviewed literature produced no evidence on which to base a conclusion that exposure to levels of methanol vapor associated with normal use of methanol as a vehicular fuel would result in adverse health effects. Therefore, the Agency believes this report does not alter the earlier decision to rely upon a level of 260 mg/m<sup>3</sup> as an appropriate focus for concern regarding short duration (15 minutes or so) exposure to methanol.

The Agency wishes to call attention, however, to the results of three recent studies involving laboratory exposure of animals to methanol. In one, pregnant rats were exposed to 6,550, 13,300, and 26,600 mg/m<sup>3</sup> of methanol for 7 hours per day on gestation days 1-19 (only days 7-19 at the high dose).<sup>17</sup> At the two higher concentrations, fetal weights were significantly reduced and an exposure-related number of skeletal and visceral malformations were observed

(although the increase was not statistically significant at 13,300 mg/m<sup>3</sup>). The lowest concentration was not teratogenic. In another study, mature male rats were exposed for 8 hours per day for 1-6 weeks to methanol at 260, 2,600, and 13,000 mg/m<sup>3</sup> methanol.<sup>18</sup> Statistically significant decreased levels of circulating free testosterone were noted in the populations exposed at the two lower levels. Increases in circulating luteinizing hormone were noted in the population exposed at the highest level. Finally, pregnant rats ingested 2.5 g of methanol per kg of bodyweight for one of two 3-day periods during gestation.<sup>19</sup> A number of physiological and behavioral parameters among the rat pups were evaluated. Two parameters showed differences among exposed pups from controls. First, increased latency to suckling behavior 24 hours after birth was noted. Second, exposed pups experienced decreased ability to locate their home nest materials on day 10 after birth. These studies are seen as potentially significant with regard to human exposure to methanol; however, they were not conducted to address the type of exposure concerns noted here (i.e., occasional exposures, lasting less than 15 minutes, to methanol concentrations near the level of concern (260 mg/m<sup>3</sup>)). These studies focused on exposures lasting from several hours to days, with concentrations usually much higher than the public would be expected to be exposed to. Thus it is not possible to resolve this issue at this time.

Research needs to be done to verify and extend these early results, to better characterize dose-response relationships for pertinent health endpoints at low atmospheric concentrations and under varying exposure durations, and to attempt extrapolation of the animal-based data to human beings before prescriptive or prophylactic action is taken with regard to methanol vehicles. It would also be useful to examine human populations epidemiologically for similar health effects. Research may also be needed to address methanol's potential neurotoxicity. In addition, since it is not known whether the formate metabolite of methanol is solely responsible for the reproductive and developmental toxicity of methanol observed in the animal studies, other

mechanisms of methanol toxicity need to be considered as well. This will facilitate improved assessment of potential risks associated with projected human levels of exposure. The Agency in fact, currently plans to pursue some of these issues.

*Exposure Scenarios.* EPA's analysis translated levels of concern into conclusions regarding the need for standards via a series of exposure models which convert emission factors into predicted ambient concentrations. In general, exposures in these scenarios were expected to last no more than 15 minutes, and they could be repetitive. As noted previously, the Agency has updated this analysis with an improved emission data base to help address the concerns that several commenters had in this regard. With a few exceptions, the new analysis is in substantial agreement with the old one. It is discussed in more detail in the Summary and Analysis of Comments. However, as noted before, the new data base differs most substantively in the areas of idle and evaporative emissions. These new data continue to highlight idle emissions in garages as a possible concern, and they remove the personal garage hot soak scenario from the list of potentially hazardous situations.

A substantive change in the analytic approach from that discussed in the proposal is related to the exposure model used for the public parking garage. The previous analysis focused on a model that was based on an actual underground garage, which was poorly ventilated. However, this model is no longer considered representative, since pollutant concentrations inside the actual garage were so high that it had to be completely reventilated. Additionally, in comparing actually measured CO concentrations in the garage upon which the severe scenario was based to reasonable emission rates from the gasoline-fueled vehicles in existence at the time of the measurements, EPA finds that the model may have been overpredicting formaldehyde and CO concentrations by a substantial margin. Therefore, the current analysis is focused on a model of a more typical garage. The model predicts the maximum concentrations that would occur under congested traffic conditions, in which the garage is emptied in a short period of time, such as after a concert. Individuals would be exposed to the highest predicted concentrations in the garage for about four minutes, and to concentrations that are 28 percent as high for another four minutes. For comparison, the concentrations predicted for the severe

<sup>15</sup> HEI is an independent research organization jointly funded by EPA and the automotive industry.

<sup>16</sup> "Automotive Methanol Vapors and Human Health: An Evaluation of Existing Scientific Information and Issues for Future Research," Health Effects Institute, May 1987.

<sup>17</sup> Nelson, B.K., et al., "Teratological Assessment of Methanol and Ethanol at High Inhalation Levels in Rats," *Fund. Appl. Toxicol.* 5:727-736, 1985.

<sup>18</sup> Cameron, A.M., et al., "Circulating Concentrations of Testosterone, Luteinizing Hormone, and Follicle Stimulating Hormone in Male Rats After Inhalation of Methanol," *Arch. Toxicol., Supply.* 7:441-443, 1984.

<sup>19</sup> Infurna, R. and Weiss, B., "Neonatal Behavioral Toxicity in Rats Following Prenatal Exposure to Methanol," *Teratology*, 33:259-265, 1986.

model, which was previously the focus of EPA's analysis, would be about four times the maximum predicted concentrations of the typical model.

EPA's modeling predicts maximum concentrations of 0.25 to 1.0 mg/m<sup>3</sup> formaldehyde for the typical parking garage scenario assuming respectively that the lowest and highest emitting methanol vehicle models in the available data base comprise 30 percent of the total gasoline plus methanol market. The predicted concentration for the same scenario with only gasoline vehicles would be from 0.25 mg/m<sup>3</sup> (assuming average in-use emissions based on low mileage catalyst gasoline vehicles) to 1.05 mg/m<sup>3</sup> (assuming emissions for an older technology, non-catalyst vehicle). Therefore, assuming 30 percent conversion of the fleet to methanol vehicles with high emissions, acute health effects experienced would be similar to those experienced prior to the advent of catalyst technology for gasoline vehicles, and for most of the population would be limited to temporary and mild irritation of the eyes. Asthmatics or others with existing respiratory problems may experience more severe effects of exposure at these levels.

The severe personal garage scenario is predicted to have concentrations ranging from 0.5 mg/m<sup>3</sup> for the lowest emitting methanol vehicle to 16.3 mg/m<sup>3</sup> for the highest after idling in a garage with the door open for five minutes (longer idling times would result in higher concentrations, as would operating with the garage door closed). Concentrations of formaldehyde resulting from idling a gasoline vehicle for five minutes in a personal garage are predicted to be from 0.6-2.7 mg/m<sup>3</sup> for catalyst vehicles to 10.0 mg/m<sup>3</sup> for a non-catalyst vehicle. Acute health effects at the highest predicted levels for methanol or gasoline vehicles would be severe irritation of the eyes, nose and throat for most normal individuals with possible pulmonary function effects. At the lower levels, irritation would likely be slight. Again, the wide variability in human response to formaldehyde is noted. Population subgroups may experience stronger irritation at the lower levels, and asthmatics could suffer attacks at levels intermediate to the predicted range for the personal garage.

For methanol emissions due to cold idling, EPA's modeling predicts concentrations as high as 44 mg/m<sup>3</sup> for the typical parking garage scenario with 30 percent penetration, and 650 mg/m<sup>3</sup> for the severe personal garage scenario. The body burden of formate due to 15

minutes of methanol exposure at 650 mg/m<sup>3</sup> is still expected to be many times lower than doses of acute clinical significance for ocular toxicity.

With the exception of methanol in the public garage scenario, the concentrations noted above significantly exceed the levels of concern for short (less than 15 minutes) exposures to formaldehyde (0.50 mg/m<sup>3</sup>) and methanol (260 mg/m<sup>3</sup>). Whether some form of regulatory action is warranted to protect against health risks in garage-related scenarios depends on a consideration of several important factors.

With regard to the public parking garage scenario, predicted concentrations in typical garages due to methanol vehicles at 30 percent fleet penetration range from levels similar to those experienced today with gasoline vehicles to levels similar to those experienced in the years prior to catalyst technology. (This comparison is given for illustrative purposes only; it is not intended as a finding on the acceptability of current concentrations.) The uncertainties in this analysis are considerable. First, the methanol vehicles from which the highest emissions data were obtained did not meet the proposed carbon-based standard for organic emissions. Over the city driving cycle these 1983 carbureted Ford Escorts emitted at roughly two or three times the allowable level. These vehicles can be considered "gross" emitters and clearly are not representative of vehicles that will ultimately be certified to emission standards. This follows from a consideration of the technology used in the early carbureted Escorts. They are prototype vehicles, representing a minimal design change from the gasoline configuration. Little or no emission control technology specific to methanol vehicles was utilized. Much more recent data for a Toyota Carina, tested at room temperature, were at a level more like that of gasoline vehicles. The formaldehyde emission level of this vehicle is 8.0 mg/min, which is approximately five times lower than that of the worst case Escort at room temperature. Unfortunately cold temperature formaldehyde data and methanol data (at any temperature) are not available for this vehicle. This prevents using it to assess worst case exposures. Nevertheless, the Agency anticipates reductions from the early Escort levels at low temperatures as well. The Carina represents a first step towards an emission control system optimized toward methanol vehicles. The catalyst composition, size, and

mounting location were chosen with methanol vehicle emissions in mind. It is expected that continued development effort will work to reduce idle formaldehyde and methanol emissions further. At this point, it would be appropriate to characterize the lower portion of the range of available emission data as being the more probable.

Next, the cold idle emission rates used in the exposure model were estimated based on a ratio of in-use emissions to certification levels (2.2 for the public garage scenario). This ratio, or emissions offset, applied to each vehicle's measured emission factor, is derived from tests of gasoline-fueled engines operating under FTP conditions. It is not obvious that cold idle emissions from methanol engines would have similar characteristics. In addition, it is worth noting that these offsets are designed to be applied to the emissions level of a vehicle that just meets its standard. As noted previously, the worst case vehicle, upon which the present analysis relied, emitted organics at levels 2-3 times above the proposed standards already. Applying this additional offset makes the predicted concentrations very conservatively high. Additionally, validation data for the typical garage were not available, so that the accuracy of the model could not be determined. These arguments are explored in greater detail in the Summary and Analysis of Comments document.

The uncertainties discussed in this analysis demonstrate that more investigation into cold idle emissions and exposure modeling is necessary before accurate conclusions can be drawn regarding public health risks from methanol vehicles in public parking garages. It would appear very unlikely, however, that methanol vehicles would pose an unacceptable risk in any public garage at the low market penetrations expected in the near future given the relatively mild impacts which the model predicts. The Agency believes this provides adequate time to resolve the present analytical uncertainties, and to reexamine the issue with adequate data.

The concern with idling in a personal garage is somewhat different, since the existence of any toxic effects requires only one vehicle, and thus is not dependent on methanol vehicle market penetration. It is noted that formaldehyde emissions for the vehicle associated with the 650 mg/m<sup>3</sup> methanol concentration were so high that concentrations would exceed the level of concern for formaldehyde by a factor much greater than that for methanol;



while the predicted concentrations of methanol could potentially be of concern, formaldehyde is seen as the more serious concern in this analysis, and as such is the focus of the discussion.

EPA notes that many of the uncertainties (emission factors, validity of the modeling) in the analysis of the public parking garage are also applicable to the personal garage scenario. Thus, just as with the public garage analysis, it is not possible to accurately predict the impact of methanol vehicles at this time, and the predicted concentrations should therefore be considered only preliminary indicators. Table 2 shows predicted concentrations for several technologies.

TABLE 2.—PREDICTED CONCENTRATIONS OF FORMALDEHYDE IN PERSONAL GARAGES

Vehicle	Predicted formaldehyde
Methanol Escort (20 °F) (Early Model)	8–16 mg/m <sup>3</sup> .
Methanol Carina (78 °F)....	0.5–1.1 mg/m <sup>3</sup> .
Catalyst Gasoline Vehicle (20 °F).	1.3–2.7 mg/m <sup>3</sup> .
Non-Catalyst Gasoline Vehicle (70 °F).	5–10 mg/m <sup>3</sup> .
Diesel (20 °F).....	1.6–3.3 mg/m <sup>3</sup> .

This table presents concentrations associated with the highest emitting vehicles available for each technology. The catalyst gasoline and diesel vehicles were well maintained, low mileage vehicles. The non-catalyst gasoline vehicle was a high mileage 1971 vehicle. The upper estimates include a safety factor of 2.0 to account for potential in-use deterioration and other analytical uncertainties. It can be seen that all technologies are capable of emitting sufficient formaldehyde to cause concentrations above the level of concern inside a garage. As noted before, for normal individuals these concentrations would result in various levels of irritation, ranging from slight, perhaps negligible, up to very strong, with the possibility of pulmonary function effects (*i.e.*, reduced lung function). Sensitive individuals may experience stronger irritation at the lower levels. Intermediate concentrations could trigger asthmatic attacks for asthmatics. While these possible effects are clearly significant, EPA continues to believe that current emissions data and the health evaluation are too uncertain to permit an accurate assessment of the potential problem

Additional study of the issue is necessary to resolve outstanding questions. In any event, EPA does not have legal authority under the Clean Air Act to promulgate emission standards to limit formaldehyde or methanol exposures in garages. The Clean Air Act authorizes EPA to regulate only "air pollutants," which the Act defines as substances released to the "ambient air." EPA's longstanding interpretation of "ambient air" is air outside of structures as distinguished from indoor air. The Agency thus lacks adequate authority under the Act to promulgate emission standards to prevent exposures to air pollutants within garages or other structures. However, if the Agency finds that such exposures result in an unacceptable public health risk, then it will consider whether it has authority under other statutes to take regulatory action.

To determine whether methanol will pose an indoor air pollution problem of which the public should be warned, EPA intends to collect idle methanol and formaldehyde data for new vehicles (as they are developed) in the course of its own research, to obtain similar data from manufacturers, to investigate the accuracy of the models, to evaluate the potential for reductions in cold start emissions, and to evaluate health effects data with the intent of establishing a more certain threshold level of concern. EPA has programs in all these areas underway or in the planning phases. EPA expects that manufacturers will continue to warn consumers (via owner's manuals, for example) about the potential hazards of idling vehicles in enclosed places, even open garages. While such warnings have historically been associated with avoiding exposure to high levels of CO, EPA recommends that they also be used to warn the public to avoid situations that could result in high formaldehyde levels.

In addition to collecting more data through its research efforts, EPA will also collect formaldehyde and methanol emissions data on methanol-fueled vehicles undergoing certification testing at EPA facilities. The Agency also will work with manufacturers to collect and analyze other data on formaldehyde and methanol emissions from methanol-fueled vehicles. EPA will promptly make publicly available any new data on formaldehyde and methanol emissions from production methanol fueled vehicles. Further EPA action could include seeking from manufacturers reports on their emissions data and warning labels on methanol vehicles in order to alert sensitive individuals to potential hazards or the conducting of a

public education campaign with the same goal.

**Formaldehyde Carcinogenicity.** The last area of concern raised by the commenters pertains to whether a separate formaldehyde standard is needed to prevent an increase in cancer risk due to increased ambient concentrations of this pollutant. The California Air Resources Board was correct in stating that formaldehyde would be classified as a probable human carcinogen under EPA's guidelines for carcinogen risk assessment. Indeed, the Agency has formally made this classification.<sup>20</sup>

Included in the body of evidence considered in this determination was the National Cancer Institute study cited by Chrysler and GM. Contrary to the commenters' position, however, EPA found that this study did show an excess of some types of cancer among workers exposed to formaldehyde, and the Agency argued that the study favored a finding that formaldehyde should be regarded as a probable carcinogen in humans.

In response to the commenters' recommendation of a separate cancer-related standard, EPA believes that such a standard may not be required, that sufficient data are not now available to make this decision, and that the expected slow rate of introduction of these vehicles allows time for the necessary analysis to be done. Any subsequent standard should be based on quantitative information indicating that methanol vehicles meeting the carbon-based standards will substantially increase ambient formaldehyde levels. No commenter provided evidence to this effect, and the Agency's review of the available information suggests that such will not necessarily be the case. While the data do show that methanol vehicles have the potential to emit substantially more formaldehyde than current vehicles, it is not clear that methanol vehicles will result in significant increases in overall formaldehyde exposure. Ambient formaldehyde levels not only depend on the amount of this pollutant directly emitted into the atmosphere, but also on the amount that is formed in the atmosphere by the photochemical reaction of other organic pollutants. How much ambient formaldehyde is photochemically produced has been estimated to be from

<sup>20</sup> "Assessment of Health Risks to Garment Workers and Certain Home Residents From Exposure to Formaldehyde," EPA Office of Pesticides and Toxic Substances, Final Draft, March 1987

about 60 to 90 percent of the total.<sup>21</sup> Hence, the formaldehyde that is directly emitted from methanol vehicles would not proportionately affect ambient concentrations. Limited modeling data, as discussed in the Summary and Analysis of Comments, bear this point out. Also, the overall reactivity of current vehicle emissions has been found to generally exceed that of methanol vehicle emissions, so it is probable that current vehicles result in more secondary formaldehyde.

*Summary.* At this time the Agency is not promulgating separate standards to specifically control emissions of formaldehyde to the ambient air. The foregoing analysis indicated that the methanol vehicles that will ultimately be marketed might emit methanol and formaldehyde at levels high enough to cause concern in public and private garages. The Agency has concluded, however, that the presently available emissions data for prototype vehicles and the models used in the garage scenarios are of uncertain value and that it does not have the legal authority to set standards to prevent such indoor exposures. With regard to formaldehyde's carcinogenic potential, sufficient data are not available to indicate that methanol vehicles will substantially impact ambient formaldehyde levels. EPA's analysis also revealed that formaldehyde emissions from petroleum fueled vehicles can be significant; therefore action to selectively address formaldehyde from methanol vehicles may not necessarily be appropriate. Sufficient time remains to address the outstanding uncertainties before methanol vehicles enter the fleet in significant quantities. EPA is committed to resolving these uncertainties. The Agency has already begun gathering data and performing the scientific studies that will be required in order to make regulatory decisions. As part of this effort, an Agency-wide task force has been created to assess issues related to ambient formaldehyde exposure and to recommend control options as appropriate. Other studies, noted elsewhere in this discussion, will also be carried out. If future evidence shows an unacceptable health risk, action consistent with EPA's statutory authority will be taken. Options that could be considered would include public education and warning labels on vehicles.

### *C. Standards for NOx, CO, Particulate, Smoke, and Crankcase Emissions*

*Review of the Proposal.* The Agency proposed that where numerically identical standards currently apply to petroleum vehicles regardless of engine type (*i.e.*, gasoline-fueled or diesel), the same standards should be adopted for the respective class of methanol vehicles. This was the case for the existing NOx standards and most of the CO standards (see Table 1).

Where the present emission standards differ by engine type (particulate, smoke, and heavy-duty vehicle CO), the Agency generally proposed that the respective control requirements should apply to methanol vehicles exhibiting emission characteristics similar to their petroleum counterparts. To determine the applicability of the standards, EPA found that methanol engine types could be best classified based on the method used to control the engine's power output (*i.e.*, the use or non-use of a throttle mechanism in the intake system to regulate the quantity of air allowed into the combustion chamber) as the primary indicator of engine cycle. More specifically, the emission characteristics of methanol engines that are throttled in normal operation were expected to be similar to those of throttled petroleum (*i.e.*, Otto-cycle, or gasoline-fueled) engines. Similarly, methanol engines not using a throttle during normal operation would be more like non-throttled petroleum (*i.e.*, diesel) engines. Using this approach, EPA proposed to apply the CO standards for gasoline-fueled and diesel heavy duty engines to their methanol-fueled counterparts, using the throttle criterion as the basis of classification. Also, the particulate and smoke standards which apply only to diesel vehicles were proposed for non-throttled (diesel) methanol vehicles.

There were two instances where this approach was not followed. First, the idle CO standards that are applicable to certain gasoline vehicles were proposed for *all* corresponding classes of methanol vehicles. The Agency expanded this requirement to include vehicles that otherwise would be classified as being non-throttled, primarily because one such prototype methanol engine utilized a throttling device during idle. This could result in fuel/air mixtures under idle conditions that were sufficiently rich to cause CO emissions in excess of the standards applicable to throttled methanol engines. Second, standards that presently prohibit crankcase emissions from all petroleum engines, except heavy-duty diesels using turbochargers or blowers for air induction (*i.e.*, non-

naturally aspirated engines), were proposed for *all* methanol engines. The Agency extended this requirement to non-naturally aspirated, non-throttled methanol engines because of the environmental concern over the nature of crankcase emissions and because there appeared to be no question of the feasibility of the requirement.

In the NPRM, EPA noted that while the proposed CO, NO<sub>x</sub>, particulate, and smoke standards currently appeared justified, there were significant uncertainties as to whether controls would ultimately prove necessary in every instance. (For example, most non-throttled engines should have little difficulty complying with the idle CO requirements.) The Agency proposed to deal with this possibility by providing for a waiver of the certification testing requirement for any manufacturer demonstrating that the applicable standard would never be exceeded during the vehicle's useful life. This is presently done with the CO standard for heavy-duty diesel engines in order to reduce the manufacturers' regulatory burden. A waiver of certification test requirements is not, however, to be construed as a waiver of liability to comply with the existing standard or to avoid end of line or in-use test requirements.

*Summary of the Comments.* Most of the comments on the proposed CO and NOx standards supported the proposed requirements. The only opposing comment came from MAN Nutzfahrzeuge GmbH (MAN) and pertained to the potential impact of the NOx standards for non-throttled methanol engines and methanol engines without turbochargers and intercoolers. MAN argued that the proposed standards (*e.g.*, 6.0 grams per brake horsepower-hour for 1990, 5.0 grams per brake horsepower-hour beginning in 1991) would adversely affect fuel economy and delay the acceptance of methanol engines.

Ford was the only commenter opposing the proposed approach for setting the idle CO standards. It stated that such standards were unnecessary for methanol vehicles not using a throttle at idle, and that such a requirement placed a burden on the manufacturer to either needlessly certify the vehicle or apply for a waiver.

Regarding the proposed particulate and smoke emission standards, Mercedes-Benz Truck Company disagreed with EPA's engine classification scheme for determining the applicability of the requirements. It argued that the presence of a throttle is irrelevant to a methanol engine's soot forming potential. The important

<sup>21</sup> "Source Assessment of Formaldehyde Emissions," Radian Corporation, September 3, 1985.

criterion was described as the kind of lubricating oil used by an engine during the combustion process. In this regard, the commenter suggested that EPA should focus on two-stroke engines, which use more oil than four-stroke engines, because both throttled and non-throttled versions of such engines may emit excessive particulate. No data were submitted to substantiate the commenter's claim, however.

GM's comments indicated that some form of catalytic exhaust aftertreatment may be required for heavy-duty engines burning neat (100 percent) methanol to comply with the most stringent particulate standards (0.10 grams per brake horsepower-hour beginning in 1991, for bus engines, and 1994 for all other HDMEs). GM was less certain about how vehicles operating on a methanol/gasoline mixture would perform but indicated that this fuel mixture could result in increased potential for particulate emissions.

The proposed control of crankcase emissions from non-naturally aspirated, non-throttled heavy-duty methanol engines drew negative comments from several parties. The commenters argued that crankcase controls are not currently required for petroleum-fueled non-naturally aspirated heavy-duty diesel engines, because their crankcase emissions are insignificant compared to the associated cost of control. As the primary support for this position, the manufacturers referred to two EPA analyses performed in the late 1970s and early 1980s that concluded such a requirement for these diesel engines was not cost effective. The commenters argued implicitly that the cost of controlling non-naturally aspirated, non-throttled methanol engines would be the same as that for their petroleum-fueled diesel counterparts because of similar emissions characteristics and requisite control technology. A turbocharged engine, for example, would require a pump to route the crankcase gas either into the exhaust in front of a catalyst, or into the intake manifold after the turbocharger. The manufacturers felt that these pumps would be prohibitively expensive, and that routing the gases directly into the turbocharger (which would not require a pump) would result in fouling due to oil mist, causing maintenance problems. The commenters presented no emissions or cost data for either petroleum- or methanol-fueled engines with which the previous studies could be updated or extended to methanol engines.

The few comments specifically addressing the proposed availability of waivers from the CO, NO<sub>x</sub>, particulate,

and smoke standards were positive. Caterpillar and the Engine Manufacturers Association (EMA) commented that smoke emissions should be very low from all methanol engines, so waivers from the testing requirements should be allowed for this pollutant. Ford's comment, noted in the discussion on idle CO standards, implied that this manufacturer was concerned that the waiver application process would be burdensome, but did not address the question of whether the availability of waivers would be a desirable regulatory outcome.

#### EPA Response to Comments

**NO<sub>x</sub> standards.** In response to MAN's comment that NO<sub>x</sub> standards for methanol vehicles should not necessarily be identical to those for petroleum vehicles, where they apply regardless of fuel type, EPA finds no reason to create special benefits for certain methanol vehicles by decreasing the stringency of the applicable NO<sub>x</sub> requirement. First, the goal of the rulemaking is to apply comparable emission control requirements to all vehicles. Second, the combustion temperatures associated with methanol fuel are less than those for petroleum fuels. These lower temperatures should inherently limit the NO<sub>x</sub> produced by methanol vehicles to lower concentrations than for their petroleum counterparts. As a result, the methanol-fueled diesel vehicles, as well as engines lacking turbochargers and intercoolers, cited by MAN should be able to comply with any NO<sub>x</sub> control requirements at least as easily as their petroleum counterparts. Therefore, EPA disagrees with MAN that methanol vehicles would be adversely affected by the promulgation of equivalent NO<sub>x</sub> standards.

**Idle CO.** The Ford comment questioning the need to implement idle CO standards for engines without a throttle has some merit. Nevertheless, in this instance, the Agency believes it is particularly important to recognize that methanol represents an emerging technology, and that there is no historical data base with which to accurately characterize the emissions performance of all methanol engine designs. In the absence of more definitive information, EPA continues to believe it is prudent to apply the standards as proposed, even for the case cited by the commenter. This approach also seems especially appropriate at this time, if manufacturers are allowed to apply for waivers of the certification testing requirements when a vehicle is expected to always emit below the level of the applicable standard.

In this regard, EPA disagrees with Ford's implication that the waiver application process represents a significant burden to the manufacturer. Applications for similar waivers are now easily and routinely processed for the diesel CO standard, and waiver requirements for methanol standards are not expected to be substantially different. The Agency also notes that other commenters supported the proposed waiver provision. Therefore, providing for a waiver of the testing requirements under the prescribed conditions appears to be a viable approach for dealing with the current uncertainties regarding the emission characteristics of some methanol vehicles, while at the same time reducing the manufacturers' regulatory burden where possible. The uncertainty about idle CO levels from potential methanol engine technologies along with the availability of testing waivers make it reasonable for EPA to promulgate the idle CO standard as proposed.

**Particulate and Smoke.** Regarding the proposed throttle-based classification scheme for determining the applicability of the particulate and smoke standards, the Agency agrees with Mercedes-Benz that the combustion of lubricating oil contributes to particulate formation. In the broadest sense, therefore, EPA's regulations ought to account for the particulate formation potential of two-stroke engines, which tend to consume larger quantities of lube oil regardless of whether or not they are throttled in nature. The Agency notes, however, that there is no apparent effort underway to develop or commercialize a two-stroke throttled methanol engine. Thus promulgation of standards applicable to such an engine would be premature at present.

Additionally, Mercedes-Benz's focus only on lubricating oil fails to acknowledge other primary determinants of particulate formation during the combustion process. Particulates are generally produced in localized fuel-rich areas of the combustion chamber. In diesel engines, power is controlled by varying the amount of fuel, while the volume of air inducted into the cylinder is essentially unaffected. Also, the fuel is usually sprayed directly into the combustion chamber. These characteristics of diesel engines can result in a heterogeneous fuel/air mixture within the cylinder due to droplet formation or charge stratification. The fuel rich areas of such a mixture often fail to burn completely, resulting in the formation of particulate matter. In Otto-cycle engines, power is controlled by metering both fuel and air.

This results in a fairly uniform fuel/air mixture in the cylinder. Such a mixture burns more completely and inherently produces relatively low particulate emissions. The Agency relied upon this fundamental distinction between the two types of engines in proposing the engine classification scheme for methanol vehicles.

Particulate nucleation is also thought to be dependent on the presence of hydrocarbon chains in the combustion mixture. Thus methanol combustion by itself ought to have little particulate formation potential. The presence of excess lube oil in the combustion chamber, as Mercedes-Benz points out, would increase that potential. GM correctly points out another potential source of hydrocarbon chains in the fuel by noting that gasoline may be used as a blendstock. Finally, EPA notes that other additives may also be present to provide desirable fuel combustion or safety-related properties. Thus the Agency continues to find that, in the absence of empirical data to the contrary, the lack of a throttle in diesel engines gives rise to combustion conditions that, combined with appropriate fuel or oil properties, may potentially result in excess particulate emissions. EPA continues to believe, therefore, that the throttle criterion, as a determinant of engine type and thus the applicability of smoke and particulate emissions standards, is reasonable and appropriate. At the same time, the Agency recognizes that this criterion may not in all cases be sufficient by itself to classify methanol engines as diesels. For example, some engines are throttled only under certain operating conditions, but may still emit significant quantities of particulate. Thus flexibility is being given to the Administrator in resolving any ambiguities, as described earlier, in engine classification.

The final comment on the proposed application of the particulate standards for heavy-duty methanol vehicles addressed the stringency of the requirement. GM indicated that catalytic exhaust aftertreatment could be needed to ensure compliance with at least the most stringent standard of 0.10 grams per mile for buses beginning in 1991 and for other heavy-duty vehicles beginning in 1994. The Agency does not view this as an issue in the feasibility of the standards. Catalytic converters similar to the type referred to by GM have been used on the vast majority of gasoline vehicles for many years, and the cost of this hardware is less than the particulate trap oxidizers that many petroleum-fueled heavy-duty diesels will require in the future to comply with the

standards. Testing by several manufacturers, GM included, indicates that the application of catalytic aftertreatment technology to methanol engines presents no technical difficulties beyond optimization of the catalytic ingredients and hardware layout. Therefore, EPA finds the particulate standards for heavy-duty methanol vehicles to be a reasonable emission control requirement.

*Crankcase Controls.* The last separate area of comment pertains to the prohibition against crankcase emissions from non-throttled heavy-duty methanol engines using turbochargers or blowers for air induction. The Agency finds the previous EPA analyses of diesel engines cited by the commenters are not applicable to methanol-fueled engines for two primary reasons. First, methanol-fueled diesel engines are expected to have lower particulate emissions than petroleum-fueled diesels. The resulting crankcase gases should therefore be cleaner and easier to filter, mitigating the concern with respect to turbocharger fouling. Because of these low levels of particulates, it may be more appropriate to compare crankcase emissions from methanol engines to crankcase emissions from gasoline-fueled engines, which have been routinely routed through turbochargers for years. Therefore, it is likely that control costs of non-naturally aspirated, methanol-fueled diesel engines would be more like those of turbocharged gasoline-fueled engines.

Second, the earlier analysis is outdated and represents a worst-case cost effectiveness for diesels. Since the time the analysis was done, two manufacturers (Daimler-Benz and Isuzu) have begun voluntarily controlling crankcase emissions from turbocharged diesel engines by routing the emissions through an oil separator and into the turbocharger. Actual control costs for the Daimler Benz engine are lower than EPA's previous estimate (see the Summary and Analysis of Comments for more detail). Admittedly, this cost information is for one engine model and may not be representative of costs for heavy-duty engines in general. However, it seems likely that current costs would on average be lower than those EPA estimated in the earlier analysis. Thus, even if the comparison between the emission characteristics of petroleum-fueled and methanol-fueled diesel engines were valid, the older heavy-duty diesel engine analysis would still not be applicable to methanol-fueled diesel engines. For these reasons, the Agency rejects the commenters' contention that controlling crankcase emissions from

non-naturally aspirated, non-throttled heavy-duty methanol engines is prohibitively expensive.

*Summary.* The Agency's review of the CO, NO<sub>x</sub>, particulate, and smoke exhaust emission standards shows that methanol vehicles should have no unique difficulty complying with the proposed requirements. In fact, compliance with the applicable NO<sub>x</sub> and particulate standards may be easier for methanol vehicles than for their petroleum counterparts. Regarding the availability of waivers to eliminate the testing requirements for vehicles with emissions that are always expected to remain below the applicable standard, EPA continues to find this a reasonable approach for reducing a manufacturer's regulatory burden without jeopardizing environmental protection. A review of the throttle-based classification scheme for determining the applicability of the particulate and smoke standards shows it is in general a reasonable method for differentiating between the types of methanol engines likely to exceed these standards if otherwise uncontrolled. Allowance for the consideration of other engine characteristics in addition to the use or non-use of a throttle will avoid ambiguities which may develop as a result of any hybrid engine technology. Finally, the prohibition against crankcase emissions from all methanol vehicles appears feasible and reasonable. Therefore, EPA concludes that the various standards should be promulgated as originally proposed.

#### *D. Emissions Averaging Programs*

*Review of the Proposal.* In the ANPRM, the Agency originally discussed allowing manufacturers to include methanol vehicles in their determination of compliance with the diesel particulate averaging standards. This consideration was predicated on the fact that the high efficiencies of methanol vehicles could result in their being in direct competition with petroleum-fueled diesel vehicles (*i.e.*, the sale of a methanol vehicle would preempt the purchase of its petroleum-fueled diesel equivalent). If this occurred, and manufacturers were allowed to count methanol vehicles toward compliance with the particulate standards, the inherently low particulate emissions from these vehicles would allow a diesel manufacturer to avoid the use of costly emission control technology, such as trap oxidizers, on some of its petroleum-fueled diesel vehicles. The result would be an incentive to develop methanol-technology with no detrimental effect on ambient particulate levels.

In the NPRM, however, the Agency noted that the degree to which methanol and petroleum-fueled diesel vehicles would be direct competitors was impossible to predict, due to the uncertainties associated with the relative economics of future methanol and petroleum vehicles. If methanol vehicles also competed with gasoline-fueled vehicles to any significant degree and averaging were allowed, diesel particulate emissions could increase substantially. For this reason, EPA did not propose to include methanol vehicles in determining compliance with the diesel particulate standards, but rather requested public comment on the possible design and desirability of such a program.

The Agency did propose creating for methanol vehicles separate particulate and NO<sub>x</sub> averaging programs that were comparable to those already in existence for various groups of gasoline-fueled and diesel vehicles. This regulatory approach gives a manufacturer added flexibility in designing its overall compliance strategy with the applicable standards. The proposal suggested prohibiting averaging between throttled and non-throttled methanol engines within the same group (*i.e.*, light-duty trucks). This latter provision is analogous to the separate gasoline-fueled and diesel averaging programs.

*Summary of the Comments.* Three manufacturers commented on allowing particulate averaging between fuel types. Caterpillar and Cummins generally criticized such a program from two perspectives. First, they agreed with EPA that it was impossible to predict the degree of future competition between methanol- and petroleum-fueled diesel vehicles. As noted above, this could substantially increase diesel particulate levels. Second, the manufacturers were concerned about the potential anti-competitive effects of such a program. Caterpillar argued that averaging between fuel types would at least initially provide an unfair advantage to manufacturers of smaller urban-oriented engines, because the demand for such engines would mirror the fact that during a transition to methanol, methanol should be more readily available in urban areas. Cummins argued that inter-fuel averaging would create adverse inequities for manufacturers who do not produce methanol engines, if a competitor's petroleum-fueled diesel engine could avoid more expensive control technology (*e.g.*, a trap oxidizer) as a consequence of producing methanol

vehicles for use in the averaging program.

Qualified support for the inter-fuel particulate averaging scheme came from GM. It felt that direct competition between methanol-fueled vehicles and petroleum-fueled diesel vehicles could be predicted to occur for urban bus sales. GM specifically suggested that averaging across fuel types for bus engines would allow areas without particulate problems to purchase less expensive, higher emitting, petroleum-fueled diesel buses, while areas with particulate problems could be required to purchase methanol buses or buses with trap oxidizers in order to receive operating subsidies from the Federal government. They also stated that because of the stringency of the 1991 urban bus standard, a substantial number of methanol buses would have to be produced to provide averaging credits sufficient to allow production of a single petroleum-fueled bus without a particulate trap.

No comments were received on the proposed particulate and NO<sub>x</sub> averaging programs for methanol vehicles only.

*EPA Response to Comments.* The position of both Caterpillar and Cummins that allowing averaging between the fuel types could somehow benefit manufacturers that produce methanol engines or small urban engines may be valid. However, it is not necessarily true that providing regulatory flexibility, which might be more advantageous for some manufacturers than others, would be anti-competitive. Further, the limited information supplied by the commenters failed to reasonably demonstrate whether any adverse, anti-competitive effects would actually occur.

The Agency continues to find the real issue pertaining to a combined averaging program concerns the potential effects on air quality. The Agency's preliminary analyses in this regard were narrow in scope and were unable to demonstrate that allowing averaging between methanol- and petroleum-fueled diesel vehicles could be environmentally benign. The analysis did not consider the alternative of only allowing methanol-fueled diesel engines to participate in averaging programs with diesels (and restricting the inclusion of methanol-fueled Otto-cycle engines). Since the NPRM was published, the Agency has reevaluated its approach to regulating all heavy-duty engines, including methanol-diesels. The Agency believes it may be possible to design an integrated program allowing cross-fuel averaging in some cases as well as some form of banking and

trading of emission credits among manufacturers. Such a program could have benefits for the regulated industry without undue adverse environmental impact, and therefore EPA has decided to pursue the issue through a regulatory action. Since this action is broader in scope than just the question of averaging between methanol-fueled and petroleum-fueled diesels, the present rulemaking is an inappropriate vehicle for further consideration of it. The Agency therefore defers analysis of comments received in this regard. GM's comments concerning the special case of buses are relevant to this broader program and will be considered as the future action is developed.

No substantive comments were received regarding the proposal to create separate particulate and NO<sub>x</sub> averaging programs similar to those already in existence for various groups of gasoline-fueled and diesel vehicles. The Agency views this as constituting acceptance of the goal of this rulemaking action, to create emission control requirements for methanol vehicles that are comparable to the requirements for their petroleum counterparts. Therefore, particulate and NO<sub>x</sub> averaging standards are being promulgated, including the prohibition of averaging emissions between Otto-cycle and diesel methanol engines, as well as other constraints identical to those for the current gasoline-fueled and diesel averaging programs.

#### *E. Fuel Economy Requirements*

*Summary of the Proposal.* The Energy Policy and Conservation Act authorizes the Department of Transportation (DOT), under 15 U.S.C. 2001(5), to determine that liquid or gaseous fuels other than gasoline and diesel oil should be included in the Corporate Average Fuel Economy (CAFE) and fuel economy labeling programs, if such inclusion would be consistent with the need of the nation to conserve energy. Similarly, Section 201 of the Energy Tax Act of 1978, 26 U.S.C. 4064 *et seq.*, authorizes the Secretary of the Treasury (after consultation with the Secretary of Transportation) to include in the Gas Guzzler Tax program vehicles fueled with any product of petroleum or natural gas, if such inclusion is consistent with the need of the nation to conserve energy. Since methanol is a liquid fuel and is currently produced mainly from natural gas, it could conceivably be included in the fuel economy programs established by either statute. Both of these statutes give EPA the responsibility for determining the amount of an alternative fuel which is

equivalent to a gallon of gasoline. The resulting gasoline-equivalent fuel economy of vehicles operating on alternative energy sources would then be used for the purposes of CAFE or the Gas Guzzler Tax, as appropriate.

In the NPRM, it was noted that neither DOT nor the Treasury had decided to include methanol in their respective programs. The Agency found that this made the establishment of a fuel equivalency factor (FEF) for methanol premature. Therefore, no such factor or associated labeling requirements were proposed.

*Summary of the Comments.* Several commenters expressed support for the inclusion of methanol in the CAFE and Gas Guzzler programs, stating that such action could speed the development of methanol vehicles. Most of these commenters also indicated a preference for one or another approach which could be used to determine the FEF. The California Air Resources Board stated that action by EPA would not create an incentive unless DOT and the Treasury also acted, but felt that no action by EPA would be a potential impediment to methanol development. Nissan felt that establishing an FEF now would promote research and development of methanol vehicles. Finally, the National Automobile Dealers Association encouraged EPA to pursue dialogue with DOT and the Treasury concerning methanol fuel equivalency.

*EPA Response to Comments.* The Agency agrees that it would be desirable for manufacturers to know exactly how methanol vehicles may ultimately be treated with respect to CAFE and the Gas Guzzler Tax. However, EPA believes that adopting an FEF for methanol at the present time would do little, if anything, to significantly reduce the present uncertainty, since DOT and the Treasury have not yet acted (and may not act) to include methanol in their respective programs. Also, it is not at all obvious that the establishment of this factor would by itself prompt a regulatory decision regarding the ultimate inclusion of methanol within the provisions of CAFE or the Gas Guzzler Tax. Moreover, if DOT or the Treasury decided to include methanol in their programs, their reasons for doing so may suggest that EPA should take a particular approach to establishing the FEFs. Lacking any real benefit to action, the Agency concludes that it is best to delay establishing an FEF for methanol. Therefore, the Agency has not addressed this issue in today's action. If and when methanol is included in the CAFE or Gas Guzzler programs, EPA

will initiate action to establish an FEF. In response to NADA's suggestion, EPA remains open to pursuing a dialogue with DOT and the Treasury on this topic, as appropriate.

#### F. Emission Test Procedures

##### 1. Test Fuel Specifications

*Review of the Proposal.* EPA proposed that methanol fuel used in emissions testing be representative of commercially available methanol fuel. This was necessary to ensure that test emissions would be representative of those associated with vehicle operation in the real world. Recognizing that methanol-fueled vehicles were at an early stage of development and that, as a result, manufacturers' fuel specifications for those vehicles that will ultimately be marketed have not been determined, EPA chose not to propose a detailed specification for methanol test fuel at the present time other than to require that the fuel contain at least 50 percent methanol by volume.

*Summary of the Comments.* Many commenters (California Air Resources Board, Chrysler, Department of Energy, Ford, Manufacturers of Emission Controls Association, Oxygenated Fuels Association, Nissan, and Toyota) stated that EPA should establish a fuel specification as part of the rulemaking. A fuel specification would provide vehicle and engine manufacturers with a basis for making engineering decisions on fuel system and engine design. Vehicle design parameters are dependent on fuel specification, and it was felt that a range of 50 percent through 100 percent methanol is too broad to allow this process to take place. Specifying a fuel would also provide fuel suppliers with a clear design target and prevent proliferation of fuel specifications.

Several commenters suggested that EPA should select either M85 (85 percent methanol/15 percent gasoline) or M100 (pure methanol) as the certification fuel. Reasons given in favor of M85 related to driveability, startability, flame luminosity, and fuel tank vapor concentration concerns. Also, this formulation is a common one specified for use in prototype research vehicles. M100 was suggested as an appropriate fuel for use in compression ignition engines.

Other commenters (GM, Chevron, Engine Manufacturers Association, and Volkswagen) felt that the manufacturers should specify the test fuel, at least in the short term, to ensure that only the fuel for which the vehicle is designed would be used. Volkswagen pointed out that flexibility in the choice of a test fuel

would facilitate research and continued development of the optimum vehicle and fuel combination. GM added that M85 and M100 are distinctly different fuels from the perspective of vehicle design and should not be viewed as different grades of methanol fuel.

The State of New York asked how, under EPA's proposals, a representative fuel would be chosen. More specifically, New York asked what fuel properties would be considered and what tolerances would be used to specify the fuel.

*EPA Response to Comments.* EPA concurs with those commenters who feel that it would be desirable to specify a fuel at the present time. Provision of a fuel specification now could force a degree of standardization within the vehicle and fuel industries which would be difficult to otherwise presently obtain. The Agency's primary concern in regard to a methanol test fuel, however, is to ensure that emission testing be representative of real world conditions. Since a methanol fuel market does not yet exist, it is not possible for the Agency to select a representative test fuel. Further, there would be problems associated with selection of a fuel specification before a market for methanol vehicles and fuel is established. The manufacturers would tend to optimize vehicles' emissions performance around the specified fuel. GM's comment that M85 and M100 are different fuels, not just different grades of methanol, is a useful one in this regard, and demonstrates how important the choice of a test fuel is. From emissions and performance perspectives, use of one of these fuels or the other can be expected to result in significantly different vehicle designs. Thus, an EPA specification provided now could have the effect of deterring vehicle optimization around a fuel which might be superior for technical, environmental, and/or economic reasons. Even if EPA were to proceed with establishing a test fuel at present, such action would not necessarily impact decisions made by fuel suppliers, who are not bound to market a fuel simply because EPA specifies it for purposes of environmental testing.

The desires of many of the commenters to have EPA specify one particular fuel or another notwithstanding, the development of the in-use fuel market should remain the concern of vehicle manufacturers and fuel suppliers. As long as vehicles are able to comply with emission standards when tested on the fuels that are eventually marketed, and as long as no other overriding environmental concern

not addressed by the emission standards accompanies use of those fuels, the Agency should remain neutral concerning the development of in-use fuels.

It is recognized that in the initial sales years of methanol vehicles, the fuel market may be more uncertain than after some degree of market equilibrium and vehicle and fuel standardization is reached. In this regard, those comments suggesting that EPA adopt the manufacturers' suggested test fuel are particularly useful. In the early phases of a transition to methanol, the manufacturers can be expected to have carefully considered the nature of the anticipated fuel market and incorporated their understanding of it into their vehicle design planning. The Agency in fact intends to take advantage of this knowledge by requiring that manufacturers recommend a test fuel for their certification vehicles and provide a justification as to why that fuel can be expected to be generally available and used in their vehicles. Final authority for specifying the fuel will, however, remain with the Administrator. In the longer run, as the fuel market solidifies, the Agency will be able to act to specify representative test fuels without this required input.

In response to New York's question regarding the details of any future specification, EPA will focus its consideration of potential test fuels on fuel properties that can be expected to affect emissions. Specifics in this regard will be provided at the time of the future action.

## 2. Emissions Measurement Procedures

*Review of the Proposal.* Only those aspects of the proposal receiving substantive comment are summarized here. Since most of the procedures proposed for methanol vehicle testing are identical to those already in use, comments received related mainly to procedures proposed to measure newly regulated pollutants. Organic emissions from methanol-fueled engines and vehicles consist primarily of a mixture of non-oxygenated hydrocarbons, methanol, and formaldehyde. EPA proposed requiring measurement of each of these organic materials. The Agency noted that a flame ionization detector (FID), the instrument presently used for measurement of petroleum-fueled vehicle hydrocarbons, can be used to correctly measure either hydrocarbon emissions or methanol emissions separately. It cannot, however, accurately measure both simultaneously, because it is less sensitive to methanol. EPA also noted in

the proposal that a FID has a very low (approaching zero) response to formaldehyde. As a result, more detailed procedures would be required to measure methanol vehicle organic emissions than petroleum-fueled vehicle HC.

Very briefly, the procedures proposed were as follows. For methanol, the procedure was to dissolve the methanol in water and to separate the methanol from the solvent using a gas chromatograph (GC) followed by heated FID measurement. For hydrocarbons, the procedure consisted of the collection of dilute bag samples, measurement of the hydrocarbons plus methanol with a heated FID calibrated on propane, followed by subtraction of the methanol fraction. The heated FID is required for this measurement due to its quicker response and its ability to prevent condensation in the sample lines. This analysis would need to account for the heated FID's response factor to methanol. For formaldehyde, the procedure employed the collection of formaldehyde from the exhaust sample by reaction with 2,4-dinitrophenylhydrazine (DNPH), either in impingers containing the reagent solution or in DNPH-impregnated silica gel cartridges. This would be followed by analysis with a high pressure liquid chromatograph and an ultraviolet detector.

EPA proposed that background samples of methanol and formaldehyde be collected for each phase (bag) of the test procedure, exactly as is required for other regulated pollutants. Analysis of these background samples would employ the same procedures as were described for the analyses of the exhaust emissions samples.

To prevent adsorption or condensation and the associated loss of exhaust gas constituents (in particular, methanol and formaldehyde), it was proposed that the duct connecting the vehicle tailpipe to the constant volume sampler and, in the case of heavy-duty methanol-fueled engines, the duct connecting the engine to the dilution tunnel, be heated to  $235 \pm 15$  °F ( $113 \pm 8$  °C).

*Summary of the Comments.* Several of the commenters felt that more cost effective procedures than those proposed for measuring organic emissions would be desirable. These commenters supported avoiding both the proposed methanol and formaldehyde measurement procedures by use of a FID to characterize total organics, even though, as was noted, this procedure would be less accurate than the proposed approach. One commenter,

EMA, suggested this approach be used at least on an interim basis until methanol vehicles achieve significant market penetration. Several manufacturers supported using the FID procedure currently used for petroleum-fueled vehicles, and applying correction factors to the results to account for the different response of the FID to methanol vehicle emissions. Others supported a similar option, with the difference being that the FID would be calibrated on methanol. GM further suggested that any correction factors also account for reactivity differences among the organics.

The Department of Energy (DOE) similarly supported the use of a FID calibrated on methanol, but did not support the use of correction factors. DOE felt that the HC overmeasurement accompanying such a procedure would provide a margin of safety with respect to ozone control.

Reasons given for suggesting these alternative procedures were: (1) They require less analytic equipment than the proposed procedures; (2) they would be less expensive than the proposed methods; and (3) they would allow continuous in-line measurement of the emissions, whereas the methanol and formaldehyde procedures, as proposed, would not.

GM suggested that an unheated FID be allowed for measurement of evaporative HC plus methanol emissions. GM felt that since there is not enough water vapor to cause condensation in the evaporative testing system, there is no need to heat the FID.

GM felt that some methanol loss may be associated with condensation on the walls of unheated sample bags employed in the exhaust HC plus methanol analysis, and that the use of a continuous heated FID analysis would give the correct results.

Toyota requested that the measurement of background formaldehyde levels be made optional because of inherently low background levels and the complexity of the analytical procedures.

Caterpillar and Toyota felt that the requirement that the exhaust ducting be heated was complicated and unnecessary. Toyota suggested a simplified approach that would allow the elimination of the heating requirement for short ducts or turning the heater off once the duct is preheated to EPA's specified temperature.

Finally, commenters raised questions regarding the use of other specific procedures which might produce equivalent results to those that would be

obtained if the proposed procedures were used.

*EPA Response to Comments.* Since one of EPA's goals in this rulemaking was to establish regulations that would ensure that methanol vehicles would not have any detrimental effect on air quality, the Agency is not willing to allow any simplified procedures which could potentially undermeasure total organic emissions. Based on an analysis presented in the Summary and Analysis of Comments, EPA concluded that only the simplification suggested by DOE could reasonably be expected to not undermeasure total organic emissions. EPA's data continue to show that the overmeasurement of HC that would result from this method would be greater than the undermeasurement of formaldehyde. Thus, the total would be conservatively high. Any attempt to correct this total via use of empirically derived coefficients, as several commenters requested, would risk sacrificing the margin of safety. Use of correction factors was therefore rejected by EPA. EPA has decided to allow use of the simplified procedure suggested by DOE, which provides an adequate margin of safety, on an interim basis.

Because the purpose of allowing the use of this simplified procedure would be to reduce testing costs and to provide manufacturers with more flexibility during the development of a methanol-fueled vehicle fleet, there needs to be a reasonable limit to the period of time wherein the simplified procedure can be used. It was decided that a five-year period from the effective date of these regulations would be sufficiently long to allow initial development of a methanol fleet.

EPA continues to believe that the long term requirement for the measurement of methanol and formaldehyde is necessary, because of the toxic and reactive nature of these pollutants. During the period when the use of the simplified measurement procedure is allowed, EPA expects to monitor the organic material composition of the emissions from methanol-fueled engines and vehicles. This monitoring would be performed to enhance the Agency's knowledge of methanol-fueled vehicle emissions and the potential for health effects. The Agency expects that manufacturers would collect similar data and make it available to EPA, as they have for other mobile source issues under the provisions of section 202(a)(4) of the Clean Air Act. The manufacturers currently provide much useful information under this section, and future information would logically

include test results for methanol and formaldehyde emissions.

Any manufacturer choosing the simplified method for a particular vehicle must understand that EPA will also use the method, and that all future testing of that vehicle for in-use compliance will also make use of it. This is to ensure that manufacturers do not make multiple attempts at compliance, first with the simplified (more conservative) method and perhaps later with the more accurate one. Also, requiring that in-use compliance testing make use of the same method of testing as was used during certification ensures consistency in the data.

Use of a heated FID is being required for evaporative as well as exhaust testing because of its quicker response to methanol as well as its ability to prevent condensation. Since the time available to draw a sample in evaporative testing is short, a quick FID response is essential for an accurate reading. Thus the Agency is promulgating this requirement as proposed.

The concern raised by GM about condensation-related losses in bags may be valid. However, lacking sufficient data with which to quantify the significance of GM's comment, the proposed sample collection procedure will be retained. This concern will be investigated in detail and, if warranted, the sample collection procedure will be modified at a future date. Manufacturers are forewarned that in the meantime, if good laboratory practice demands that steps be taken to avoid condensation in bags, they should take those steps as a matter of prudence.

Toyota is correct in stating that the background formaldehyde measurement could be simplified. However, it is not correct to suggest that measurement is not necessary at all. Such an approach could lead to problems in compliance determinations (vehicles could be failed inadvertently) and lab-to-lab correlation testing. As an option, however, EPA will allow collection of a single formaldehyde background sample for each test (instead of one sample for each phase), covering the total test period. This simplification will significantly reduce the labor and equipment demands of each test.

EPA finds that several simplifying options in regard to its requirement to heat the exhaust duct are also warranted. First, heating will not be required for ducts that are less than five feet long, and are constructed from smooth wall tubing. Second, when this configuration is impractical, EPA will allow the use of smooth wall ducts up to

12 feet long, as suggested by Toyota, without requiring heating during testing, provided that the duct is heated to  $235 \pm 15$  °F ( $113 \pm 8$  °C) prior to the start of testing and during any periods of the test when the engine is off. Heating of the duct will be required during the test, if the total length of the duct exceeds 12 feet. It should be noted that whenever the duct is heated, regardless of duct length, it will be necessary to ensure that the temperature of the duct wall does not exceed 250 °F (121 °C). As a final alternative, the exhaust duct may be essentially eliminated by moving the mixing point of the dilution air and exhaust gases to a point immediately adjacent to the vehicle tailpipe or engine exhaust.

Several commenters were concerned that EPA's proposed procedures might preclude their ability to utilize other measurement techniques that might produce equally accurate results. EPA stated in the NPRM that it wishes to encourage the continued development of measurement procedures for methanol vehicles. The promulgation of the procedures discussed above is not intended to prevent manufacturers from utilizing any other methods they consider to be superior, so long as they can demonstrate to EPA the methods' equivalency to the specified procedures.

### 3. Requirements for Flexible Fuel Vehicles

*Summary of the Proposal.* The Agency proposed that, because flexible fuel vehicles (FFVs) are designed to operate on gasoline, methanol, or any mixture of these fuels, they should comply with the emission standards (when tested using the methanol vehicle test procedures) when tested on any mixture of the fuels which they could conceivably consume in-use. Comments were specifically requested on the appropriateness of the requirement.

*Summary of the Comments.* No commenter argued against EPA's philosophy that FFVs should comply with the applicable emission standards when tested on fuels used in customer service. Most of the commenters were concerned, however, that EPA's proposed approach to certifying FFVs would require tests on a range of certification fuels and that this would be burdensome and unnecessarily complicated.

To avoid this, the commenters suggested a variety of alternatives, such as specifying either methanol or gasoline as the test fuel for each vehicle at the time of certification. Ford argued that testing on intermediate mixtures was unnecessary, because owners



would habitually use only one of the fuels. Chrysler felt that FFVs should be tested on *both* methanol and gasoline to ensure that the vehicles are not optimized for only one of the extremes. GM, however, suggested that testing initially should be required on gasoline only, since it will be the predominant fuel choice in the near future. Chevron pointed out that a methanol-gasoline mixture is often more volatile than either methanol or gasoline separately. Consequently, evaporative emissions will be greatest on a mixed fuel. It felt that this possibility should be addressed by testing on intermediate mixtures as well as methanol and gasoline. The Department of Energy felt that EPA should simply specify a worst case fuel mixture at the time of testing.

Finally, Ford was concerned about how FFVs would be treated with respect to fuel economy and labeling.

**EPA Response to Comments.** The statement that FFVs were expected to comply with standards using any possible in-use fuel was not meant to imply that testing would be required on a wide variety of different fuels. The Agency agrees with the commenters that this would create an unnecessary testing burden which could hinder the development of methanol vehicles. Rather, EPA believes that this goal can be achieved with a reasonable degree of confidence during the certification process by restricting certification tests to fuels that are most likely to produce high emissions. The importance of correctly identifying such fuels is underscored by Chrysler's comment that the emissions performance of a vehicle will likely be optimized for the certification test fuel.

In evaluating the alternatives suggested by the commenters, the Agency finds that testing on methanol or gasoline will not necessarily ensure worst-case emissions for certification purposes, nor would requiring separate tests with both fuels. As noted by Chevron, a mixture of methanol and gasoline can be significantly more volatile and result in higher emissions than either gasoline or methanol. EPA rejects Ford's contention that such mixtures are unlikely in customer service. There is no assurance that owners will habitually refuel with either methanol or gasoline. This would be especially true in a competitive fuel market, when consumers would be expected to exhibit the greatest interest in flexible fuel vehicles.

Overall the Agency is in at least partial agreement with the comments suggesting the designation of a single test fuel at the time of emissions certification. Two exceptions to this

general approach appear necessary, however, to ensure an effective program. First, to ensure environmental protection, separate fuels *may* be required for evaporative and exhaust testing and mileage accumulation. Second, the manufacturer should recommend a specification, for Administrator approval, of the test fuels most likely to produce the highest emissions. This is appropriate because the manufacturers generally will be most familiar with the specific emission characteristics of each vehicle. It also provides manufacturers with some degree of added certainty and flexibility concerning the certification requirements. These specifications would be made at the time of application for certification.

The Agency wants to stress that selection of a certification test fuel does not remove the manufacturer's liability for complying with the applicable standards when tested on other fuels. For example, EPA's in-use compliance testing of FFVs may be conducted using methanol, gasoline, or any mixture of these fuels found to be in customer service.

The issue of methanol's inclusion in the CAFE and Gas Guzzler programs is discussed in detail in a separate section. As is noted there, methanol is currently not a part of either program. Thus, the Agency finds that it is appropriate to treat FFVs strictly as gasoline vehicles for the purposes of CAFE and the Gas Guzzler Tax. This will necessitate testing on gasoline to determine the vehicle's fuel economy. With respect to labeling, since methanol is not included in the CAFE program and no methodology for calculating the fuel economy of methanol vehicles was proposed, placing a methanol fuel economy number on the label would be inappropriate.

#### IV. Technical Feasibility

In the NPRM, the Agency noted that the exhaust pollutants subject to control by the proposed standards are either similar or identical to those presently regulated from current vehicles and engines. Further, emission levels are such that the stringency of the new standards is comparable to that of existing standards for gasoline-fueled and diesel vehicles. This allows essentially the same emission control technology employed by petroleum vehicles to be applied to methanol vehicles. Numerous comments supported this point of view. Exhaust emission testing of prototype vehicles, along with a consideration of control technology that is emerging to address new standards applicable to petroleum-

fueled vehicles showed that the methanol vehicle exhaust standards are achievable with available or expected controls. In fact, most of the standards were achievable even before vehicles were optimized for methanol use (see Section III.B.1, for example).

Several comments were received which relate to the feasibility of the exhaust organics standards. Caterpillar claimed that carbon-based organics standards would not be achievable for its current heavy-duty engine. As discussed earlier in this document (see Section III. B.1, entitled "Basis of the Ozone-Related Standards"), the comment was insufficiently supported by data or by information on the emission-related goals of Caterpillar's engine program. Recent testing of another heavy-duty engine, this one by Detroit Diesel Allison (DDA), without a catalyst demonstrated that the CO, particulate, and NO<sub>x</sub> standards were readily achieved.<sup>22</sup> The organic emission standard was not met by this engine, but with the planned development of advanced fuel injectors or if necessary the addition of catalytic aftertreatment, compliance is now expected.

Ford presented data (also discussed in Section III.B.1) which showed that carbon-based standards were achievable, at least at the low to moderate mileage levels for which data were available. Ford's comments also indicated that little development work had been done to optimize the exhaust emission control systems of these vehicles. GM also presented data which demonstrated that exhaust organics are emitted from light-duty vehicles at levels below the standards. Thus the Agency is confident that the carbon-based standards are feasible for both heavy-duty and light-duty vehicles.

No commenter questioned the feasibility of compliance with any other exhaust emission standard (CO, NO<sub>x</sub>, particulate, or smoke). EPA concludes, therefore, that they are feasible.

EPA indicated in the NPRM that while some development effort may be required to achieve the evaporative standards, the control technology would be virtually identical to the current technology and thus should pose no significant technological challenges Ford agreed with the Agency and stated that the standards appeared feasible. No commenter argued that they were not. EPA concludes that the evaporative standards are feasible.

<sup>22</sup> Unpublished DDA test data. Available in the public docket for review.

Compliance with the prohibition against crankcase emissions is not expected to be difficult for any methanol vehicle. The requisite technology is currently used on all gasoline-fueled vehicles and on naturally aspirated diesels. Commenters did not argue that the standards for methanol engines would be infeasible. They did feel however that applying controls to non-naturally aspirated, methanol-fueled diesel engines would be prohibitively expensive, as is the case, they claimed, for non-naturally aspirated petroleum-fueled diesels today. Crankcase emissions from methanol-fueled engines, for reasons described elsewhere in this document (see Section III.C), should be easier to control than are diesel crankcase emissions. This fact, along with the voluntary application of crankcase controls on non-naturally aspirated heavy-duty petroleum-fueled diesels manufactured by Daimler-Benz and Isuzu, indicates that such technology is also feasible for non-naturally aspirated heavy-duty methanol engines.

#### V. Leadtime and the Effective Date of the Standards

The NPRM originally proposed an effective date of 1988 for these standards. Delays in the rulemaking process necessitated that this date be moved back. The earliest feasible date of applicability, as discussed below, is 1990. Hence the standards are effective as of that model year. The amount of leadtime now available is similar to that which would have been allowed had EPA maintained its original rulemaking schedule.

The only comment received in regard to the leadtime question was from EMA, which claimed that heavy-duty methanol engines should be allowed four years of leadtime for new HC, CO, and NO<sub>x</sub> standards. EMA's logic is faulty, however, since the statutory provision it refers to is in section 202(a)(3) of the Act. That section's specific requirement and legislative history make clear that Congress drafted the section with petroleum-fueled vehicles in mind. EPA thus believes that vehicles run on alternative fuels are appropriately regulated under sections 202(a)(1) and 202(a)(2), which, as noted in the NPRM, "shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." EPA notes that were the section EMA cites applicable, the Agency would not be required to provide specific leadtimes for all

standards (e.g., particulates), and it might in some cases have to set standards more stringent than those applicable to petroleum-fueled vehicles, if such standards were feasible for methanol-fueled vehicles on a technology-forcing basis. However, for reasons discussed earlier, EPA believes that methanol-fueled vehicle emission standards should be comparable to their petroleum-fueled vehicle counterparts, and that sections 202(a)(1) and (2) if the Act permitted this approach. The leadtime question therefore relates to technical considerations, not rigid statutory requirements.

From a technical perspective, leadtime is primarily a function of how rapidly manufacturers can respond in an orderly manner to the new emission control requirements. As discussed in greater detail earlier, the Agency fully expects all methanol vehicles to be able to comply with the proposed standards using the same basic technology now being applied to gasoline-fueled and diesel vehicles. Thus, the only leadtime necessary is that for the development of specific applications, procurement of componentry, and certification. (Leadtime for developing methanol emission testing procedures and facilities will be minimal, given their overall similarity to current test protocols and given the interim relaxation of some of the potentially more troublesome requirements of the emission measurement protocols.) This process can proceed as fast as the development of other, non-emissions related equipment specific to methanol-fueled vehicles, and could, in EPA's technical judgment, be completed as early as the 1991 model year, and perhaps in the case of a small number of engine families, as early as the 1990 model year.

Also important in choosing the effective date of the emission standards is when methanol vehicles will reach the market in significant numbers. The Agency believes that some methanol vehicles could be produced for public sale as early as 1990 and mass-produced in the early 1990's based on the present state of development. EPA recognizes that the most likely driving force for the introduction of methanol vehicles in the 1990 model year would be from states and municipalities seeking to improve their air quality. Under such a scenario, they may desire to purchase vehicles certified to comply with the standards promulgated here. To provide for this, the standards are established for the 1990 model year. However, to ensure that manufacturers have sufficient leadtime, compliance with the standards

will be optional for the 1990 model year, and mandatory for 1991 and later model years. Parties wishing to purchase vehicles meeting these standards in 1990 can do so simply by requiring it as a condition of purchase. EPA is confident that this approach will have no adverse impact on the environment, since the number of vehicles potentially involved is extremely small.

#### VI. Environmental Effects

Since methanol vehicles will displace petroleum-fueled vehicles, the environmental impact of today's standards will depend on a comparison of emissions from methanol-fueled vehicles to the emissions of petroleum-fueled vehicles. Making direct comparisons is, however, problematic. First, it is unknown which models of methanol vehicles will be marketed. Second, only limited testing has been done to compare emissions between similar petroleum-fueled and methanol-fueled vehicles.

In fact, the data which attempt to make such a comparison are inconclusive; sometimes emissions are less for methanol vehicles, sometimes not. The primary reason for this is that early methanol vehicle programs have been inconsistent with respect to emission control system design goals. The limited amount of development pursued to date, made apparent in comments by Ford (which has produced more methanol vehicles than any other company), makes a comparison for these models less relevant than if the vehicles had been optimized for methanol use.

The environmental impact of methanol vehicles can be estimated more precisely by examining some of the technological considerations of this rule than by trying to evaluate the limited and somewhat confounding data that are available

First, light-duty, methanol-fueled Otto-cycle vehicles are expected to utilize similar emission control technology to that used on existing gasoline-fueled vehicles (Section III.B.1). As a result, and given that the emission standards for CO and NO<sub>x</sub> will be identical to those applicable to gasoline-fueled vehicles, Otto-cycle methanol-fueled vehicles will have similar emission levels of these pollutants. Using similar logic, the emission standards for methanol-fueled vehicle organics are equivalent (on a carbon basis) to the HC standards for gasoline fueled vehicles, and thus roughly equivalent amounts of organic carbon emissions for methanol- and gasoline-fueled vehicles can be anticipated. It is important to note that

while the foregoing discussion compared organic emissions from methanol-fueled vehicles to HC emissions from gasoline-fueled vehicles, the relative abilities of those emissions to produce ozone may differ. EPA's analysis indicates that in general, when equal amounts of these two pollutant classifications (compared on a carbon basis) are emitted, the ozone produced from the methanol-fueled vehicle emissions will be somewhat less than that produced by the gasoline-fueled vehicle emissions. Thus, the standards being promulgated today should generally limit the amount of ozone produced by methanol-fueled vehicles relative to that resulting from gasoline-fueled vehicles. Most cities may experience a minor benefit in this regard, but no city is currently projected to suffer a degradation.

These conclusions were derived based on data for light-duty vehicles. Similar conclusions can be drawn as regards motorcycles and heavy-duty Otto-cycle engines (when compared to their gasoline-fueled counterparts), since control technologies will be similar to those applicable to light-duty vehicles.

Second, with respect to diesel vehicles, CO and organic carbon emissions would be expected to correspond roughly between methanol- and petroleum-fueled vehicles because of similar engine operation fundamentals and similar control requirements and technologies. The available information shows, however, that methanol offers substantial benefits in the areas of NO<sub>x</sub>, particulate, and smoke. This results not from any increased stringency of control requirements but rather by virtue of methanol's unique characteristics as a fuel when combusted in a diesel engine. Therefore, depending on the extent to which petroleum fueled diesel engines and vehicles are displaced by methanol-fueled engines and vehicles, the standards being promulgated today will have a positive environmental effect.

Thus, today's emission standards should, with exceptions as noted below, result in methanol vehicles having an equal or somewhat less adverse impact on the environment for regulated pollutants, depending on the vehicle type (Otto-cycle or diesel) and pollutant. The exceptions to this are methanol and formaldehyde. While emissions of these pollutants, as discussed below, will increase due to methanol vehicles, they are regulated under a combined carbon-based organics standard, and levels of organic carbon from methanol vehicles are not expected to increase.

There is some potential public health concern regarding the methanol and formaldehyde emissions from methanol

vehicles due to their acute toxic effects. As part of this rulemaking, the Agency assessed the public health risk associated with the toxicological properties of these pollutants by evaluating several public and private exposure scenarios. The results of this study suggest that the only area of potential near-term concern involves the idling of cold methanol vehicles in personal parking garages. Under this exposure scenario, the concentration of formaldehyde was estimated to be significantly greater than the level at which the vast majority of the population would first notice the irritant effects of this pollutant. Methanol concentrations were projected to exceed their levels of concern, but the available data do not allow a conclusion that adverse effects in humans would be anticipated at the predicted concentrations. (For a more detailed discussion of methanol health effects see the discussion labeled "Toxicity of Methanol," in Section III.B.2.)

It is noted that while these results are important, there are many uncertainties about the quality of the emission factor data and the validity of the exposure model used in the assessment. More importantly, the irritant effects of formaldehyde under such exposure conditions would likely discourage owners from idling methanol vehicles inside of their garages, particularly since such precautions would also prevent exposure to concentrations of carbon monoxide which could cause much more severe acute health effects (including nausea, severe headaches, brain damage, and even death). EPA believes that it is appropriate for the owner to assume responsibility for avoiding obviously adverse and voluntary exposures such as idling inside of a personal garage. In this regard, methanol-fueled vehicles are no different from petroleum-fueled vehicles, which have similar emissions of CO as methanol vehicles, and for which idling inside garages is recognized as a dangerous practice. Furthermore, current vehicles can also emit enough formaldehyde to cause formaldehyde concentrations inside a garage to significantly exceed the level of concern. EPA will continue to investigate the potential for unacceptable exposures in parking garages and other exposure settings as additional information becomes available. The Agency also notes the need for additional scientific study to determine the effects of repeated exposures to low levels of methanol, especially with regard to effects observed in well conducted animal studies as discussed earlier. Appropriate action, to the extent

statutorily authorized, will then be initiated if necessary. (Section III.B.3 contains a more detailed discussion of this topic.)

Formaldehyde is also a suspected human carcinogen. If methanol vehicles enter the market in significant numbers, typical ambient concentrations might increase, because these vehicles emit more formaldehyde than current vehicles. If so, any formaldehyde-related cancer risk could also increase. The uncertain extent to which formaldehyde is created in the atmosphere through photochemical reactions of other organic pollutants emitted from both stationary and mobile sources, however, provides a confounding effect in the analysis. This makes it difficult to judge the likely effect of methanol vehicles on ambient formaldehyde levels relative to that of other sources, including current vehicles. Given the present uncertainties and the fact that it will be a long time before methanol vehicles could comprise a large enough fraction of the fleet to significantly affect ambient formaldehyde concentrations, EPA intends to pursue its current study of formaldehyde-related emissions from all major sources before taking any regulatory action with regard to this pollutant. (Section III.B.3 contains a more detailed discussion of this topic.)

In a related matter, benzene and other carcinogens and toxic pollutants which result from direct emissions and incomplete combustion of current motor fuels are expected to exhibit a general decrease as methanol vehicle use increases.

Methanol vehicles could have an impact on global warming (i.e., the "greenhouse effect") as well. While increased combustion efficiency may result in lower carbon dioxide (CO<sub>2</sub>) emissions from methanol-fueled vehicles compared with petroleum-fueled vehicles, the overall impact of a shift to methanol-fueled vehicles on global warming is uncertain. The analysis of the impact must include the effect of not only emissions from the vehicles, but also emissions from methanol production. While CO<sub>2</sub> is the single largest contributor to the greenhouse effect, other greenhouse gases such as carbon monoxide, nitrous oxide and methane must also be considered. Additionally, if large scale methanol use were to result in significant decreases in tropospheric ozone concentrations on a global scale, a partial offset to the greenhouse warming would occur. Present modeling is, however, unable to estimate the degree to which replacement of gasoline by methanol in

motor vehicles would affect overall global tropospheric ozone levels.

The amounts of these greenhouse gases emitted vary depending upon how methanol is produced. Assuming energy prices that are roughly in the range of current prices and current technology, fuel for a methanol vehicle system would likely be derived from natural gas. In this case, a shift to methanol vehicles would have little or no effect upon global warming.

In the long-term, the implications of using methanol as a transportation fuel are difficult to predict. Should petroleum and natural gas prices rise substantially, it is probable that methanol would be produced from coal. Assuming vehicle miles traveled and other factors remain constant and assuming current process technology, a methanol-fueled system using methanol derived from coal could result in as much as a doubling of the motor vehicle contribution to the greenhouse effect relative to the contribution of current petroleum fuels. This increase, however, is not an inherent result of methanol production, rather it is a result of utilization of coal as a feedstock. Under some circumstances which make the use of coal as a motor fuel feedstock a viable economic alternative, the relevant comparison might not be between coal-based methanol and petroleum-based gasoline, but rather between coal-based methanol and coal-based gasoline. When economics encourages the production of motor fuel from coal, given current production processes and costs and methanol's potentially higher combustion efficiency, methanol production and use could have significant advantages over production and use of gasoline from coal. The overall range of global warming effects, however, would depend upon a wide range of factors, such as vehicle fuel economy and driving patterns, which would likely be different in a scenario in which production of transportation fuels from coal was economic. For example, total miles traveled and total fuel combusted would likely decrease due to conservation associated with higher prices. (This would likely occur equally for gasoline or methanol vehicles.) Therefore, the full impact on the greenhouse effect of a coal-derived methanol transportation system is difficult to accurately predict.

Finally, with higher petroleum prices it may become economically feasible to produce methanol from biomass. If this is done in a renewable fashion, there would be no net increase in carbon dioxide emissions. If the production process employed adequate control over

methane emissions, use of methanol from biomass could substantially reduce the transportation sector's contribution to global warming.

It is concluded that today's standards will result in levels of most regulated emissions similar to those for current vehicles they will displace. Exceptions include methanol and formaldehyde emissions which will increase, and smoke, particulate, and NO<sub>x</sub> emissions, which relative to current diesel engine levels will decrease. Also, replacement of petroleum-fueled vehicles with methanol-fueled-vehicles could result in decreases in ozone levels in some areas and will result in decreased emissions of unregulated toxins such as benzene and other fuel-related pollutants. Methanol vehicles could also have an effect on global warming, which could be positive or negative, depending on production processes. Overall, the environmental impact of methanol vehicles is expected to be positive.

#### VII. Economic Effects

The Agency expects the standards to be attainable using emission control technology which is similar to that already in existence for petroleum vehicles. Given this, as well as several other considerations to be discussed below, the cost of emission controls for methanol vehicles generally should be similar to or less than that for the majority of current vehicles.

In a few instances it appears possible that the application of present technology to methanol vehicles may be somewhat less costly. Most gasoline vehicles require a three-way (oxidation/reduction) catalyst to achieve the applicable standards. With several caveats, it is possible to conclude that the majority of Otto-cycle methanol vehicles will also utilize this type of control technology. First, research is presently being conducted to determine whether it may be possible to eliminate the reduction part of the catalyst without risking exceedance of the NO<sub>x</sub> standard. This would result in significant cost advantages. Methanol's lower combustion temperatures and resulting lower engine-out NO<sub>x</sub> emissions make this a possibility. Second, it is also possible that methanol's simple chemical structure will allow the use of less expensive oxidative materials in an optimized catalyst bed. Only Chrysler argued that the carbon-based exhaust organics standards would be more expensive than existing HC standards. Chrysler presented no data whatever with which to substantiate this claim. In light of this and in the absence of other similar

comments, the Agency rejects Chrysler's argument.

With regard to evaporative emissions, it is expected that carbon-containing canisters, identical in construction and function to those on gasoline fueled vehicles will be used as the control technology. It is expected that these canisters will be sized (and hence costed) similarly to those for gasoline-fueled vehicles or perhaps smaller, given methanol's lower volatility, and hence lower vapor generating capacity. No commenter argued that the evaporative standards would increase the cost of compliance for methanol-fueled vehicles when compared to gasoline-fueled vehicles.

With two notable exceptions, methanol-fueled diesel vehicles will likely require similar control technology to that used on current diesel vehicles. Many petroleum-fueled diesel vehicles will require a trap-oxidizer to achieve the stringent diesel particulate standards for urban buses and all heavy-duty vehicles beginning in the 1991 and 1994 model years, respectively. Some heavy-duty methanol-fueled diesel vehicles may require an oxidation catalyst in the worst case to attain the same standards. Oxidation catalysts are expected to be significantly less expensive than particulate trap-oxidizers. Therefore, compliance with the applicable particulate standards for methanol-fueled vehicles should be less costly than for petroleum-fueled vehicles. On the other hand, since evaporative standards do not now apply to petroleum-fueled diesel vehicles, their application to methanol-fueled diesel vehicles represents an increased cost. It is possible to reason, however, that this will be offset by the lower cost of complying with particulate standards for these vehicles.

Overall, methanol vehicles will have generally similar control technologies as current vehicles. With the exception that today's standards will require evaporative control on more vehicles than are controlled currently, every identified potential cost differential between methanol and current vehicles would work to make control for methanol vehicles less expensive relative to current vehicles. Overall, therefore, it is possible to conclude that the economic impact of these standards will be neutral or slightly favorable to methanol vehicles.

#### Statutory Authority:

The statutory authority for action is provided by sections 202(a) (1)-(2), 206, and 301(a) of the CAA (42 U.S.C. 7521(a), 7525, and 7601(a)).

**Administrative Designation**

Under Executive Order 12291, EPA must judge whether a regulation is "major" and, therefore, subject to the requirement that a Regulatory Impact Analysis be prepared. This regulation is being developed primarily to remove any emissions-related regulatory uncertainties that may act as a barrier to the development of methanol as a transportation fuel. It will not impose costs for methanol vehicles that are significantly different from those for vehicles which are already in production, and will not adversely affect competition, productivity, investment, employment, or innovation. This regulation, therefore, is not major and does not require a Regulatory Impact Analysis.

This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. Any written comments from OMB and any EPA response to those comments are in the public docket for this rulemaking.

**Reporting and Record Keeping Requirements**

The information collection requirements contained in this final rule have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980, 44 U.S.C. 2501 et seq., and have been assigned OMB Control Number 2060-0104. The public reporting burden for this collection of information is estimated to vary from 2 to 2000 hours per response, with an average of 115 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The burden for submissions pertaining to methanol-fueled vehicles will be slightly lower as a result of this action. The decrease, however is not significant on average.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection

Agency, 401 M Street, SW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC, 20503, marked "Attention Desk Officer for EPA."

**Impact on Small Entities**

Section 605 of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., requires that the Administrator certify that these regulations would not have a significant impact on a substantial number of small entities. I certify that this regulation does not have such an effect because it primarily affects only manufacturers of motor vehicles and motor vehicle engines, a group which does not contain a substantial number of small entities.

**List of Subjects in 40 CFR Part 86**

Administrative practice and procedures, Air pollution control, Gasoline, Motor vehicles, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

Date: February 22, 1989.

William K. Reilly,  
Administrator.

TABLE OF CHANGES MADE TO VARIOUS SUBPARTS

Section	Change	Reason
1. Part 86 Authority.....	Addition of citations .....	Incorporate all authority citations.
2. Table of Contents.....	Addition of 1990 MY sections .....	Incorporation of methanol fuel into the regulations.
3. § 86.090-1 .....	Addition of section 86.090-1 .....	Do.
4. § 86.090-2 .....	Addition of section 86.090-2 .....	Do.
5. § 86.090-3 .....	Addition of section 86.090-3 .....	Do.
6. § 86.090-5 .....	Addition of section 86.090-5 .....	Do.
7. § 86.090-8 .....	Addition of section 86.090-8 .....	Do.
8. § 86.090-9, (a)(1), (b), (d), (e) and (g)(2) .....	Modify language to include methanol.....	Do.
9. § 86.090-10, Title, (a)(1), (a)(3), (b) and (c).....	Change "gasoline-fueled" to "Otto-cycle" in title, and add emission standards for methanol fuel.	Do.
10. § 86.091-10, Title, (a)(1), (a)(3), (b) and (c).....	Change "gasoline-fueled" to "Otto-cycle" in title, add emission standards for methanol fuel.	Do.
11. § 86.090-11, (a)(1), (b)(1), (b)(3), (b)(4) and (c) .....	Add emission standards for methanol fuel .....	Do.
12. § 86.091-11, (a)(1), (b)(1), (b)(3), (b)(4) and (c) .....	Add emission standards for methanol fuel .....	Do.
13. § 86.094-11, (a)(1), (b)(1), (b)(3), (b)(4) and (c) .....	.....do.	Do.
14. § 86.090-14.....	Addition of section 86.090-14 .....	Do.
15. § 86.090-21.....	Addition of section 86.090-21 .....	Do.
16. § 86.091-21, (a), (b)(4)(ii), (b)(4)(iii)(B)(2), (b)(5)(i)(A), (b)(5)(i)(C), (b)(6)(i), (b)(6)(ii), (b)(6)(iii)(B)(3) and (e).	Modify language to incorporate methanol fuel.....	Do.
17. § 86.090-22.....	Addition of section 86.090-22 .....	Do.
18. § 86.090-23.....	Addition of section 86.090-23 .....	Do.
19. § 86.091-23, (b)(1)(ii), (b)(2), (b)(3), (b)(4), (c)(1), (e)(1), (f) and (f)(1).	Modify language to incorporate methanol fuel.....	Do.
20. § 86.090-24.....	Addition of section 86.090-24 .....	Do.
21. § 86.090-25, (b)(3), (d)(1)(ii), (e)(2), (3) and (h) .....	Modify language to include methanol.....	Do.
22. § 86.090-26.....	Addition of section 86.090-26 .....	Do.
23. § 86.090-27.....	Addition of section 86.090-27 .....	Do.
24. § 86.090-28.....	Addition of section 86.090-28 .....	Do.
25. § 86.091-28, (a)(4)(i), (a)(4)(i)(C), (a)(4)(ii)(B), (b)(2), (b)(3), (b)(4), (b)(8), (c)(2), (c)(4), (c)(7), (d)(1) and (d)(2).	Modify language to incorporate methanol fuel.....	Do.
26. § 86.090-29.....	Addition of section 86.090-29 .....	Do.
27. § 86.091-29, (a)(3)(i), (b)(3)(i) and (c)(1).....	Modify language to incorporate methanol fuel.....	Do.
28. § 86.090-30.....	Addition of section 86.090-30 .....	Do.
29. § 86.091-30, (a)(1)(ii), (a)(3)(i), (a)(3)(ii), (a)(9), (b)(1), (b)(3), (b)(4), (b)(4)(ii)(A), (b)(4)(iii), (b)(4)(iv) and (d).	Modify language to incorporate methanol fuel.....	Do.
30. § 86.090-35.....	Addition of Section 86.090-35 .....	Do.
31. § 86.091-35, (a), (a)(1)(iii)(C), (a)(1)(iii)(D), (a)(2)(iii)(D), (a)(3)(iii)(F), (a)(3)(iii)(G), (a)(3)(iii)(J), (a)(3)(iii)(K), (a)(4)(i), (a)(4)(iii)(E), (c)(1), (g)(1) and (h).	Modify language to incorporate methanol fuel.....	Do.
32. § 86.104, (b).....	Modify language to incorporate methanol fuel.....	Do.

## TABLE OF CHANGES MADE TO VARIOUS SUBPARTS—Continued

Section	Change	Reason
33. § 86.105, (a)	.....do.....	Do.
34. § 86.106-90	Addition of section 86.106-90	Do.
35. § 86.107-90	Addition of section 86.107-90	Do.
36. § 86.109-90	Addition of section 86.109-90	Do.
37. § 86.110-90	Addition of section 86.110-90	Do.
38. § 86.111-90	Addition of section 86.111-90	Do.
39. § 86.113-90	Modify language to incorporate methanol fuel	Do.
40. § 86.116-90	Addition of section 86.116-90	Do.
41. § 86.117-90	Addition of section 86.117-90	Do.
42. § 86.119-90	Addition of section 86.119-90	Do.
43. § 86.121-90	Addition of section 86.121-90	Do.
44. § 86.126-90	Addition of section 86.126-90	Do.
45. § 86.127-90	Addition of section 86.127-90	Do.
46. § 86.131-90	Addition of section 86.131-90	Do.
47. § 86.132-90	Addition of section 86.132-90	Do.
48. § 86.133-90	Addition of section 86.133-90	Do.
49. § 86.135-90	Addition of section 86.135-90	Do.
50. § 86.136-90	Addition of section 86.136-90	Do.
51. § 86.137-90	Addition of section 86.137-90	Do.
52. § 86.138-90	Addition of section 86.138-90	Do.
53. § 86.139-90	Addition of section 86.139-90	Do.
54. § 86.140-90	Addition of section 86.140-90	Do.
55. § 86.142-90	Addition of section 86.142-90	Do.
56. § 86.143-90	Addition of section 86.143-90	Do.
57. § 86.144-90	Addition of section 86.144-90	Do.
58. § 86.401-90	Addition of section 86.401-90	Do.
59. § 86.410-90	Addition of section 86.410-90	Do.
60. § 86.509-90	Addition of section 86.509-90	Do.
61. § 86.511-90	Addition of section 86.511-90	Do.
62. § 86.513-90, (c), (d), (e), (f), (g), (h)	Modify language to incorporate methanol fuel	Do.
63. § 86.516-90	Addition of section 86.516-90	Do.
64. § 86.519-90	Addition of section 86.519-90	Do.
65. § 86.521-90	Addition of section 86.521-90	Do.
66. § 86.526-90	Addition of section 86.526-90	Do.
67. § 86.527-90	Addition of section 86.527-90	Do.
68. § 86.535-90	Addition of section 86.535-90	Do.
69. § 86.537-90	Addition of section 86.537-90	Do.
70. § 86.540-90	Addition of section 86.540-90	Do.
71. § 86.542-90	Addition of section 86.542-90	Do.
72. § 86.544-90	Addition of section 86.544-90	Do.
73. § 86.608-90	Addition of section 86.608-90	Do.
74. Subpart I, Title	Change "Diesel-Fueled" to "Diesel" in title	Do.
75. § 86.884-1	Modify language to incorporate methanol fuel	Do.
76. § 86.884-5(b)	.....do.....	Do.
77. § 86.884-6	.....do.....	Do.
78. Subpart K, Title	Remove "Gasoline-Fueled" and "Diesel" from title	Do.
79. § 86.1001-84	Remove fuel types	Do.
80. § 86.1003-90	Addition of section 86.1003-90	Do.
81. § 86.1005-90	Addition of section 86.1005-90	Do.
82. § 86.1008-90	Addition of section 86.1008-90	Do.
83. Subpart M, Title	Add methanol fuel to title	Do.
84. § 86.1201-90	Addition of section 86.1201-90	Do.
85. § 86.1205-90	Addition of section 86.1205-90	Do.
86. § 86.1206-90	Addition of section 86.1206-90	Do.
87. § 86.1207-90	Addition of section 86.1207-90	Do.
88. § 86.1213-90(a), (c), (d), (e), (f)	Modify language to incorporate methanol fuel	Do.
89. § 86.1216-90	Addition of section 86.1216-90	Do.
90. § 86.1217-90	Addition of section 86.1217-90	Do.
91. § 86.1221-90	Addition of section 86.1221-90	Do.
92. § 86.1227-90	Addition of section 86.1227-90	Do.
93. § 86.1231-90	Addition of section 86.1231-90	Do.
94. § 86.1232-90	Addition of section 86.1232-90	Do.
95. § 86.1233-90	Addition of section 86.1233-90	Do.
96. § 86.1238-90	Addition of section 86.1238-90	Do.
97. § 86.1242-90	Addition of section 86.1242-90	Do.
98. § 86.1243-90	Addition of section 86.1243-90	Do.
99. Subpart N, Title	Change "Diesel-Fueled" to "Diesel" in Title	Do.
100. § 86.1301-90	Addition of section 86.1301-90	Do.
101. § 86.1304-90	Addition of section 86.1304-90	Do.
102. § 86.1305-90	Addition of section 86.1305-90	Do.
103. § 86.1306-90	Addition of section 86.1306-90	Do.
104. § 86.1309-90	Addition of section 86.1309-90	Do.
105. § 86.1310-90	Addition of section 86.1310-90	Do.
106. § 86.1311-90	Addition of section 86.1311-90	Do.
107. § 86.1313-90	Addition of section 86.1313-90	Do.
108. § 86.1316-90	Addition of section 86.1316-90	Do.
109. § 86.1319-90	Addition of section 86.1319-90	Do.
110. § 86.1320-90	Addition of section 86.1320-90	Do.
111. § 86.1321-90	Addition of section 86.1321-90	Do.
112. § 86.1326-90	Addition of section 86.1326-90	Do.

## TABLE OF CHANGES MADE TO VARIOUS SUBPARTS—Continued

Section	Change	Reason
113. § 86.1327-90	Addition of section 86.1327-90	Do.
114. § 86.1330-90	Addition of section 86.1330-90	Do.
115. § 86.1332-90	Addition of section 86.1332-90	Do.
116. § 86.1333-90	Addition of section 86.1333-90	Do.
117. § 86.1335-90	Addition of section 86.1335-90	Do.
118. § 86.1337-90	Addition of section 86.1337-90	Do.
119. § 86.1339-90	Addition of section 86.1339-90	Do.
120. § 86.1340-90	Addition of section 86.1340-90	Do.
121. § 86.1341-90	Addition of section 86.1341-90	Do.
122. § 86.1342-90	Addition of section 86.1342-90	Do.
123. § 86.1343-90, Title	Remove diesels only	Do.
124. § 86.1344-90	Addition of section 86.1344-90	Do.
125. Subpart P, Title	Addition of methanol fuel to title	Do.
126. § 86.1501-90	Addition of section 86.1501-90	Do.
127. § 86.1504-90	Addition of section 86.1504-90	Do.
128. § 86.1505-90	Addition of section 86.1505-90	Do.
129. § 86.1506-90	Addition of section 86.1506-90	Do.
130. Appendix I (f)(1) and (f)(3)	Change gasoline-fueled to Otto-cycle	Do.
131. § 86.091-2 Introductory text	Change 86.088-2 to 86.090-2	Continuation of 1990 definitions.
132. § 86.091-9 (a)(1), (b), (d)(e) and (g)(2)	Modify to include methanol	Do.

For the reasons set forth in the Preamble, Part 86 of Title 40 of the *Code of Federal Regulations* is revised, as set forth below:

1. The authority citation for Part 86 is revised to read as follows:

Authority: Secs. 202, 203, 206, 207, 208, 215, 301(a), of the Clean Air Act as Amended; 42 U.S.C. 7521, 7522, 7524, 7525, 7541, 7542, 7549, 7550 and 7601(a).

2. The Table of Contents of Part 86 is revised, to read as follows:

**PART 86—CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES AND NEW MOTOR VEHICLE ENGINES: CERTIFICATION AND TEST PROCEDURES**

**Subpart A—General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, Light-Duty Trucks, and Heavy-Duty Engines, and for 1985 and Later Model Year New Gasoline-Fueled and Methanol-Fueled Heavy-Duty Vehicles**

Sec.

- 86.078-3 Abbreviations.
- 86.078-6 Hearings on certification.
- 86.078-7 Maintenance of records; submittal of information; right of entry.
- 86.079-31 Separate certification.
- 86.079-32 Addition of a vehicle or engine after certification.
- 86.079-33 Changes to a vehicle or engine covered by certification.
- 86.079-36 Submission of vehicle identification numbers.
- 86.079-39 Submission of maintenance instructions.
- 86.080-12 Alternative certification procedures.
- 86.081-8 Emissions standards for 1981 light-duty vehicles.
- 86.082-2 Definitions.
- 86.082-8 Emission standards for 1982 and later light-duty vehicles.

Sec.

- 86.082-14 Small-volume manufacturer certification procedures.
- 86.082-34 Alternative procedure for notification of additions and changes.
- 86.083-30 Certification.
- 86.084-2 Definitions.
- 86.084-4 Section numbering; construction.
- 86.084-5 General standards; increase in emissions; unsafe conditions.
- 86.084-14 Small-volume manufacturers certification procedures.
- 86.084-15 Emission standards for 1984 model year heavy passenger cars.
- 86.084-26 Mileage and service accumulation; emission measurements.
- 86.084-40 Automatic expiration of reporting and recordkeeping requirements.
- 86.085-1 General applicability.
- 86.085-2 Definitions.
- 86.085-8 Emission standards for 1985 and later model year light-duty vehicles.
- 86.085-9 Emission standards for 1985 and later model year light-duty trucks.
- 86.085-10 Emission standards for 1985 and later model year gasoline-fueled heavy-duty engines and vehicles.
- 86.085-11 Emission standards for 1985 and later model year diesel heavy-duty engines.
- 86.085-13 Alternative durability program.
- 86.085-20 Incomplete vehicles, classification.
- 86.085-21 Application for certification.
- 86.085-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges.
- 86.085-23 Required data.
- 86.085-24 Test vehicles and engines.
- 86.085-25 Maintenance.
- 86.085-27 Special test procedures.
- 86.085-28 Compliance with emission standards.
- 86.085-29 Testing by the Administrator.
- 86.085-30 Certification.
- 86.085-35 Labeling.
- 86.085-37 Production vehicles and engines.

Sec.

- 86.085-38 Maintenance instructions.
- 86.087-8 Emission standards for 1987 light-duty vehicles.
- 86.087-9 Emission standards for 1987 and later model year light-duty trucks.
- 86.087-10 Emission standards for 1987 and later model year gasoline-fueled heavy-duty engines and vehicles.
- 86.087-21 Application for certification.
- 86.087-23 Required data.
- 86.087-25 Maintenance.
- 86.087-28 Compliance with emission standards.
- 86.087-29 Testing by the Administrator.
- 86.087-30 Certification.
- 86.087-35 Labeling.
- 86.087-38 Maintenance instructions.
- 86.088-2 Definitions.
- 86.088-9 Emission standards for 1988 and later model year light-duty trucks.
- 86.088-10 Emission standards for 1988 and later model year gasoline-fueled heavy-duty engines and vehicles.
- 86.088-11 Emission standards for 1988 and later model year diesel heavy-duty engines.
- 86.088-21 Application for certification.
- 86.088-23 Required data.
- 86.088-25 Maintenance.
- 86.088-28 Compliance with emission standards.
- 86.088-29 Testing by the Administrator.
- 86.088-30 Certification.
- 86.088-35 Labeling.
- 86.090-1 General applicability.
- 86.090-2 Definitions.
- 86.090-3 Abbreviations.
- 86.090-5 General standards; increase in emissions; unsafe conditions.
- 86.090-8 Emission standards for 1990 and later model year light-duty vehicles.
- 86.090-9 Emission standards for 1990 and later model year light-duty trucks.
- 86.090-10 Emission standards for 1990 and later model year Otto-cycle heavy-duty engines and vehicles.
- 86.090-11 Emission standards for 1990 and later model year diesel heavy-duty engines and vehicles.

- Sec.  
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3. A new § 86.090-1 is added to Subpart A to read as follows:

**§ 86.090-1 General applicability.**

(a) The provisions of this subpart apply to: 1990 and later model year new Otto-cycle and diesel light-duty vehicles; 1990 and later model year new

Otto-cycle and diesel light-duty trucks; and, 1990 and later model year new Otto-cycle and diesel heavy-duty engines.

(b) *Optional applicability.* A manufacturer may request to certify any heavy-duty vehicle of 10,000 pounds Gross Vehicle Weight Rating or less to the light-duty truck provisions. Heavy-duty engine or vehicle provisions do not apply to such a vehicle.

(c) [Reserved]

(d) *Alternative Durability Program.* For 1990 and later model year light-duty vehicles and light-duty trucks, a manufacturer may elect to participate in the Alternative Durability Program. This optional program provides an alternative method of determining exhaust emission control system durability. The general procedures and a description of the programs are contained in § 86.085-13 and specific provisions on test vehicles and compliance procedures are contained in § 86.085-24 and § 86.088-28 respectively.

(e) *Small-Volume Manufacturers.* Special certification procedures are available for any manufacturer whose projected combined U.S. sales of light-duty vehicles, light-duty trucks, and heavy-duty engines in its product line are fewer than 10,000 units for the model year in which the manufacturer seeks certification. In order to certify its product line under these optional procedures, the small-volume manufacturer must first obtain the Administrator's approval. Vehicles produced at facilities leased, operated, controlled, supervised, or is ten percent or greater part owned by the manufacturer shall be counted in calculating the total sales of the manufacturer. The small-volume manufacturer's certification procedures are described in § 86.090-14.

(f) *Optional Procedures for Determining Exhaust Opacity.* (1) The provisions of Subpart I apply to tests

which are performed by the Administrator, and optionally, by the manufacturer.

(2) Measurement procedures, other than that described in Subpart I, may be used by the manufacturer provided the manufacturer satisfies the requirements of § 86.090-23(f).

(3) When a manufacturer chooses to use an alternative measurement procedure it has the responsibility to determine whether the results obtained by the procedure will correlate with the results which would be obtained from the measurement procedure in Subpart I. Consequently, the Administrator will not routinely approve or disapprove any alternative opacity measurement procedure or any associated correlation data which the manufacturer elects to use to satisfy the data requirements of Subpart I.

(4) If a confirmatory test(s) is performed and the results indicate there is a systematic problem suggesting that the data generated under an optional alternative measurement procedure do not adequately correlate with Subpart I data, EPA may require that all certificates of conformity not already issued be based on data from Subpart I procedures.

4. A new § 86.090-2 is added to Subpart A to read as follows:

**§ 86.090-2 Definitions.**

The definitions in § 86.088-2 remain effective. The definitions in this section apply beginning with the 1990 model year.

"Composite particulate standard," for a manufacturer which elects to average light-duty vehicles and light-duty trucks together in either the petroleum-fueled or methanol-fueled light-duty particulate averaging program, means that standard calculated using the following equation and rounded to the nearest one-hundredth (0.01) of a gram per mile:

$$\frac{(\text{PROD}_{\text{LDV}})(\text{STD}_{\text{LDV}}) + (\text{PROD}_{\text{LDT}})(\text{STD}_{\text{LDT}})}{(\text{PROD}_{\text{LDV}}) + (\text{PROD}_{\text{LDT}})} = \text{Manufacturer composite particulate standard}$$

Where:

$\text{PROD}_{\text{LDV}}$  represents the manufacturer's total petroleum-fueled diesel or methanol-fueled diesel light-duty vehicle production for those engine families being included in the appropriate average for a given model year.

$\text{STD}_{\text{LDV}}$  represents the light-duty vehicle particulate standard.

$\text{PROD}_{\text{LDT}}$  represents the manufacturer's total petroleum-fueled diesel or methanol-fueled diesel light-duty truck production

for those engine families being included in the appropriate average for a given model year.

$\text{STD}_{\text{LDT}}$  represents the light-duty truck particulate standard.

"Diesel" means type of engine with operating characteristics significantly similar to the theoretical Diesel combustion cycle. The non-use of a throttle during normal operation is indicative of a diesel engine.

"Flexible fuel vehicle (or engine)" means any motor vehicle (or motor vehicle engine) engineered and designed to be operated on a petroleum fuel, a methanol fuel, or any mixtures of the two.

"Methanol-fueled" means any motor vehicle or motor vehicle engine that is engineered and designed to be operated using methanol fuel (*i.e.*, a fuel that

contains at least 50 percent methanol (CH<sub>3</sub>OH) by volume) as fuel. Flexible fuel vehicles are methanol-fueled vehicles.

"Non-oxygenated hydrocarbon" means organic emissions measured by a flame ionization detector excluding methanol.

"Organic Material Hydrocarbon Equivalent" means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, methanol and formaldehyde as contained in a gas sample, expressed as gasoline fueled vehicle hydrocarbons. In the case of exhaust emissions, the hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1. In the case of diurnal and hot soak emissions, the hydrogen-to-carbon ratios of the equivalent hydrocarbons are 2.33:1 and 2.2:1, respectively.

"Otto-cycle" means type of engine with operating characteristics significantly similar to the theoretical Otto combustion cycle. The use of a throttle during normal operation is indicative of an Otto-cycle engine.

"Primary intended service class" means:

(a) The primary service application group for which a heavy-duty diesel engine is designed and marketed, as determined by the manufacturer. The primary intended service classes are designated as light, medium, and heavy heavy-duty diesel engines. The determination is based on factors such as vehicle GVW, vehicle usage and operating patterns, other vehicle design characteristics, engine horsepower, and other engine design and operating characteristics.

(1) Light heavy-duty diesel engines usually are non-sleeved and not designed for rebuild; their rated horsepower generally ranges from 70 to 170. Vehicle body types in this group might include any heavy-duty vehicle built for a light-duty truck chassis, van trucks, multi-stop vans, recreational vehicles, and some single axle straight trucks. Typical applications would include personal transportation, light-load commercial hauling and delivery, passenger service, agriculture, and construction. The GVWR of these vehicles is normally less than 19,500 lbs.

(2) Medium heavy-duty diesel engines may be sleeved or non-sleeved and may be designed for rebuild. Rated horsepower generally ranges from 170 to 250. Vehicle body types in this group would typically include school buses, tandem axle straight trucks, city tractors, and a variety of special purpose vehicles such as small dump trucks, and trash compactor trucks. Typical applications would include

commercial short haul and intra-city delivery and pickup. Engines in this group are normally used in vehicles whose GVWR varies from 19,500–33,000 lbs.

(3) Heavy heavy-duty diesel engines are sleeved and designed for multiple rebuilds. Their rated horsepower generally exceeds 250. Vehicles in this group are normally tractors, trucks, and buses used in inter-city, long-haul applications. These vehicles normally exceed 33,000 lbs GVWR.

"Throttle" means a device used to control an engine's power output by limiting the amount of air entering the combustion chamber.

"Useful life" means:

(a) For light-duty vehicles a period of use of 5 years or 50,000 miles, whichever first occurs.

(b) For a light-duty truck engine family, a period of use of 11 years or 120,000 miles, whichever occurs first.

(c) For an Otto-cycle heavy-duty engine family, a period of use of 8 years or 110,000 miles, whichever first occurs.

(d) For a diesel heavy-duty engine family:

(1) For light heavy-duty diesel engines, period of use of 8 years or 110,000 miles, whichever first occurs.

(2) For medium heavy-duty diesel engines, a period of use of 8 years or 185,000 miles, whichever first occurs.

(3) For heavy heavy-duty diesel engines, a period of use of 8 years or 290,000 miles, whichever first occurs.

(e) As an option for both light-duty truck and heavy-duty engine families, an alternative useful life period assigned by the Administrator under the provisions of paragraph (f) of § 86.090–21.

(f) The useful-life period for purposes of the emissions defect warranty and emissions performance warranty shall be a period of 5 years/50,000 miles whichever first occurs, for light-duty trucks Otto-cycle heavy-duty engines and light heavy-duty diesel engines. For all other heavy-duty diesel engines the aforementioned period is 5 years/100,000 miles, whichever first occurs. However, in no case may this period be less than the manufacturer's basic mechanical warranty period for the engine family.

5. A new § 86.090–3 is added to Subpart A to read as follows:

**§ 86.090–3 Abbreviations.**

(a) The abbreviations in § 86.078–3 remain effective. The abbreviations in this section apply beginning with the 1990 model year.

(b) The abbreviations in this section apply to this subpart, and also to Subparts B, E, F, M, N, and P of this part, and have the following meanings:

DNPH—2,4-dinitrophenylhydrazine.

GC—Gas chromatograph.

HPLC—High-pressure liquid chromatography.

MeOH—Methanol (CH<sub>3</sub>OH).

OMHCE—Organic Material Hydrocarbon Equivalent.

UV—Ultraviolet.

6. A new § 86.090–5 is added to Subpart A to read as follows:

**§ 86.090–5 General standards; increase in emissions; unsafe conditions.**

(a)(1) Every new motor vehicle (or new motor vehicle engine) manufactured for sale, sold, offered for sale, introduced, or delivered for introduction to commerce, or imported into the United States for sale or resale which is subject to any of the standards prescribed in this subpart shall be covered by a certificate of conformity issued pursuant to §§ 86.090–21, 86.090–22, 86.090–23, 86.090–29, 86.090–30, 86.079–31, 86.079–32, 86.079–33, and 86.082–34.

(2) No heavy-duty vehicle manufacturer shall take any of the actions specified in section 203(a)(1) of the Act with respect to any Otto-cycle or diesel heavy-duty vehicle which uses an engine which has not been certified as meeting applicable standards.

(b)(1) Any system installed on or incorporated in a new motor vehicle (or new motor vehicle engine) to enable such vehicle (or engine) to conform to standards imposed by this subpart.

(i) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle (or engine) without such system, except as specifically permitted by regulation; and

(ii) Shall not in its operation, function or malfunction result in any unsafe condition endangering the motor vehicle its occupants, or persons or property in close proximity to the vehicle.

(2) In establishing the physically adjustable range of each adjustable parameter on a new motor vehicle (or new motor vehicle engine), the manufacturer shall ensure that, taking into consideration the production tolerances, safe vehicle driveability characteristics are available within that range, as required by section 202(a)(4) of the Clean Air Act.

(3) Every manufacturer of new motor vehicles (or new motor vehicle engines) subject to any of the standards imposed by this subpart shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicles (or motor vehicle engines) in accordance with good

engineering practice to ascertain that such test vehicles (or test engines) will meet the requirements of this section for the useful life of the vehicle (or engine).

7. A new § 86.090-8 is added to Subpart A to read as follows:

**§ 86.090-8 Emission standards for 1990 and later model year light-duty vehicles.**

(a)(1) Exhaust emissions from 1990 and later model year light-duty vehicles shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled vehicles):

(i)(A) *Hydrocarbons (for petroleum-fueled Otto-cycle and diesel vehicles)*. 0.41 gram per vehicle mile (0.26 gram per vehicle kilometer).

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel vehicles)*. 0.41 gram per vehicle mile (0.26 gram per vehicle kilometer).

(ii) *Carbon monoxide*. 3.4 grams per vehicle mile (2.1 grams per vehicle kilometer).

(iii) *Oxides of nitrogen*. 1.0 gram per vehicle mile (0.63 gram per vehicle kilometer).

(iv) *Particulate (for diesel vehicles only)*.

(A) 0.20 gram per vehicle mile (0.12 gram per vehicle kilometer).

(B) A manufacturer may elect to include all or some of its diesel light-duty vehicle engine families in the appropriate particulate averaging program (petroleum or methanol), provided that vehicles produced for sale in California or in designated high-altitude areas may be averaged only within each of these areas. Averaging is not permitted between fuel types. If the manufacturer elects to average light-duty vehicles and light-duty trucks together in the appropriate particulate averaging program, its composite particulate standard applies to the combined set of light-duty vehicles and light-duty trucks included in the average and is calculated as defined in § 86.090-2.

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B of this part and measured and calculated in accordance with those procedures.

(b) Fuel evaporative emissions from 1990 and later model year light-duty vehicles shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled engines):

(1) *Hydrocarbons (for gasoline-fueled vehicles)*. 2.0 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for methanol-fueled vehicles)*. 2.0 grams carbon per test.

(3) The standards set forth in paragraphs (b) (1) and (2) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1990 and later model year Otto-cycle or methanol-fueled diesel light-duty vehicle.

(d) through (f) [Reserved]

(g) Any 1990 and later model year light-duty vehicle that a manufacturer wishes to certify for sale shall meet the emission standards under both low- and high-altitude conditions as specified in § 86.082-2, except as provided in paragraphs (h) and (i) of this section. Vehicles shall meet emission standards under both low- and high-altitude conditions without manual adjustments or modifications. Any emission control device used to meet emission standards under high-altitude conditions shall initially actuate (automatically) no higher than 4,000 feet above sea level.

(h) The manufacturer may exempt 1990 and later model year vehicles from compliance at high altitude with the emission standards set forth in paragraphs (a) and (b) of this section if the vehicles are not intended for sale at high altitude and if the requirements of paragraphs (h) (1) and (2) of this section are met.

(1) A vehicle configuration shall only be considered eligible for exemption under paragraph (h) of this section if the requirements of either paragraph (h) (1) (i), (ii), (iii), or (iv) of this section are met.

(i) Its design parameters (displacement-to-weight ratio (D/W) and engine speed-to-vehicle-speed ratio (N/V)) fall within the exempted range for that manufacturer for that year. The exempted range is determined according to the following procedure:

(A) The manufacturer shall graphically display the D/W and N/V data of all vehicle configurations it will offer for the model year in question. The axis of the abscissa shall be D/W (where (D) is the engine displacement expressed in cubic centimeters and (W) is the equivalent vehicle test weight expressed in pounds), and the axis of the ordinate shall be N/V (where (N) is the crankshaft speed expressed in revolutions per minute and (V) is the vehicle speed expressed in miles per hour). At the manufacturer's option, either the 1:1 transmission gear ratio or the lowest numerical gear ratio available in the transmission will be used to determine N/V. The gear selection must be the same for all N/V

data points on the manufacturer's graph. For each transmission/axle ratio combination, only the lowest N/V value shall be used in the graphical display.

(B) The product line is then defined by the equation,  $N/V = C(D/W)^{-0.9}$ , where the constant, C, is determined by the requirement that all the vehicle data points either fall on the line or lie to the upper right of the line as displayed on the graphs.

(C) The exemption line is then defined by the equation,  $N/V = C(0.84 D/W)^{-0.9}$ , where the constant, C is the same as that found in paragraph (h)(1)(i)(B) of this section.

(D) The exempted range includes all values of N/V and D/W which simultaneously fall to the lower left of the exemption line as drawn on the graph.

(ii) Its design parameters fall within the alternate exempted range for that manufacturer that year. The alternate exempted range is determined by substituting rated horsepower (hp) for displacement (D) in the exemption procedure described in paragraph (h)(1)(i) of this section and by using the product line  $N/V = C(\text{hp}/W)^{-0.9}$ .

(A) Rated horsepower shall be determined by using the Society of Automotive Engineers Test Procedure J 1349, or any subsequent version of that test procedure. Any of the horsepower determinants within that test procedure may be used, as long as it is used consistently throughout the manufacturer's product line in any model year.

(B) No exemptions will be allowed under paragraph (h)(1)(ii) of this section to any manufacturer that has exempted vehicle configurations as set forth in paragraph (h)(1)(i) of this section.

(iii) Its acceleration time (the time it takes a vehicle to accelerate from 0 miles per hour to a speed not less than 40 miles per hour and not greater than 50 miles per hour) under high-altitude conditions is greater than the largest acceleration time under low-altitude conditions for that manufacturer for that year. The procedure to be followed in making this determination is:

(A) The manufacturer shall list the vehicle configuration and acceleration time under low-altitude conditions of that vehicle configuration which has the highest acceleration time under low-altitude conditions of all the vehicle configurations it will offer for the model year in question. The manufacturer shall also submit a description of the methodology used to make this determination.

(B) The manufacturer shall then list the vehicle configurations and

acceleration times under high-altitude conditions of all those vehicle configurations which have higher acceleration times under high-altitude conditions than the highest acceleration time at low altitude identified in paragraph (h)(1)(iii)(A) of this section.

(iv) In lieu of performing the test procedure of paragraphs (h)(1)(iii)(A) and (B) of this section, its acceleration time can be estimated based on the manufacturer's engineering evaluation, in accordance with good engineering practice, to meet the exemption criteria of paragraph (h)(1)(iii) of this section.

(2) A vehicle shall only be considered eligible for exemption under this paragraph if at least one configuration of its model type (and transmission configuration in the case of vehicles equipped with manual transmissions, excluding differences due to the presence of overdrive) is certified to meet emission standards under high-altitude conditions as specified in paragraph (a) through (g) of this section. The Certificate of Conformity (the Certificate) covering any exempted configuration(s) will also apply to the corresponding non-exempt configuration(s) required under this subparagraph. As a condition to the exemption, any suspension, revocation, voiding, or withdrawal of the Certificate as it applies to a non-exempt configuration for any reason will result in a suspension of the Certificate as it applies to the corresponding exempted configuration(s) of that model type, unless there is at least one other corresponding non-exempt configuration of the same model type still covered by the Certificate. The suspension of the Certificate as it applies to the exempted configuration(s) will be terminated when any one of the following occurs:

(i) Another corresponding non-exempt configuration(s) receive(s) coverage under the Certificate; or

(ii) Suspension of the Certificate as it applies to the corresponding non-exempt configuration(s) is terminated; or

(iii) The Agency's action(s), with respect to suspension, revocation, voiding or withdrawal of the Certificate as it applies to the corresponding non-exempt configuration(s), is reversed.

(3) The sale of a vehicle for principal use at a designated high-altitude location that has been exempted as set forth in paragraph (h) of this section will be considered a violation of Section 203(a)(1) of the Clean Air Act.

(i)(1) The manufacturers may exempt 1990 and later model year vehicles from compliance at low altitude with the emission standards set forth in paragraphs (a) and (b) of this section if the vehicles:

(i) Are not intended for sale at low altitude; and

(ii) Are equipped with a unique, high-altitude axle ratio (rear-wheel drive vehicles) or a unique, high-altitude drivetrain (front-wheel drive vehicles) with a higher N/V ratio than other configurations of that model type which are certified in compliance with the emission standards of paragraphs (a) and (b) of this section under low-altitude conditions.

(2) The sale of a vehicle for principal use at low altitude that has been exempted as set forth in paragraph (h)(1) of this section will be considered a violation of section 203(a)(1) of the Clean Air Act.

8. Section 86.090-9 of Subpart A is amended by revising paragraphs (a)(1), (b), (d), (e), and (g)(2), to read as follows:

**§ 86.090-9 Emission standards for 1990 and later model year light-duty trucks.**

(a)(1) The standards set forth in paragraphs (a) through (c) of this section shall apply to light-duty trucks sold for principal use at other than a designated high-altitude location. Exhaust emissions from 1990 and later model year light-duty trucks shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled vehicles):

(i)(A) *Hydrocarbons (for petroleum-fueled Otto-cycle and diesel light-duty trucks)*. 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel light-duty trucks)*. 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(ii) *Carbon monoxide*. (A) 10 grams per vehicle mile (6.2 grams per vehicle kilometer).

(B) 0.50 percent of exhaust gas flow at curb idle (for Otto-cycle and methanol-fueled diesel light-duty trucks only).

(iii) *Oxides of nitrogen*. (A) For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 1.2 grams per vehicle mile (0.75 gram per vehicle kilometer).

(B) For light-duty trucks greater loaded vehicle weight, 1.7 grams per vehicle mile (1.1 grams per vehicle kilometer).

(C) A manufacturer may elect to include all or some of its light-duty truck engine families in the NO<sub>x</sub> averaging program, provided that trucks produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas. Petroleum-fueled and methanol-fueled engine families may not be averaged together. Otto-cycle and diesel engines families also may not be averaged

together. If the manufacturer elects to participate in the NO<sub>x</sub> averaging program, individual family NO<sub>x</sub> emission limits may not exceed 2.3 grams per mile. If the manufacturer elects to average together NO<sub>x</sub> emissions of light-duty trucks subject to the standards of paragraphs (a)(1)(iii)(A) and (a)(1)(iii)(B) of this section, its composite NO<sub>x</sub> standard applies to the combined fleets of light-duty trucks up to and including, and over, 3,750 lbs loaded vehicle weight included in the average and is calculated as defined in § 86.088-2.

(iv) *Particulate (for diesel light-duty trucks only)*. (A) For light-duty trucks up to and including 3,750 lbs. loaded vehicle weight, 0.26 gram per vehicle mile (0.16 gram per vehicle kilometer).

(B) For light-duty trucks 3,751 lbs and greater loaded vehicle weight, 0.45 gram per vehicle mile (0.28 gram per vehicle kilometer).

(C) A manufacturer may elect to include all or some of its diesel light-duty truck engine families subject to the standard of paragraph (a)(1)(w)(A) of this section in the appropriate particulate averaging program (petroleum or methanol), provided that trucks produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas. Averaging is not permitted between fuel types. If the manufacturer elects to average both light-duty trucks subject to the standard of paragraph (a)(1)(w)(A) of this section and light-duty vehicles together in the appropriate particulate averaging program, its composite particulate standard applies to the combined set of light-duty vehicles and light-duty trucks included in the average and is calculated as defined in § 86.088-2.

\* \* \* \* \*

(b) Fuel evaporative emissions from 1990 and later model year light-duty trucks shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled vehicles):

(1) *Hydrocarbons (for gasoline-fueled light-duty trucks)*. 2.0 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for methanol-fueled light-duty trucks)*. 2.0 grams per test.

(3) The standards set forth in paragraphs (b) (1) and (2) of this section refer to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

\* \* \* \* \*

(d)(1) Model year 1990 and later light-duty trucks sold for principal use at a

designated high-altitude location shall be capable of meeting the following exhaust emission standards when tested under high-altitude conditions:

(i)(A) *Hydrocarbons (for petroleum-fueled Otto-cycle and diesel light-duty trucks)*. 1.0 grams per vehicle mile (0.62 grams per vehicle kilometer).

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel light-duty trucks)*. 1.0 gram per vehicle mile (0.62 gram per vehicle kilometer).

(ii) *Carbon Monoxide*. (A) 14 grams per vehicle mile (8.7 grams per vehicle kilometer).

(B) 0.50 percent of exhaust gas flow at curb idle (for Otto-cycle and methanol-fueled diesel light-duty trucks only).

(iii) *Oxides of Nitrogen*. (A) For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 1.2 grams per vehicle mile (0.75 grams per vehicle kilometer).

(B) For light-duty trucks 3,751 lbs and greater loaded vehicle weight, 1.7 grams per vehicle mile (1.1 grams per vehicle kilometer).

(iv) *Particulate (for diesel light-duty trucks only)*. For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 0.26 gram per vehicle mile (0.16 gram per vehicle kilometer).

(2) The standards set forth in paragraph (d)(1)(i), (d)(1)(ii)(A), (d)(1)(iii), and (d)(1)(iv) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B of this part and measured and calculated in accordance with those procedures. The standard set forth in paragraph (d)(1)(ii)(B) of this section refers to the exhaust emitted at curb idle and measured and calculated in accordance with the procedures set forth in Subpart P of this part.

(e) Fuel evaporative emissions from 1990 and later model year light-duty trucks sold for principal use at a designated high-altitude location, when tested under high-altitude conditions, shall not exceed:

(1) *Hydrocarbons (for gasoline-fueled light-duty trucks)*. 2.6 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for methanol-fueled light-duty trucks)*. 2.6 grams per test.

(3) The standards set forth in paragraphs (e) (1) and (2) of this section refer to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

\* \* \* \* \*

(g) \* \* \*  
(2) The manufacturer may exempt 1990 and later model year vehicles from

compliance with the high-altitude emission standards set forth in paragraphs (d) and (e) of this section if the vehicles are not intended for sale at high altitude and if the following requirements are met. A vehicle configuration shall only be considered eligible for exemption if the requirements of either paragraph (g)(2) (i), (ii), (iii), or (iv) of this section are met.

\* \* \* \* \*

9. Section 86.090-10 of Subpart A is amended by revising the title and paragraphs (a)(1), (a)(3), (b) and (c), to read as follows:

**§ 86.090-10 Emission standards for 1990 and later model year Otto-cycle heavy-duty engines and vehicles.**

(a)(1) Exhaust emissions from new 1990 and later model year Otto-cycle engines shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled engines):

(i) For *gasoline-fueled Otto-cycle engines* intended for use in all vehicles except as provided in paragraph (a)(3) of this paragraph,

(A) *Hydrocarbons*. 1.1 grams per brake horsepower-hour (0.41 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide*. (1) 14.4 grams per brake horsepower-hour (5.36 grams per megajoule), as measured under transient operating conditions.

(2) For *gasoline-fueled Otto-cycle heavy-duty engines utilizing aftertreatment technology*. 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen*. 6.0 grams per brake horsepower-hour (2.2 grams per megajoule), as measured under transient operating conditions.

(ii) For *gasoline-fueled Otto-cycle engines* intended for use only in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs,

(A) *Hydrocarbons*. 1.9 grams per brake horsepower-hour (0.71 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon Monoxide*. (1) 37.1 grams per brake horsepower-hour (13.8 grams per megajoule), as measured under transient operating conditions.

(2) For *gasoline-fueled Otto-cycle heavy-duty engines utilizing aftertreatment technology*. 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen*. 6.0 grams per brake horsepower-hour (2.2 grams per megajoule), as measured under transient operating conditions.

(iii) For *methanol-fueled Otto-cycle heavy-duty engines* intended for use in all vehicles, except as provided in paragraph (a)(3) of this paragraph.

(A) *Organic Material Hydrocarbon Equivalent*. 1.1 gram per brake horsepower-hour (0.41 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide*. (1) 14.4 grams per brake horsepower-hour (5.36 grams per megajoule), as measured under transient operating conditions.

(2) 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen*. 6.0 grams per brake horsepower-hour (2.2 grams per megajoule), as measured under transient operating conditions.

(iv) For *methanol-fueled Otto-cycle heavy-duty engines* intended for use only in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs.

(A) *Organic Material Hydrocarbon Equivalent*. 1.9 grams per brake horsepower-hour (0.71 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide*. (1) 37.1 grams per brake horsepower-hour (13.8 grams per megajoule), as measured under transient operating conditions.

(2) 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen*. 6.0 grams per brake horsepower-hour (2.2 grams per megajoule), as measured under transient operating conditions.

\* \* \* \* \*

(3)(i) A manufacturer may certify one or more gasoline-fueled Otto-cycle heavy-duty engine configurations intended for use in all vehicles to the emission standards set forth in paragraph (a)(1)(ii) of this section: *Provided*, that the total model year sales of such configuration(s) being certified to the emission standards in paragraph (a)(1)(ii) of this section represent no more than 5 percent of total model year sales of all gasoline-fueled Otto-cycle heavy-duty engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

(ii) A manufacturer may certify one or more methanol-fueled Otto-cycle heavy-duty engine configurations intended for use in all vehicles to the emission standards set forth in paragraph (a)(1)(iv) of this section: *Provided*, that the total model year sales of such configuration(s) being certified to the emission standards in paragraph (a)(1)(iv) of this section represent no more than 5 percent of total model year sales of all methanol-fueled Otto-cycle heavy-duty engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

(iii) The configurations certified to the emission standards of paragraphs (a)(1)(ii) and (iv) of this section under the provisions of paragraphs (a)(3)(i) and (ii) of this section shall still be required to meet the evaporative emission standards set forth in paragraphs (b)(1)(i) (b)(2)(i) and (b)(3)(i) of this section.

(b) *Evaporative emissions* from 1990 and later model year heavy-duty vehicles shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled engines):

(1) *Hydrocarbons (for vehicles equipped with gasoline-fueled engines).*

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs, 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs, 4.0 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for vehicles equipped with methanol-fueled engines).* (i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs, 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs, 4.0 grams per test.

(3)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs, the standards set forth in paragraphs (b)(1) and (b)(2) of this section refer to a composite sample of evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs, the standards set forth in paragraphs (b)(1)(ii) and (b)(2)(ii) of this section refer to the manufacturer's engineering design evaluation using good engineering practice (a statement of which is required in § 86.090-23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1990 or later model year Otto-cycle heavy-duty engine.

\* \* \* \* \*

10. Section 86.091-10 of Subpart A is amended by revising the title of the section and paragraphs (a)(1), (a)(3), (b), and (c), to read as follows:

**§ 86.091-10 Emission standards for 1991 and later model year Otto-cycle heavy-duty engines and vehicles.**

(a)(1) Exhaust emissions from new 1991 and later model year Otto-cycle heavy-duty engines shall not exceed:

(i) For *gasoline-fueled Otto-cycle engines* intended for use in all vehicles except as provided in paragraph (a)(3) of this paragraph,

(A) *Hydrocarbons.* 1.1 grams per brake horsepower-hour (0.41 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide.* (1) 14.4 grams per brake horsepower-hour (5.36 grams per megajoule), as measured under transient operating conditions.

(2) For *gasoline-fueled Otto-cycle heavy-duty engines utilizing aftertreatment technology.* 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen.* (1) 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(2) A manufacturer may elect to include some or all of its gasoline-fueled Otto-cycle heavy-duty engine families in the heavy-duty engine NO<sub>x</sub> averaging program, provided that engines produced for sale in California or in 49-state areas may be averaged only within each of those areas. Averaging is limited to within fuel types (gasoline and methanol). If the manufacturer elects to participate in the NO<sub>x</sub> averaging program, individual family NO<sub>x</sub> emission limits may not exceed 6.0 grams per brake horsepower-hour (2.2 grams per megajoule).

(ii) For *gasoline-fueled Otto-cycle engines* intended for use only in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs.

(A) *Hydrocarbons.* 1.9 grams per brake horsepower-hour (0.71 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon Monoxide.* (1) 37.1 grams per brake horsepower-hour (13.8 grams per megajoule), as measured under transient operating conditions.

(2) For *gasoline-fueled Otto-cycle heavy-duty engines utilizing aftertreatment technology.* 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen.* (1) 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(2) A manufacturer may elect to include some or all of its gasoline-fueled Otto-cycle heavy-duty engine families in the heavy-duty engine NO<sub>x</sub> averaging program, as described in paragraph (a)(1)(i)(C)(2) of this section.

(iii) For *methanol-fueled Otto-cycle heavy-duty engines* intended for use in all vehicles, except as provided in paragraph (a)(3) of this section.

(A) *Organic Material Hydrocarbon Equivalent.* 1.1 gram per brake horsepower-hour (0.41 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide.* (1) 14.4 grams per brake horsepower-hour (5.36 grams

per megajoule), as measured under transient operating conditions.

(2) 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen.* (1) 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(2) A manufacturer may elect to include some or all of its methanol-fueled Otto-cycle engine families in the heavy-duty NO<sub>x</sub> averaging program, as described in paragraph (a)(1)(i)(C)(2) of this section.

(iv) For *methanol-fueled Otto-cycle heavy-duty engines* intended for use only in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs.

(A) *Organic Material Hydrocarbon Equivalent.* 1.9 grams per brake horsepower-hour (0.71 gram per megajoule), as measured under transient operating conditions.

(B) *Carbon monoxide.* (1) 37.1 grams per brake horsepower-hour (13.8 grams per megajoule), as measured under transient operating conditions.

(2) 0.50 percent of exhaust gas flow at curb idle.

(C) *Oxides of nitrogen.* (1) 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(2) A manufacturer may elect to include some or all of its methanol-fueled Otto-cycle heavy-duty engine families in the heavy-duty NO<sub>x</sub> averaging program, as described in paragraph (a)(1)(i)(C)(2) of this section.

(2) \* \* \*

(3)(i) A manufacturer may certify one or more gasoline-fueled Otto-cycle heavy-duty engine configurations intended for use in all vehicles to the emission standards set forth in paragraph (a)(1)(ii) of this section: *Provided*, that the total model year sales of such configuration(s) being certified to the emission standards in paragraph (a)(1)(ii) of this section represent no more than 5 percent of total model year sales of all gasoline-fueled Otto-cycle heavy-duty engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

(ii) A manufacturer may certify one or more methanol-fueled Otto-cycle heavy-duty engine configurations intended for use in all vehicles to the emission standards set forth in paragraph (a)(1)(iv) of this section: *Provided*, that the total model year sales of such configuration(s) being certified to the emission standards in paragraph (a)(1)(iv) of this section represent no more than 5 percent of total model year sales of all methanol-fueled Otto-cycle heavy-duty



engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

(iii) The configurations certified to the emission standards of paragraphs (a)(1) (ii) and (iv) of this section under the provisions of paragraphs (a)(3) (i) and (ii) of this section shall still be required to meet the evaporative emission standards set forth in paragraphs (b)(1)(i), (b)(2)(i) and (b)(3)(i) of this section.

(b) *Evaporative emissions from 1991 and later model year heavy-duty vehicles shall not exceed:*

(1) *Hydrocarbons (for vehicles equipped with gasoline-fueled engines).*

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs., 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs., 4.0 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for vehicles equipped with methanol-fueled engines).*

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs., 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs., 4.0 grams per test.

(3)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs., the standards set forth in paragraphs (b)(1) and (b)(2) of this section refer to a composite sample of evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs., the standards set forth in paragraphs (b)(1)(ii) and (b)(2)(ii) of this section refer to the manufacturer's engineering design evaluation using good engineering practice (a statement of which is required in § 86.091-23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1991 or later model year Otto-cycle heavy-duty engine.

11. Section 86.090-11 of Subpart A is amended by revising paragraphs (a)(1) and (c) and adding new paragraphs (b)(3) and (b)(4), to read as follows:

§ 86.090-11 *Emission standards for 1990 and later model year diesel heavy-duty engines and vehicles.*

(a)(1) Exhaust emissions from new 1990 and later model year diesel heavy-duty engines shall not exceed the following:

(i)(A) *Hydrocarbons (for petroleum-fueled diesel engines).* 1.3 grams per

brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled diesel engines).* 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(ii) *Carbon monoxide.* (A) 15.5 grams per brake horsepower-hour (5.77 grams per megajoule), as measured under transient operating conditions.

(B) 0.50 percent of exhaust gas flow at curb idle (methanol-fueled diesel only).

(iii) *Oxides of nitrogen.* 6.0 grams per brake horsepower-hour (2.2 grams per megajoule), as measured under transient operating conditions.

(iv) *Particulate.* For diesel engines, 0.60 gram per brake horsepower-hour (0.22 gram per megajoule), as measured under transient operating conditions.

(b) \* \* \*

(3) *Evaporative emissions (total of non-oxygenated hydrocarbons plus methanol) from 1990 and later model year heavy-duty vehicles equipped with methanol-fueled diesel engines shall not exceed:*

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs., 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs., 4.0 grams per test.

(4)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs., the standards set forth in paragraph (b)(3) of this section refer to a composite sample of evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs., the standard set forth in paragraph (b)(3)(ii) of this section refers to the manufacturers' engineering design evaluation using good engineering practice (a statement of which is required in § 86.090-23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1990 or later model year methanol-fueled diesel, or any naturally-aspirated diesel heavy-duty engine. For petroleum-fueled diesel engines only, this provision does not apply to engines using turbochargers, pumps, blowers, or superchargers for air induction.

12. Section 86.091-11 of Subpart A is amended by revising paragraphs (a)(1) and (c), and adding new paragraphs (b)(3) and (b)(4), to read as follows:

§ 86.091-11 *Emission standards for 1991 and later model year diesel heavy-duty engines and vehicles.*

(a)(1) Exhaust emissions from new 1991 and later model year diesel heavy-duty engines shall not exceed the following:

(i)(A) *Hydrocarbons (for petroleum-fueled diesel engines).* 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled diesel engines).* 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(ii) *Carbon monoxide.* (A) 15.5 grams per brake horsepower-hour (5.77 grams per megajoule), as measured under transient operating conditions.

(B) 0.50 percent of exhaust gas flow at curb idle (methanol-fueled diesel only).

(iii) *Oxides of nitrogen.* (A) 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(B) A manufacturer may elect to include some or all of its diesel heavy-duty engine families in the heavy-duty NO<sub>x</sub> averaging program, provided that engines produced for sale in California or in 49 state areas may be averaged only within each of those areas. Averaging is limited to within fuel types (petroleum or methanol). Averaging is limited to engines within a given primary service class as defined in § 86.085-2. Averaging across primary service classes is not permitted. If the manufacturer elects to participate in the NO<sub>x</sub> averaging program, individual family NO<sub>x</sub> emission limits may not exceed 6.0 grams per brake horsepower-hour (2.2 grams per megajoule).

(iv) *Particulate.* (A) For diesel engines to be used in urban buses, 0.10 grams per brake horsepower-hour (0.037 gram per megajoule), as measured under transient operating conditions.

(B) For all other diesel engines only, 0.25 gram per brake horsepower-hour (0.093 gram per megajoule), as measured under transient operating conditions.

(C) A manufacturer may elect to include all or some of its diesel heavy-duty engine families, exclusive of engines to be used in urban buses, in the appropriate heavy-duty particulate averaging program (petroleum or methanol), provided that engines produced for sale in California or in 49-state areas may be averaged only within each of those areas. Averaging is not permitted between fuel types. Engines for use in urban buses may not be included in either heavy-duty particulate

averaging program. Averaging is limited to engines within a given primary service class as defined in § 86.085-2. Averaging across primary service classes is not permitted. If the manufacturer elects to participate in either averaging program, individual family particulate limits may not exceed 0.60 gram per brake horsepower-hour (0.22 gram per megajoule).

(b) \* \* \*

(3) *Evaporative emissions* (total of non-oxygenated hydrocarbons plus methanol) from 1991 and later model year heavy-duty vehicles equipped with methanol-fueled diesel engines shall not exceed:

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs, 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs, 4.0 grams per test.

(4)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs, the standards set forth in paragraph (b)(3) of this section refer to a composite sample of evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs, the standard set forth in paragraph (b)(3)(ii) of this section refers to the manufacturers, engineering design evaluation using good engineering practice (a statement of which is required in § 86.091-23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1991 or later model year methanol-fueled diesel, or any naturally-aspirated diesel heavy-duty engine. For petroleum fueled engines only, this provision does not apply to engines using turbochargers, pumps, blowers, or superchargers for air induction.

\* \* \*

13. Section 86.094-11 of Subpart A is amended by revising paragraphs (a)(1) and (c), and adding new paragraphs (b)(3) and (b)(4) to read as follows:

**§ 86.094-11 Emission standards for 1994 and later model year diesel heavy-duty engines and vehicles.**

(a)(1) Exhaust emissions from new 1994 and later model year diesel heavy-duty engines shall not exceed the following:

(i)(A) *Hydrocarbons (for petroleum-fueled diesel engines)*. 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(B) *Organic Material Hydrocarbon Equivalent (for methanol-fueled diesel*

*engines)*. 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(ii) *Carbon monoxide*. (A) 15.5 grams per brake horsepower-hour (5.77 grams per megajoule), as measured under transient operating conditions.

(B) 0.50 percent of exhaust gas flow at curb idle (methanol-fueled diesel only).

(iii) *Oxides of nitrogen*. [Reserved]

(iv) *Particulate*. (A) 0.10 grams per brake horsepower-hour (0.037 gram per megajoule), as measured under transient operating conditions.

(B) A manufacturer may elect to include all or some of its diesel heavy-duty engine families, exclusive of engines to be used in urban buses, in the appropriate heavy-duty particulate averaging program (petroleum or methanol), provided that engines produced for sale in California or in 49-state areas may be averaged only within each of those areas. Averaging is not permitted between fuel types. Engines for use in urban buses may not be included in either heavy-duty particulate averaging program. Averaging is limited to engines within a given primary service class as defined in § 86.085-2. Averaging across primary service classes is not permitted. If the manufacturer elects to participate in either averaging program, individual family particulate limits may not exceed 0.60 gram per brake horsepower-hour (0.22 gram per megajoule).

\* \* \*

(b) \* \* \*

(3) *Evaporative emissions* (total of non-oxygenated hydrocarbons plus methanol) from 1994 and later model year heavy-duty vehicles equipped with methanol-fueled diesel engines shall not exceed:

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs, 3.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs, 4.0 grams per test.

(4)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs, the standards set forth in paragraph (b)(3) of this section refer to a composite sample of evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs, the standard set forth in paragraph (b)(3)(ii) of this section refers to the manufacturers, engineering design evaluation using good engineering practice (a statement of which is required in § 86.091 23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1994 or later model year methanol-fueled diesel, or any naturally-aspirated diesel heavy-duty engine. For petroleum-fueled engines only, this provision does not apply to engines using turbochargers, pumps, blowers, or superchargers for air induction.

\* \* \*

14. A new § 86.090-14 is added to Subpart A to read as follows:

**§ 86.090-14 Small-volume manufacturers certification procedures.**

(a) The small-volume manufacturers certification procedures described in paragraphs (b) and (c) of this section are optional. Small-volume manufacturers may use these optional procedures to demonstrate compliance with the general standards and specific emission requirements contained in this subpart.

(b)(1) The optional small-volume manufacturers certification procedures apply to light-duty vehicles, light-duty trucks, and heavy-duty engines produced by manufacturers with U.S. sales (for the model year in which certification is sought) of fewer than 10,000 units (light-duty vehicles, light-duty trucks, and heavy-duty engines combined).

(2) For the purpose of determining the applicability of paragraph (b)(1) of this section, where there is more than one importer or distributor of vehicles and/or engines manufactured by the same person, the sales the Administrator shall use shall be the aggregate of the projected or actual sales of those vehicles and/or engines by all of the importers and distributors.

(c) Small-volume manufacturers shall demonstrate compliance with the applicable sections of this subpart as follows:

(1) Sections 86.090-1, 86.088-2, 86.090-3, 86.084-4, 86.090-5, 86.078-6, 86.078-7, and 86.090-8 through 86.090-11 are applicable.

(2) Section 86.080-12 is not applicable.

(3) Sections 86.085-13, 86.090-14, 86.084-15, and 86.085-20 are applicable.

(4) Small-volume manufacturers shall include in its records all of the information that EPA requires in § 86.090-21. This information will be considered part of the manufacturer's application for certification. However, the manufacturer is not required to submit the information to the Administrator unless the Administrator requests it.

(5) Section 86.085-22 is applicable except as noted below.

(i) Small-volume light-duty vehicle and light-duty truck manufacturers may

satisfy the requirements of paragraph (e) of § 86.085-22 by including a statement of compliance on adjustable parameters in the application for certification. In the statement of compliance the manufacturer shall state that the limits, stops, seals, or other means used to inhibit adjustment have been designed to accomplish their intended purpose based on good engineering practice and past experience. If the vehicle parameter is adjustable the vehicle must meet emission standards with the parameter set any place within the adjustable range (reference § 86.090-21).

(ii) Paragraphs (a), (b), (c), and (d) of § 86.085-22 are not applicable.

(6) Section 86.090-23 is applicable.

(7) Section 86.085-24 is applicable except as noted below.

(i) Small-volume manufacturers may satisfy the requirements of paragraphs (b) and (c) of § 86.085-24 by:

(A) Selecting emission-data test vehicles (engines) by the worst case emissions criteria as follows:

(1) *Light-duty vehicles and light-duty trucks.* The test vehicle shall be selected based on the following criteria: The manufacturer shall select the heaviest (including options) vehicle within the family. Then within that vehicle it shall select, in the order listed, the largest frontal area, largest displacement, the highest numerical axle ratio with the largest tire offered in the engine family, and the maximum fuel flow calibration.

(2) *Heavy-duty Otto-cycle engines.* The manufacturer shall select the worst case emission-data engine first based on the largest displacement within the engine family. Then within the largest displacement the manufacturer shall select, in the order listed, highest fuel flow at the speed of maximum rated torque, the engine with the most advance spark timing, no EGR or lowest EGR flow, and no air pump or lowest actual flow air pump.

(3) *Heavy-duty diesel engines.* The manufacturer shall select in each engine family the worst case emission data engine based on the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed.

(B) Testing light-duty vehicle or light-duty truck emission-data vehicles at any service accumulation distance less than 6,436 kilometers (4,000 miles) or heavy-duty engine emission-data engines at any service accumulation time less than 125 hours.

(C) Using assigned deterioration factors that the Administrator determines and prescribes. However, the manufacturer may, at its option, accumulate miles (hours) on a durability-data vehicle (engine) and

complete emission tests for the purpose of establishing its own deterioration factor.

(ii) Paragraphs (d) and (e) of § 86.085-24 are not applicable.

(8) Section 86.090-25 is applicable to durability-data light-duty vehicles, light-duty trucks, and heavy-duty engines if the manufacturer does not use assigned deterioration factors.

(9) Sections 86.084-26 and 86.085-27 are not applicable.

(10) Sections 86.090-28 and 86.090-29 are applicable.

(11)(i) Section 86.090-30 of this subpart is applicable, except for paragraphs (a)(2) and (b) of that section. In the place of these paragraphs, small-volume manufacturers shall comply with paragraphs (c)(11), (ii) through (v) of this section.

(ii) Small-volume manufacturers shall submit an application for certification containing the following:

(A) The names, addresses, and telephone numbers of the persons the manufacturer authorizes to communicate with us.

(B) A brief description of the vehicles (or engines) covered by the certificate (the manufacturers' sales data book or advertising, including specifications, may satisfy this requirement for most manufacturers). The description shall include, as a minimum, the following items as applicable:

(1) Engine families and vehicle (or engine) configurations.

(2) Vehicle or engine models to be listed on the certificate of conformity.

(3) The test weight and horsepower setting for each vehicle or engine configuration.

(4) Projected sales.

(5) Combustion cycle.

(6) Cooling mechanism.

(7) Number of cylinders.

(8) Displacement.

(9) Fuel system type.

(10) Number of catalytic converters, volume, and composition.

(11) Method of air aspiration.

(12) Thermal reactor characteristics.

(13) Suppliers' and/or manufacturer's name and model number of any emission-related items identified in paragraphs (c)(11)(ii)(B) (1) through (12) of this section, if purchased from a supplier or manufacturer who uses the items in its own certified vehicles(s) or engine(s).

(14) A list of emission component part numbers.

(15) Drawings, calibration curves, and descriptions of emission related components, including those components regulated under paragraph (e) of § 86.085-22, and schematics of

hoses and other devices connecting these components.

(16) Vehicle adjustments or modifications necessary for light duty trucks to assure that they conform to high altitude standards.

(17) A description of the light-duty vehicles and light-duty trucks that are exempted from either the low- or high-altitude emission standards, as applicable.

(C) The results of all emission tests the manufacturer performs to demonstrate compliance with the applicable standards.

(D)(1) The following statement signed by the authorized representative of the manufacturer: "The vehicles (or engines) described herein have been tested in accordance with [list of the applicable Subparts A, B, D, I, N, or P] of Part 86, Title 40, United States Code of Federal Regulations, and on the basis of those tests are in conformance with that subpart. All of the data and records required by that subpart are on file and are available for inspection by the EPA Administrator. We project the total U.S. sales of vehicles (engines) subject to this subpart to be fewer than 10,000 units."

(2) A statement as required by and contained in paragraph (c)(5) of § 86.090-14 signed by the authorized representative of the manufacturer.

(3) A statement that the vehicles or engines described in the manufacturers application for certification are not equipped with auxiliary emission control devices which can be classified as a defeat device as defined in § 86.084-2.

(4) A statement of compliance with section 206(a)(3) of the Clean Air Act.

(5) A statement that, based on the manufacturer's engineering evaluation and/or emission testing, the light-duty vehicles comply with emission standards at high altitude unless exempt under paragraph (h) of § 86.090-8.

(6) A statement that, based on the manufacturers engineering evaluation and/or emission testing, the light-duty trucks sold for principle use at designated high-altitude locations comply with the high-altitude emission requirements and that all other light-duty trucks are at least capable of being modified to meet high altitude standards unless exempt under paragraph (g)(2) of § 86.090-9.

(iii) If the manufacturer meets requirements of this subpart, the Administrator will issue a certificate of conformity for the vehicles described in the application for certification.

(iv) The certificate will be issued for such a period not to exceed one model year as the Administrator may

determine and upon such terms as he may deem necessary to assure that any vehicle or engine covered by the certificate will meet the requirements of the Act and of this subpart.

(v)(A) If, after a review of the statements and descriptions submitted by the manufacturer, the Administrator determines that the manufacturer has not met the applicable requirements, the Administrator shall notify the manufacturer in writing, setting forth the basis for his determination. The manufacturer may request a hearing on the Administrator's determination.

(B) If the manufacturer does not request a hearing or present the required information the Administrator will deny certification.

(12) Sections 86.079-31 and 86.079-32 are not applicable

(13) Under § 86.079-33, small-volume manufacturers are covered by the following:

(i) Small-volume manufacturers may make production changes (running changes) without receiving the Administrator's prior approval. The manufacturer shall assure (by conducting emission tests as it deems necessary) that the affected vehicles (engines) remain in compliance with the requirements of this part.

(ii) The manufacturer shall notify the Administrator within seven days after implementing any production related change (running change) that would affect vehicle emissions. This notification shall include any changes to the information required under paragraph (c)(11)(ii) of this section. The manufacturer shall also amend as necessary its records required under paragraph (c)(4) of this section to conform with the production design change.

(14) Section 86.082-34 is not applicable.

(15) Sections 86.090-35, 86.079-36, 86.082-37, 86.087-38, and 86.084-39 are applicable.

15. A new § 86.090-21 is added to Subpart A to read as follows:

**§ 86.090-21 Application for certification.**

(a) A separate application for a certificate of conformity shall be made for each set of standards (or family emission limits, as appropriate) and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1)(i) Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control system and fuel system components. This shall include a detailed description of each auxiliary emission control device (AECD) to be installed in or on any certification test vehicle (or certification test engine).

(ii)(A) The manufacturer shall provide to the Administrator in the application for certification:

(1) A list of those parameters which are physically capable of being adjusted (including those adjustable parameters for which access is difficult) and that, if adjusted to settings other than the manufacturer's recommended setting, may affect emissions;

(2) A specification of the manufacturer's intended physically adjustable range of each such parameter, and the production tolerances of the limits or stops used to establish the physically adjustable range;

(3) A description of the limits or stops used to establish the manufacturer's intended physically adjustable range of each adjustable parameter, or any other means used to inhibit adjustment;

(4) The nominal or recommended setting, and the associated production tolerances, for each such parameter.

(B) The manufacturer may provide, in the application for certification, information relating to why certain parameters are not expected to be adjusted in actual use and to why the physical limits or stops used to establish the physically adjustable range of each parameter, or any other means used to inhibit adjustment, are expected to be effective in preventing adjustment of parameters on in-use vehicles to settings outside the manufacturer's intended physically adjustable ranges. This may include results of any tests to determine the difficulty of gaining access to an adjustment or exceeding a limit as intended or recommended by the manufacturer.

(C) The Administrator may require to be provided detailed drawings and descriptions of the various emission related components, and/or hardware samples of such components, for the purpose of making his determination of which vehicle or engine parameter will be subject to adjustment for new certification and Selective Enforcement Audit testing and of the physically adjustable range for each such vehicle or engine parameter.

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is

requested. The sales data shall also include the altitude of intended sale for light-duty trucks.

(3) A description of the test equipment and fuel proposed to be used.

(4)(i) For light-duty vehicles and light duty trucks, a description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.090-23(b)(2).

(ii) For heavy duty vehicles equipped with gasoline-fueled or methanol-fueled engines, the Administrator does not assume that each evaporative emission family-evaporative emission control system combination will deteriorate in a unique manner during the useful life of the vehicle. The manufacturer shall therefore identify those evaporative emission deterioration factors which shall be applied to the various evaporative emission family-evaporative emission control system combinations which are expected to exhibit similar deterioration characteristics during the useful life of the vehicle.

(iii)(A) A description of the test procedures to be used to establish the durability data or the exhaust emission deterioration factors required to be determined and supplied in § 86.088-23(b)(1).

(B)(1) For engine families provided an alternative useful-life period under paragraph (f) of this section, a statement of that alternative period and a brief synopsis of the justification.

(2) For heavy-duty diesel engine families, a statement of the primary intended service class (light, medium, or heavy) and an explanation as to why that service class was selected. Each diesel engine family shall be certified under one primary intended service class only. After reviewing the guidance in § 86.085-2, the class shall be determined on the basis of which class best represents the majority of the sales of that engine family.

(C)(1) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(2) A description of vehicle adjustments or modifications necessary, if any, to assure that light-duty vehicles and light-duty trucks covered by a certificate of conformity conform to the regulations while being operated at any altitude locations, and a statement of

the altitude at which the adjustments or modifications apply.

(D) At the option of the manufacturer, the proposed composition of the emission-data test fleet or (where applicable) the durability-data test fleet.

(5)(i)(A) If the manufacturer elects to participate in the particulate averaging program for diesel light-duty vehicles and/or diesel light-duty trucks, the application must list the family particulate emission limit and the projected U.S. production volume of the family for the model year.

(B) The manufacturer shall choose the level of the family particulate emission limits, accurate to one-hundredth of a gram per mile.

(C) The manufacturer may at any time during production elect to change the level of any family diesel particulate emission limit(s) by submitting the new limit(s) to the Administrator and by demonstrating compliance with the limit(s) as described in § 86.085-2 and § 86.088-28(b)(5)(i).

(ii)(A) If the manufacturer elects to participate in the NO<sub>x</sub> averaging program for light-duty trucks, the application must list the family NO<sub>x</sub> emission limit and the projected U.S. production volume of the family for the model year.

(B) The manufacturer shall choose the level of the family NO<sub>x</sub> emission limits, accurate to one-tenth of a gram per mile.

(C) The manufacturer may at any time during production elect to change the level of any family NO<sub>x</sub> emission limit(s) by submitting the new limits to the Administrator and by demonstrating compliance with the limit(s) as described in § 86.088-2 and § 86.088-28(b)(5)(ii).

(6)(i) For Otto-cycle heavy-duty engines, the application must state whether the engine family is being certified for use in all vehicles regardless of their Gross Vehicle Weight Rating (see § 86.088-10 (a)(1)(i) and (a)(3)(i)), or, only for use in vehicles with a Gross Vehicle Weight Rating greater than 14,000 pounds.

(ii) If the engine family is being certified for use in all vehicles and, is being certified to the emission standards applicable to Otto-cycle heavy-duty engines for use only in vehicles with a Gross Vehicle Weight Rating over 14,000 pounds under the provisions of paragraph (a)(3) of § 86.088-10, then the application must also attest that the engine family, together with all other engine families being certified under the provisions of paragraph (a)(3) of § 86.088-10, represent no more than 5 percent of model year sales of the manufacturer of all Otto-cycle heavy duty engines for use in vehicles with

Gross Vehicle Weight Ratings of up to 14,000 pounds.

(iii)(A) A description of the test procedures to be used to establish the durability data or the exhaust emission deterioration factors required to be determined and supplied in § 86.088-23(b)(1).

(B)(1) A statement of the useful life of use of each light-duty truck engine family and heavy-duty engine family.

(2) For engine families provided an alternative useful life period under paragraph (f) of this section, a statement of that alternative period and a brief synopsis of the justification.

(3) For heavy-duty diesel engine families, a statement of the primary intended service class (light, medium, or heavy) and an explanation as to why that service class was selected. Each diesel engine family shall be certified under one primary intended service class only. After reviewing the guidance in § 86.085-2, the class shall be determined on the basis of which class best represents the majority of the sales of that engine family.

(7) For each light-duty vehicle engine family, a statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance and the equipment required.

(8) For each light-duty vehicle engine family, the proposed composition of the emission-data test fleet and the durability-data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under § 86.079-32, § 86.079-33, and § 86.082-84 shall be submitted in such multiple copies as the Administrator may require.

(d) Incomplete light-duty trucks shall have a maximum completed curb weight and maximum completed frontal area specified by the manufacturer.

(e) For vehicles equipped with gasoline-fueled or methanol-fueled heavy-duty engines, the manufacturer shall specify a maximum nominal fuel tank capacity for each evaporative emission family-evaporative emission control system combination.

(f) Light-duty truck and heavy-duty engine manufacturers who believe that the useful life periods of § 86.085-2 are significantly unrepresentative for one or more engine families (either too long or too short), may petition the Administrator to provide an alternative useful-life period. This petition must include the full rationale behind the request together with any supporting

data and other evidence. Based on this or other information the Administrator may assign an alternative useful-life period. Any petition should be submitted in a timely manner, to allow adequate time for a thorough evaluation.

16. Section 86.091-21 of Subpart A is amended by revising paragraphs (a), (b)(4)(i), (b)(4)(ii), (b)(5)(ii), (b)(6)(i)(A), (b)(6)(i)(C), (b)(7)(i), (b)(7)(ii), (e) and (f), to read as follows:

**§ 86.091-21 Application for certification.**

(a) A separate application for a certificate of conformity shall be made for each set of standards (or family emission limits, as appropriate) and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) \* \* \*

(4)(i) For light-duty vehicles and light-duty trucks, a description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.091-23(b)(2).

(ii) For heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines, the Administrator does not assume that each evaporative emission family-evaporative emission control system combination will deteriorate in a unique manner during the useful life of the vehicle. The manufacturer shall therefore identify those evaporative emission deterioration factors which shall be applied to the various evaporative emission family-evaporative emission control system combinations which are expected to exhibit similar deterioration characteristics during the useful life of the vehicle.

\* \* \* \* \*

(5) \* \* \*

(ii) For heavy-duty diesel engine families, a statement of the primary intended service class (light, medium, or heavy) and an explanation as to why that service class was selected. Each diesel engine family shall be certified under one primary intended service class only. After reviewing the guidance in § 86.090-2, the class shall be determined on the basis of which class best represents the majority of the sales of that engine family.

\* \* \* \* \*

(6)(i)(A) If the manufacturer elects to participate in the particulate averaging program for diesel light-duty vehicles and/or diesel light-duty trucks, or the particulate averaging program for heavy-duty diesel engines, the application must list the family

particulate emission limit and the projected U.S. production volume of the family for the model year.

(B) \* \* \*

(C) The manufacturer may at any time during production elect to change the level of any family particulate emission limit(s) by submitting the new limit(s) to the Administrator and by demonstrating compliance with the limit(s) as described in § 86.090-2 and § 86.091-28(b)(5)(i).

\* \* \* \* \*

(7)(i) For Otto-cycle heavy-duty engines, the application must state whether the engine family is being certified for use in all vehicles regardless of their Gross Vehicle Weight Rating (see § 86.091-10 (a)(1)(i) and (a)(3)(i)), or, only for use in vehicles with a Gross Vehicle Weight Rating greater than 14,000 pounds.

(ii) If the engine family is being certified for use in all vehicles and, is being certified to the emission standards applicable to Otto-cycle engines for use only in vehicles with a Gross Vehicle Weight Rating over 14,000 pounds under the provisions of paragraph (a)(3) of § 86.091-10, then the application must also attest that the engine family, together with all other engine families being certified under the provisions of paragraph (a)(3) of § 86.091-10, represent no more than 5 percent of model year sales of the manufacturer of all Otto-cycle heavy-duty engines for use in vehicles with Gross Vehicle Weight Ratings of up to 14,000 pounds.

\* \* \* \* \*

(e) For vehicles equipped with gasoline-fueled or methanol-fueled heavy-duty engines, the manufacturer shall specify a maximum nominal fuel tank capacity for each evaporative emission family-evaporative emission control system combination.

(f) Light-duty truck and heavy-duty engine manufacturers who believe that the useful life periods of § 86.090-2 are significantly unrepresentative for one or more engine families (either too long or too short), may petition the Administrator to provide an alternative useful-life period. This petition must include the full rationale behind the request together with any supporting data and other evidence. Based on this or other information the Administrator may assign an alternative useful-life period. Any petition should be submitted in a timely manner, to allow adequate time for a thorough evaluation.

17. A new § 86.090-22 is added to Subpart A, to read as follows:

**§ 86.090-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges.**

(a) After a review of the application for certification and any other information which the Administrator may require, the Administrator may approve the application and select a test fleet in accordance with § 86.090-24.

(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed mileage (or service) accumulation procedures, test equipment, or fuel, and incorporation of defeat devices in vehicles (or on engines) described by the application.

(c) Where any part of an application is rejected, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. Within 30 days following receipt of such notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after the review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(d)(1) The Administrator does not approve the test procedures for establishing the evaporative emission deterioration factors for light-duty vehicles and light-duty trucks. The manufacturer shall submit the procedures as required in § 86.090-21(b)(4)(i) prior to the Administrator's selection of the test fleet under § 86.090-24(b)(1) and if such procedures will involve testing of durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.090-24(c)(1), prior to initiation of such testing.

(2) *Light-duty trucks and heavy-duty engines only.* The Administrator does not approve the test procedures for establishing exhaust emission deterioration factors. The manufacturer shall submit these procedures and determinations as required in § 86.090-21(b)(4)(iii) prior to determining the deterioration factors.

(3) *Heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines only.* The Administrator does

not approve the test procedures for establishing the evaporative emission deterioration factors. The test procedure will conform to the requirements in § 86.090-23(b)(3).

(e) When the Administrator selects emission-data vehicles for the test fleet, he will at the same time determine those vehicle or engine parameters which will be subject to adjustment for certification, Selective Enforcement Audit and Production Compliance Audit testing, the adequacy of the limits, stops, seals, or other means used to inhibit adjustment, and the resulting physically adjustable ranges for each such parameter and notify the manufacturer of his determinations.

(1)(i) Except as noted in paragraph (e)(1)(iv) of this section, the Administrator may determine to be subject to adjustment the idle fuel-air mixture parameter on Otto-cycle vehicles (or engines) (carbureted or fuel-injected); the choke valve action parameter(s) on carbureted, Otto-cycle vehicles (or engines); or any parameter on any vehicle (or engine) (Otto-cycle or diesel) which is physically capable of being adjusted, may significantly affect emissions, and was not present on the manufacturer's vehicles (or engines) in the previous model year in the same form and function.

(ii) The Administrator may, in addition, determine to be subject to adjustment any other parameters on any vehicle or engine which is physically capable of being adjusted and which may significantly affect emissions. However, the Administrator may do so only if he has previously notified the manufacturer that he might do so and has found, at the time he gave this notice, that the intervening period would be adequate to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period. In no event will this notification be given later than September 1 of the calendar year two years prior to the model year.

(iii) In determining the parameters subject to adjustment the Administrator will consider the likelihood that, for each of the parameters listed in paragraphs (e)(1)(i) and (e)(1)(ii) of this section, settings other than the manufacturer's recommended setting will occur on in-use vehicles (or engines). In determining likelihood, the Administrator may consider such factors as, but not limited to, information contained in the preliminary application, surveillance information from similar in-use vehicles (or engines), the difficulty and cost of gaining access

to an adjustment, damage to the vehicle (or engine) if an attempt is made to gain such access and the need to replace parts following such attempt, and the effect of settings other than the manufacturer's recommended setting on vehicle (or engine) performance characteristics including emission characteristics.

(iv) Manual chokes of heavy-duty engines only will not be considered a parameter subject to adjustment under the parameter adjustment requirements.

(2)(i) The Administrator shall determine a parameter to be adequately inaccessible or sealed if:

(A) In the case of an idle mixture screw, the screw is recessed within the carburetor casting and sealed with lead, thermosetting plastic, or an inverted elliptical spacer or sheared off after adjustment at the factory, and the inaccessibility is such that the screw cannot be accessed and/or adjusted with simple tools in one-half hour or for \$20 (1978 dollars) or less.

(B) In the case of a choke bimetal spring, the plate covering the bimetal spring is riveted or welded in place, or held in place with nonreversible screws.

(C) In the case of a parameter which may be adjusted by elongating or bending adjustable members (e.g., the choke vacuum break), the elongation of the adjustable member is limited by design or, in the case of a bendable member, the member is constructed of a material which when bent would return to its original shape after the force is removed (plastic or spring steel materials).

(D) In the case of any parameter, the manufacturer demonstrates that adjusting the parameter to settings other than the manufacturer's recommended setting takes more than one-half hour or costs more than \$20 (1978 dollars).

(ii) The Administrator shall determine a physical limit or stop to be an adequate restraint on adjustability if:

(A) In the case of a threaded adjustment, the threads are terminated, pinned or crimped so as to prevent additional travel without breakage or need for repairs which take more than one-half hour or cost more than \$20 (1978 dollars).

(B) The adjustment is ineffective at the end of the limits of travel regardless of additional forces or torques applied to the adjustment.

(C) The manufacturer demonstrates that travel or rotation limits cannot be exceeded with the use of simple and inexpensive tools (screwdriver, pliers, open-end or box wrenches, etc.) without incurring significant and costly damage to the vehicle (or engine) or control system or without taking more than one-

half hour or costing more than \$20 (1978 dollars).

(iii) If manufacturer service manuals or bulletins describe routine procedures for gaining access to a parameter or for removing or exceeding a physical limit, stop, seal or other means used to inhibit adjustment, or if surveillance data indicate that gaining access, removing, or exceeding is likely, paragraphs (e)(2)(i) and (e)(2)(ii) of this section shall not apply for that parameter.

(iv) In determining the adequacy of a physical limit, stop, seal, or other means used to inhibit adjustment of a parameter not covered by paragraph (e)(2)(i) or (e)(2)(ii) of this section, the Administrator will consider the likelihood that it will be circumvented, removed, or exceeded on in-use vehicles. In determining likelihood, the Administrator may consider such factors as, but not limited to, information contained in the preliminary application; surveillance information from similar in-use vehicles (or engines); the difficulty and cost of circumventing, removing, or exceeding the limit, stop, seal, or other means; damage to the vehicle (or engine) if an attempt is made to circumvent, remove, or exceed it and the need to replace parts following such attempt; and the effect of settings beyond the limit, stop, seal, or other means on vehicle (or engine) performance characteristics other than emission characteristics.

(3) The Administrator shall determine two physically adjustable ranges for each parameter subject to adjustment:

(i)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator may include within the physically adjustable range applicable to testing under this subpart (certification testing) all settings within the production tolerance associated with the nominal setting for that parameter, as specified by the manufacturer in the preliminary application for certification.

(B) In the case of other parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability. The Administrator may also include the production tolerances on the location of these limits or stops when determining the physically adjustable range.

(ii)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator shall include within the physically adjustable range applicable to testing under Subpart G or K (Selective Enforcement Audit and Production Compliance Audit) only the

actual settings to which the parameter is adjusted during production.

(B) In the case of other parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability, as they are actually located on the test vehicle (or engine).

(f)(1) If the manufacturer submits the information specified in § 86.090-21(b)(1)(ii) in advance of its full preliminary application for certification, the Administrator shall review the information and make the determinations required in paragraph (e) of this section within 90 days of the manufacturer's submittal.

(2) The 90-day decision period is exclusive of the elapsed time during which EPA may request additional information from manufacturers regarding an adjustable parameter and the receipt of the manufacturers' response(s).

(g) Within 30 days following receipt of notification of the Administrator's determinations made under paragraph (e) of this section, the manufacturer may request a hearing on the Administrator's determinations. The request shall be in writing, signed by an authorized representative of the manufacturer, and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

18. A new § 86.090-23 is added to Subpart A to read as follows:

**§ 86.090-23 Required data.**

(a) The manufacturer shall perform the tests required by the applicable test procedures, and submit to the Administrator the following information: *Provided, however*, that if requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles (or engines) for which emission data are available or will be made available under the provisions of § 86.090-29.

(b)(1)(i) Exhaust emission durability data on such light-duty vehicles tested in accordance with applicable test procedures and in such numbers as specified, which will show the performance of the systems installed on or incorporated in the vehicle for extended mileage, as well as a record of

all pertinent maintenance performed on the test vehicles.

(ii) Exhaust emission deterioration factors for light-duty trucks and heavy-duty engines, and all test data that are derived from the testing described under § 86.090-21(b)(4)(iii)(A), as well as a record of all pertinent maintenance. Such testing shall be designed and conducted in accordance with good engineering practice to assure that the engines covered by a certificate issued under § 86.090-30 will meet the emission standards (or family emission limits, as appropriate) in § 86.090-9, § 86.090-10, or § 86.090-11 as appropriate, in actual use for the useful life of the engine.

(2) For light-duty vehicles and light-duty trucks, evaporative emission deterioration factors for each evaporative emission family- evaporative emission control system combination and all test data that are derived from testing described under § 86.090-21(b)(4)(i) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.090-30 will meet the evaporative emission standards in § 86.090-8 or § 86.090-9, as appropriate, for the useful life of the vehicle.

(3) For heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines, evaporative emission deterioration factors for each evaporative emission family- evaporative emission control system combination identified in accordance with § 86.090-21(b)(4)(ii). Furthermore, a statement that the test procedure(s) used to derive the deterioration factors includes, but need not be limited to, a consideration of the ambient effects of ozone and temperature fluctuations, and the service accumulation effects of vibration, time, and vapor saturation and purge cycling. The deterioration factor test procedure shall be designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.090-30 will meet the evaporative emission standards in § 86.090-10 and § 86.090-11 in actual use for the useful life of the engine. Furthermore, a statement that a description of the test procedure, as well as all data, analyses and evaluations, is available to the Administrator upon request.

(4)(i) For heavy-duty vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs. and equipped with gasoline-fueled or methanol-fueled engines, a written statement to the Administrator certifying that the manufacturer's vehicles meet the standards of § 86.090-10 or § 86.090-11 (as applicable) as

determined by the provisions of § 86.090-28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are available to the Administrator upon request.

(ii) For heavy-duty vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs. and equipped with gasoline-fueled or methanol-fueled engines, a written statement to the Administrator certifying that the manufacturer's evaporative emission control systems are designed, using good engineering practice, to meet the standards of § 86.090-10 or § 86.090-11 (as applicable) as determined by the provisions of § 86.090-28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are available to the Administrator upon request.

(c) Emission data. (1) Emission data, including in the case of methanol fuel, methanol, formaldehyde and organic material hydrocarbon equivalent on such vehicles tested in accordance with applicable test procedures and in such numbers as specified. These data shall include zero-mile data, if generated and emission data generated for certification as required under § 86.090-26(a)(3)(i) or § 86.090-26(a)(3)(ii). In lieu of providing emission data on idle CO emissions, smoke emissions or particulate emissions from methanol-fueled diesel certification vehicles the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable emission standards of § 86.090-8 or § 86.090-9.

(2) Certification engines. (i) Emission data on such engines tested in accordance with applicable emission test procedures of this subpart and in such numbers as specified. These data shall include zero-hour data, if generated, and emission data generated for certification as required under § 86.090-26(c)(4). In lieu of providing emission data on idle CO emissions, smoke emissions or particulate emissions from methanol-fueled diesel certification vehicles, or on CO emissions from petroleum-fueled or methanol-fueled diesel certification engines the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the

applicable emission standards of § 86.090-11.

(ii) For heavy-duty diesel engines, a manufacturer may submit hot-start data only, in accordance with Subpart N, when making application for certification. However, for conformity SEA and recall testing by the Agency, both the cold-start and hot-start test data, as specified in Subpart N, will be included in the official results.

(d) A statement that the vehicles (or engines) for which certification is requested conform to the requirements in § 86.090-5(b), and that the descriptions of tests performed to ascertain compliance with the general standards in § 86.090-5(b), and the data derived from such tests, are available to the Administrator upon request.

(e)(1) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with the applicable standards (or family emission limits, as appropriate) of this subpart are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification and that on the basis of such tests the vehicles (or engines) conform to the requirements of this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicles (or test engine) was not as described in the application for certification or was not tested in accordance with the applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards (or family emission limits, as appropriate). The provisions of § 86.090-30(b) shall then be followed.

(2) For evaporative emission durability, or light-duty truck or heavy-duty engine exhaust emission durability, a statement of compliance with paragraph (b)(1)(ii), (b)(2), or (b)(3) of this section, as applicable.

(f) Additionally, manufacturers participating in the particulate averaging program for diesel light-duty vehicles and diesel light-duty trucks shall submit:



(1) In the application for certification, a statement that the vehicles for which certification is requested will not, to the best of the manufacturer's belief, when included in the manufacturer's production-weighted average emission level, cause the applicable particulate standard(s) to be exceeded.

(2) No longer than 90 days after the end of a given model year of production of engine families included in the diesel particulate averaging program, the number of vehicles produced in each engine family at each certified family diesel particulate emission limit, along with the resulting production-weighted average particulate emission level.

(g) Additionally, manufacturers participating in the NO<sub>x</sub> averaging program for light-duty trucks shall submit:

(1) In the application for certification, a statement that the vehicles for which certification is requested will not, to the best of the manufacturer's belief, when included in the manufacturer's production-weighted average emission level, cause the applicable NO<sub>x</sub> standard(s) to be exceeded.

(2) No longer than 90 days after the end of a given model year of production of engine families included in the light-duty truck NO<sub>x</sub> averaging program, the number of vehicles produced in each engine family at each certified family NO<sub>x</sub> emission limit, along with the resulting production-weighted average NO<sub>x</sub> emission level.

19. Section 86.091-23 of Subpart A is amended by revising paragraphs (b)(1)(ii), (b)(2), (b)(3), (b)(4), (c), (e)(1), (f) introductory text and (f)(2), to read as follows:

**§ 86.091-23 Required data.**

\* \* \* \* \*

(b)(1) \* \* \*

(ii) Exhaust emission deterioration factors for light-duty trucks and heavy-duty engines, and all test data that are derived from the testing described under § 86.091-21(b)(4)(iii)(A), as well as a record of all pertinent maintenance. Such testing shall be designed and conducted in accordance with good engineering practice to assure that the engines covered by a certificate issued under § 86.091-30 will meet the emission standards (or family emission limits, as appropriate) in § 86.091-9, § 86.091-10, or § 86.091-11 as appropriate, in actual use for the useful life of the engine.

(2) For light-duty vehicles and light-duty trucks, evaporative emission deterioration factors for each evaporative emission family-  
evaporative emission control system combination and all test data that are derived from testing described under

§ 86.091-21(b)(4)(i) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.091-30 will meet the evaporative emission standards in § 86.091-8 or § 86.091-9, as appropriate, for the useful life of the vehicle.

(3) For heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines, evaporative emission deterioration factors for each evaporative emission family-  
evaporative emission control system combination identified in accordance with § 86.091-21(b)(4)(ii). Furthermore, a statement that the test procedure(s) used to derive the deterioration factors includes, but need not be limited to, a consideration of the ambient effects of ozone and temperature fluctuations, and the service accumulation effects of vibration, time, and vapor saturation and purge cycling. The deterioration factor test procedure shall be designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.091-30 will meet the evaporative emission standards in § 86.091-10 and § 86.091-11 in actual use for the useful life of the engine. Furthermore, a statement that a description of the test procedure, as well as all data, analyses and evaluations, is available to the Administrator upon request.

(4)(i) For heavy-duty vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs and equipped with gasoline-fueled or methanol-fueled engines, a written statement to the Administrator certifying that the manufacturer's vehicles meet the standards of § 86.091-10 or § 86.091-11 (as applicable) as determined by the provisions of § 86.091-28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are available to the Administrator upon request.

(ii) For heavy-duty vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs and equipped with gasoline-fueled or methanol-fueled engines, a written statement to the Administrator certifying that the manufacturer's evaporative emission control systems are designed, using good engineering practice, to meet the standards of § 86.091-10 or § 86.091-11 (as applicable) as determined by the provisions of § 86.091-28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are

available to the Administrator upon request.

(c) *Emission data.* (1) Emission data, including in the case of methanol fuel, methanol, formaldehyde and organic material hydrocarbon equivalent on such vehicles tested in accordance with applicable test procedures and in such numbers as specified. These data shall include zero-mile data, if generated and emission data generated for certification as required under § 86.090-26(a)(3)(i) or § 86.090-26(a)(3)(ii). In lieu of providing emission data on idle CO emissions, smoke emissions or particulate emissions from methanol-fueled diesel certification vehicles the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable emission standards of § 86.090-8 or § 86.090-9.

(2) Certification engines. (i) Emission data on such engines tested in accordance with applicable emission test procedures of this subpart and in such numbers as specified. These data shall include zero-hour data, if generated, and emission data generated for certification as required under § 86.090-26(c)(4). In lieu of providing emission data on idle CO emissions or particulate emissions from methanol-fueled diesel certification engines, or on CO emissions from petroleum-fueled or methanol-fueled diesel certification engines the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable emission standards of § 86.091-11.

\* \* \* \* \*

(e)(1) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with the applicable standards (or family emission limits, as appropriate) of this subpart are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification and that on the basis of such tests the vehicles (or engines) conform to the requirements of this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the

data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicles (or test engine) was not as described in the application for certification or was not tested in accordance with the applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards (or family emission limits, as appropriate). The provisions of § 86.091-30(b) shall then be followed.

(f) Additionally, manufacturers participating in any of the diesel particulate averaging programs shall submit:

(2) No longer than 90 days after the end of a given model year of production of engine families included in one of the diesel particulate averaging programs, the number of vehicles (or engines) produced in each engine family at each certified family diesel particulate emission limit, along with the resulting production-weighted average particulate emission level.

20. A new § 86.090-24 is added to Subpart A to read as follows:

**§ 86.090-24 Test vehicles and engines.**

(a)(1) The vehicles or engines covered by an application for certification will be divided into groupings of engines which are expected to have similar emission characteristics throughout their useful life. Each group of engines with similar emission characteristics shall be defined as a separate engine family.

(2) To be classed in the same engine family, engines must be identical in all the following respects:

- (i) The cylinder bore center-to-center dimensions.
- (ii) [Reserved]
- (iii) [Reserved]
- (iv) The cylinder block configuration (air cooled or water cooled; L-6, 90° V-8, etc.).
- (v) The location of the intake and exhaust valves (or ports).
- (vi) The method of air aspiration.
- (vii) The combustion cycle.
- (viii) Catalytic converter characteristics.
- (ix) Thermal reactor characteristics.
- (x) Type of air inlet cooler (e.g., intercoolers and after-coolers) for diesel heavy-duty engines.

(3)(i) Engines identical in all the respects listed in paragraph (a)(2) of this section may be further divided into

different engine families if the Administrator determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

- (A) The bore and stroke.
- (B) The surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center positions.
- (C) The intake manifold induction port size and configuration.
- (D) The exhaust manifold port size and configuration.
- (E) The intake and exhaust valve sizes.

(F) The fuel system.  
(G) The camshaft timing and ignition or injection timing characteristics.

(ii) Light-duty trucks and heavy-duty engines produced in different model years and distinguishable in the respects listed in paragraph (a)(2) of this section shall be treated as belonging to a single engine family if the Administrator requires it, after determining that the engines may be expected to have similar emission deterioration characteristics.

(4) Where engines are of a type which cannot be divided into engine families based upon the criteria listed in paragraphs (a)(2) and (a)(3) of this section, the Administrator will establish families for those engines based upon those features most related to their emission characteristics. Engines that are eligible to be included in the same engine family based on the criteria in paragraphs (a)(2) and (a)(3)(i) of this section may be further divided into different engine families if the manufacturer determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

- (i) The dimension from the center line of the crankshaft to the center line of the camshaft.
- (ii) The dimension from the center line of the crankshaft to the top of the cylinder block head face.
- (iii) The size of the intake and exhaust valves (or ports).

(5) Gasoline-fueled and methanol-fueled light-duty vehicles and light-duty trucks covered by an application for certification will be divided into groupings which are expected to have similar evaporative emission characteristics throughout their useful life. Each group of vehicles with similar evaporative emission characteristics shall be defined as a separate evaporative emission family.

(6) For gasoline-fueled or methanol-fueled light-duty vehicles and light-duty trucks to be classed in the same

evaporative emission family, vehicles must be similar with respect to:

- (i) Type of vapor storage device (e.g., canister, air cleaner, crankcase).
- (ii) Basic canister design.
- (iii) Fuel system.

(7) Where vehicles are of a type which cannot be divided into evaporative emission families based on the criteria listed above, the Administrator will establish families for those vehicles based upon the features most related to their evaporative emission characteristics.

(8)(i) If the manufacturer elects to participate in the Alternative Durability Program, the engine families covered by an application for certification shall be grouped based upon similar engine design and emission control system characteristics. Each of these groups shall constitute a separate engine family group.

(ii) To be classed in the same engine family group, engine families must contain engines identical in all of the following respects:

- (A) The combustion cycle.
- (B) The cylinder block configuration (air-cooled or water-cooled; L-6, V-8, rotary, etc.).

(C) Displacement (engines of different displacement within 50 cubic inches or 15 percent of the largest displacement and contained within a multidisplacement engine family will be included in the same engine family group).

(D) Catalytic converter usage and basic type (noncatalyst, oxidation catalyst only, three-way catalyst equipped).

(9) Engine families identical in all respects listed in paragraph (a)(8) of this section may be further divided into different engine family groups if the Administrator determines that they are expected to have significantly different exhaust emission control system deterioration characteristics.

(10) A manufacturer may request the Administrator to include in an engine family group, engine families in addition to those grouped under the provisions of paragraph (a)(8) of this section. This request must be accompanied by information the manufacturer believes supports the inclusion of these additional engine families.

(11) A manufacturer may combine into a single engine family group those light-duty vehicle and light-duty truck engine families which otherwise meet the requirements of paragraphs (a)(8) through (a)(10) of this section.

(12) The vehicles covered by an application for certification equipped with gasoline-fueled or methanol-fueled

heavy-duty engines will be divided into groupings of vehicles on the basis of physical features which are expected to affect evaporative emissions. Each group of vehicles with similar features shall be defined as a separate evaporative emission family.

(13) For vehicles equipped with gasoline-fueled or methanol-fueled heavy-duty engines to be classed in the same evaporative emission family, vehicles must be identical with respect to:

(i) Method of fuel/air metering (*i.e.*, carburetion versus fuel injection).

(ii) Carburetor bowl fuel volume, within a 10 cc range.

(14) For vehicles equipped with gasoline-fueled or methanol-fueled heavy-duty engines to be classed in the same evaporative emission control system, vehicles must be identical with respect to:

(i) Method of vapor storage.

(ii) Method of carburetor sealing.

(iii) Method of air cleaner sealing.

(iv) Vapor storage working capacity, within a 20 g range.

(v) Number of storage devices.

(vi) Method of purging stored vapors.

(vii) Method of venting the carburetor during both engine off and engine operation.

(viii) Liquid fuel hose material.

(ix) Vapor storage material.

(15) Where vehicles equipped with gasoline-fueled or methanol-fueled heavy-duty engines are types which cannot be divided into evaporative emission family-control system combinations based on the criteria listed above, the Administrator will establish evaporative emission family-control system combinations for those vehicles based on features most related to their evaporative emission characteristics.

(b) Emission data.

(1) Emission-data vehicles. Paragraph (b)(1) of this section applies to light-duty vehicle and light-duty truck emission-data vehicles.

(i) Vehicles will be chosen to be operated and tested for emission data based upon engine family groupings. Within each engine family, one test vehicle will be selected based on the following criteria: The Administrator shall select the vehicle with the heaviest equivalent test weight (including options) within the family. Then within that vehicle the Administrator shall select, in the order listed, the highest road-load power, largest displacement, the transmission with the highest numerical final gear ratio (including overdrive), the highest numerical axle ratio offered in that engine family and the maximum fuel flow calibration.

(ii) The Administrator shall select one additional test vehicle from within each engine family. The vehicle selected shall be the vehicle expected to exhibit the highest emissions of those vehicles remaining in the engine family. If all vehicles within the engine family are similar the Administrator may waive the requirements of this paragraph.

(iii) Within an engine family and exhaust emission control system, the manufacturer may alter any emission-data vehicle (or other vehicles such as including current or previous model year emission-data vehicles, fuel economy data vehicles, and development vehicles provided they meet emission-data vehicles, protocol) to represent more than one selection under paragraphs (b)(1) (i), (ii), (iv), or (vii) of this section.

(iv) If the vehicles selected in accordance with paragraphs (b)(1) (i) and (ii) of this section do not represent each engine-system combination, then one vehicle of each engine-system combination not represented will be selected by the Administrator. The vehicle selected shall be the vehicle expected to exhibit the highest emissions of those vehicles remaining in the engine family.

(v) For high-altitude exhaust emission compliance for each engine family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the vehicle expected to exhibit the highest emissions from the nonexempt vehicles selected in accordance with § 86.090-24(b)(1) (ii), (iii), and (iv) of this section or,

(B) In lieu of testing vehicles according to paragraph (b)(1)(v)(A) of this section, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(1) That all light-duty vehicles not exempt under § 86.090-8(h) comply with the emission standards at high-altitude, and

(2) That light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements, and that all light-duty trucks sold at low-altitude, which are not exempt under § 86.090-9(g)(2), are capable of being modified to meet high-altitude standards.

(vi) If 90 percent or more of the engine family sales will be in California, a manufacturer may substitute emission-data vehicles selected by the California Air Resources Board criteria for the selections specified in paragraphs (b)(1) (i), (ii), and (iv) of this section.

(vii)(A) Vehicles of each evaporative emission family will be divided into evaporative emission control systems.

(B) The Administrator will select the vehicle expected to exhibit the highest evaporative emissions, from within each evaporative family to be certified, from among the vehicles represented by the exhaust emission-data selections for the engine family, unless evaporative testing has already been completed on the vehicle expected to exhibit the highest evaporative emissions for the evaporative family as part of another engine family's testing.

(C) If the vehicles selected in accordance with paragraph (b)(1)(vii)(B) of this section do not represent each evaporative emission control system then the Administrator will select the highest expected evaporative emission vehicle from within the unrepresented evaporative system.

(viii) For high-altitude evaporative emission compliance for each evaporative emission family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the one nonexempt vehicle previously selected under paragraphs (b)(1)(vii) (B) or (C) of this section which is expected to have the highest level of evaporative emissions when operated at high altitude or

(B) In lieu of testing vehicles according to paragraph (b)(1)(viii)(A) of this section, a manufacturer may provide a statement in its application for certification that based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(1) That all light-duty vehicles not exempt under § 86.090-8(h) comply with the emission standards at high altitude and

(2) That light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements, and that all light-duty trucks sold at low altitude, which are not exempt under § 86.090-9(g)(2), are capable of being modified to meet high-altitude standards.

(ix) Vehicles selected under paragraph (b)(1)(v)(A) of this section may be used to satisfy the requirements of (b)(1)(viii)(A) of this section.

(x) Light-duty trucks only: (A) The manufacturer may reconfigure any of the low-altitude emission-data vehicles to represent the vehicle configuration required to be tested at high altitude.

(B) The manufacturer is not required to test the reconfigured vehicle at low altitude.

(2) *Otto-cycle heavy-duty emission-data engines.* Paragraph (b)(2) of this section applies to Otto-cycle heavy-duty engines.

(i) [Reserved]

(ii) [Reserved]

(iii) The Administrator shall select a maximum of two engines within each engine family based upon features indicating that they may have the highest emission levels of the engines in the engine family as follows:

(A) The Administrator shall select one emission-data engine first based on the largest displacement within the engine family. Then within the largest displacement the Administrator shall select, in the order listed, highest fuel flow at the speed of maximum rated torque, the engine with the most advanced spark timing, no EGR or lowest EGR flow, and no air pump or lowest actual flow air pump.

(B) The Administrator shall select one additional engine, from within each engine family. The engine selected shall be the engine expected to exhibit the highest emissions of those engines remaining in the engine family. If all engines within the engine family are similar the Administrator may waive the requirements of this paragraph.

(iv) If the engines selected in accordance with paragraphs (b)(2) (ii) and (iii) of this section do not represent each engine displacement-exhaust emission control system combination, then one engine of each engine displacement-exhaust emission control system combination not represented shall be selected by the Administrator.

(v) Within an engine family/displacement/control system, the manufacturer may alter any emission-data engine (or other engine including current or previous model year emission-data vehicles and development engines provided they meet the emission-data engines protocol) to represent more than one selection under paragraphs (b)(2)(iii) of this section.

(3) *Diesel heavy-duty emission-data engines.* Paragraph (b)(3) of this section applies to diesel heavy-duty emission-data vehicles.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into groups based upon their exhaust emission control systems. One engine of each engine system combination shall be run for smoke emission data (diesel engines only) and gaseous emission data. Either the complete gaseous emission test or the complete smoke test may be conducted

first. Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected. If there are military engines with higher fuel rates than other engines in the same engine system combinations, then one military engine shall also be selected. The engine with the highest fuel feed per stroke will usually be selected.

(iii) The Administrator may select a maximum of one additional engine within each engine-system combination based upon features indicating that it may have the highest emission levels of the engines of that combination. In selecting this engine, the Administrator will consider such features as the injection system, fuel system, compression ratio, rated speed, rated horsepower, peak torque speed, and peak torque.

(iv) Within an engine family control system combination, the manufacturer may alter any emission-data engine (or other engine including current or previous model year emission-data vehicles and development engines provided they meet the emission-data engines' protocol) to represent more than one selection under paragraphs (b)(3) (ii) and (iii) of this section.

(c) *Durability data.* (1) *Light-duty vehicle durability-data vehicles.* Paragraph (c)(1) of this section applies to light-duty vehicle durability-data vehicles.

(i) A durability-data vehicle will be selected by the Administrator to represent each engine-system combination. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with that control-system combination in that engine family and will be designated by the Administrator as to transmission type, fuel system, inertia weight class, and test weight.

(ii) A manufacturer may elect to operate and test additional vehicles to represent any engine-system combination. The additional vehicles must be of the same engine displacement, transmission type, fuel system and inertia weight class as the vehicle selected for that engine-system combination in accordance with the provisions of paragraph (c)(1)(i) of this section. Notice of an intent to operate and test additional vehicles shall be given to the Administrator no later than 30 days following notification of the test fleet selection.

(2) *Light-duty trucks.* Paragraph (c)(2) of this section applies to vehicles, engines, subsystems, or components used to establish exhaust emission

deterioration factors for light-duty trucks.

(i) The manufacturer shall select the vehicles, engines, subsystems, or components to be used to determine exhaust emission deterioration factors for each engine-family control system combination. Whether vehicles, engines, subsystems, or components are used, they shall be selected so that their emissions deterioration characteristics may be expected to represent those of in-use vehicles, based on good engineering judgment.

(ii) [Reserved]

(3) *Heavy-duty engines.* Paragraph (c)(3) of this section applies to engines, subsystems, or components used to establish exhaust emission deterioration factors for heavy-duty engines.

(i) The manufacturer shall select the engines, subsystems, or components to be used to determine exhaust emission deterioration factors for each engine-family control system combination. Whether engines, subsystems, or components are used, they shall be selected so that their emissions deterioration characteristics may be expected to represent those of in-use engines, based on good engineering judgment.

(ii) [Reserved]

(d) For purposes of testing under § 86.084-26 (a)(9) or (b)(11), the Administrator may require additional emission-data vehicles (or emission-data engines) and durability-data vehicles (light-duty vehicles only) identical in all material respects to vehicles (or engines) selected in accordance with paragraphs (b) and (c) of this section, *provided* that the number of vehicles (or engines) selected shall not increase the size of either the emission-data fleet or the durability-data fleet by more than 20 percent or one vehicle (or engine), whichever is greater.

(e)(1) Any manufacturer whose projected sales for the model year in which certification is sought is less than:

(i) 2,000 Otto-cycle light-duty vehicles,

or

(ii) 2,000 diesel light-duty vehicles, or

(iii) 2,000 Otto-cycle light-duty trucks,

or

(iv) 2,000 diesel light-duty trucks, or

(v) 2,000 Otto-cycle heavy-duty

engines, or

(vi) 2,000 diesel heavy-duty engines, may request a reduction in the number of test vehicles (or engines) determined in accordance with the foregoing provisions of this section. The Administrator may agree to such lesser number as he determines would meet the objectives of this procedure.

(2) Any manufacturer may request to certify engine families with combined total sales of fewer than 10,000 light-duty vehicles, light-duty trucks, and heavy-duty engines utilizing assigned deterioration factors prescribed by the Administrator. The assigned deterioration factors shall be applied only to entire engine families.

(f) In lieu of testing an emission-data or durability-data vehicle (or engine) selected under paragraph (b) or (c) of this section, and submitting data therefore, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data and/or fuel evaporative emission data, as applicable on a similar vehicle (or engine) for which certification has previously been obtained or for which all applicable data required under § 86.090-23 has previously been submitted.

(g)(1) This paragraph applies to light-duty vehicles and light-duty trucks, but does not apply to the production vehicles selected under paragraph (h) of this section.

(2)(i) Where it is expected that more than 33 percent of a carline, within an engine-system combination will be equipped with an item (whether that item is standard equipment or an option), the full estimated weight of that item shall be included in the curb weight computation for each vehicle available with that option in that carline, within that engine-system combination.

(ii) Where it is expected that 33 percent or less of the carline, within an engine-system, will be equipped with an item of (whether that item is standard equipment or an option), no weight for that item will be added in computing curb weight for any vehicle in that carline, within that engine-system combination, unless that item is standard equipment on the vehicle.

(iii) In the case of mutually exclusive options, only the weight of the heavier option will be added in computing curb weight.

(iv) Optional equipment weighing less than 3 pounds per item need not be considered.

(3)(i) Where it is expected that more than 33 percent of a carline, within an engine-system combination will be equipped with an item of (whether that item is standard equipment or an option) that can reasonably be expected to influence emissions, then such items shall actually be installed (unless excluded under paragraph (g)(3)(ii) of this section) on all emission data and durability data vehicles of that carline, within that engine-system combination, on which the items are intended to be offered in production. Items that can

reasonably be expected to influence emissions are: air conditioning, power steering, power brakes and other items determined by the Administrator.

(ii) If the manufacturer determines by test data or engineering evaluation that the actual installation of the optional equipment required by paragraph (g)(3)(i) of this section does not affect the emissions or fuel economy values, the optional equipment need not be installed on the test vehicle.

(iii) The weight of the options shall be included in the design curb weight and also be represented in the weight of the test vehicles.

(iv) The engineering evaluation, including any test data, used to support the deletion of optional equipment from test vehicles, shall be maintained by the manufacturer and shall be made available to the Administrator upon request.

(4) Where it is expected that 33 percent or less of a carline, within an engine system combination will be equipped with an item of (whether that item is standard equipment or an option) that can reasonably be expected to influence emissions, that item shall not be installed on any emission data or durability data vehicles of that carline, within that engine-system combination, unless that item is standard equipment on the vehicle.

(h) Alternative Durability Program durability-data vehicles. This section applies to light-duty vehicle and light-duty truck durability-data vehicles selected under the Alternative Durability Program described in § 86.085-13.

(1) In order to update the durability data to be used to determine a deterioration factor for each engine family group, the Administrator will select durability-data vehicles from the manufacturer's production line. Production vehicles will be selected from each model year's production for those vehicles certified using the Alternative Durability Program procedures.

(i) The Administrator shall select the production durability-data vehicle designs from the designs that the manufacturer offers for sale. For each model year and for each engine family group, the Administrator may select production durability-data vehicle designs of equal number to the number of engine families within the engine family group, up to a maximum of three vehicles.

(ii) The production durability-data vehicles representing the designs selected in paragraph (h)(1)(i) of this section will be randomly selected from the manufacturer's production. The

Administrator will make these random selections unless the manufacturer (with prior approval of the Administrator) elects to make the random selections.

(iii) The manufacturer may select additional production durability-data vehicle designs from within the engine family group. The production durability-data vehicles representing these designs shall be randomly selected from the manufacturer's production in accordance with paragraph (h)(1)(ii) of this section.

(iv) For each production durability-data vehicle selected under paragraph (h)(1) of this section, the manufacturer shall provide to the Administrator (before the vehicle is tested or begins service accumulation) the vehicle identification number. Before the vehicle begins service accumulation the manufacturer shall also provide the Administrator with a description of the durability-data vehicle as specified by the Administrator.

(v) In lieu of testing a production durability-data vehicle selected under paragraph (h)(1) of this section, and submitting data therefrom, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data from a production vehicle of the same configuration for which all applicable data has previously been submitted.

(2) If, within an existing engine family group, a manufacturer requests to certify vehicles of a new design, engine family, emission control system, or with any other durability-related design difference, the Administrator will determine if the existing engine family group deterioration factor is appropriate for the new design. If the Administrator cannot make this determination or deems the deterioration factor not appropriate, the Administrator shall select preproduction durability-data vehicles under the provisions of paragraph (c) of this section. If vehicles are then certified using the new design, the Administrator may select production vehicles with the new design under the provisions of paragraph (h)(1) of this section.

(3) If a manufacturer requests to certify vehicles of a new design that the Administrator determines are a new engine family group, the Administrator shall select preproduction durability data vehicles under the provisions of paragraph (c) of this section. If vehicles are then certified using the new design, the Administrator may select production vehicles of that design under the provisions of paragraph (h)(1) of this section.

21. Section 86.090-25 of Subpart A is amended by revising paragraphs (b)(3), (d)(1)(ii), (e) (2) and (3), and (h) to read as follows:

§ 86.090-25 Maintenance.

\* \* \* \* \*

(b) \* \* \*

(3) For Otto-cycle light-duty vehicles, light-duty trucks and heavy duty engines, emission-related maintenance in addition to, or at shorter intervals than, the following will not be accepted as technologically necessary, except as provided in paragraph (b)(7) of this section.

(i)(A) The cleaning or replacement of light-duty vehicle or light-duty truck spark plugs at 30,000 miles of use and at 30,000 mile intervals thereafter.

(B) The cleaning or replacement of Otto-cycle heavy duty engine spark plugs at 25,000 miles (or 750 hours) of use and at 25,000 mile intervals (or 750-hour) intervals thereafter, for engines certified for use with unleaded fuel only.

\* \* \* \* \*

(d) \* \* \*

(1) \* \* \*

(ii) Readjustment of an Otto-cycle vehicle cold-start enrichment system may be performed if there is a problem of stalling.

\* \* \* \* \*

(e) \* \* \*

(2) Maintenance on light-duty truck emission-data vehicles selected under § 86.090-24(b)(1) (v) or (vii), and permitted to be tested for purposes of § 86.090-23(c)(1)(ii) under the provisions of § 86.090-24(b)(2), may be performed in conjunction with emission control system modifications at the low-mileage test point, and shall be performed in accordance with the maintenance instructions to be provided to the ultimate purchaser required under § 86.087-38.

(3) Maintenance on those light-duty truck emission-data vehicles selected under 86.090-24(b)(1)(v) which are not capable of being modified in the field for the purpose of complying with emissions standards at an altitude other than that intended by the original design, may be performed in conjunction with the emission control system modifications at the low-mileage test point, and shall be approved in advance by the Administrator.

\* \* \* \* \*

(h) All test data, maintenance reports, and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.090-23.

22. A new § 86.090-26 is added to Subpart A. to read as follows:

§ 86.090-26 Mileage and service accumulation; emission requirements.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles.

(2) The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV to this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.129, the manufacturer may elect to conduct the respective emission tests at higher loaded vehicle weight.

(3) Emission-data vehicles. Unless otherwise provided for in § 86.090-23(a), emission-data vehicles shall be operated and tested as follows:

(i) Otto-cycle. (A) The manufacturer shall determine, for engine family, the mileage at which the engine-system combination is stabilized for emission-data testing. The manufacturer shall maintain, and provide to the Administrator if requested, a record of the rationale used in making this determination. The manufacturer may elect to accumulate 4,000 miles on each test vehicle within an engine family without making a determination. Any vehicle used to represent emission-data vehicle selections under § 86.090-24(b)(1) shall be equipped with an engine and emission control system that has accumulated at least the mileage determined under this paragraph. Fuel economy data generated from certification vehicles selected in accordance with § 86.090-24(b)(1) with engine-system combinations that have accumulated more than 10,000 kilometers (6,200 miles) shall be factored in accordance with § 600.006-82(c). Complete exhaust and evaporative (if required) emission tests shall be conducted for each emission-data vehicle selection under § 86.090-24(b)(1). The Administrator may determine under § 86.090-24(f) that no testing is required.

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (v) or (viii) shall be conducted at the mileage at which the engine system combination is stabilized for emission testing under high-altitude conditions.

(C) Exhaust and evaporative emissions tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (i), (ii), (iii), (iv), or (vii)(B) shall be conducted at the mileage at which the engine-system

combination is stabilized for emission testing under low-altitude conditions.

(D) For each engine family, the manufacturer will either select one vehicle previously selected under § 86.090-24(b)(1) (i) through (iv) to be tested under high-altitude conditions or provide a statement in accordance with § 86.090-24(b)(1)(v). Vehicles shall meet emission standards under both low- and high-altitude conditions without manual adjustments or modifications. In addition, any emission control device used to conform with the emission standards under high-altitude conditions shall initially actuate (automatically) no higher than 4,000 feet above sea level.

(ii) Diesel. (A) The manufacturer shall determine, for each engine family, the mileage at which the engine-system combination is stabilized for emission-data testing. The manufacturer shall maintain, and provide to the Administrator if requested, a record of the rationale used in making this determination. The manufacturer may elect to accumulate 4,000 miles on each test vehicle within an engine family without making a determination. Any vehicle used to represent emission-data vehicle selections under § 86.090-24(b)(1) shall be equipped with an engine and emission control system that has accumulated at least the mileage determined under this paragraph. Fuel economy data generated from certification vehicles selected in accordance with § 86.090-24(b)(1) with engine-system combinations that have accumulated more than 10,000 kilometers (6,200 miles) shall be factored in accordance with § 600.006-82(c). Complete exhaust emission tests shall be conducted for each emission-data vehicle selection under § 86.090-24(b)(1). The Administrator may determine under § 86.090-24(f) that no testing is required.

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1)(v) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing under low-altitude conditions.

(C) Exhaust and evaporative emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (i) through (iv) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing under low-altitude conditions.

(D) For each engine family, the manufacturer will either select one vehicle previously selected under § 86.090-24(b)(1) (i) through (iv) to be tested under high-altitude conditions or provide a statement in accordance with

§ 86.090-24(b)(1)(v). Vehicles shall meet emission standards under both low- and high-altitude conditions without manual adjustments or modifications. In addition, any emission control device used to conform with the emission standards under high-altitude conditions shall initially actuate (automatically) no higher than 4,000 feet above sea level.

(4)(i) *Durability data vehicles.* (A) Unless otherwise provided for in § 86.090-23(a), each durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure.

(B) Complete exhaust emission tests shall be made at test point mileage intervals that the manufacturer determines.

(C) At a minimum, two complete exhaust emission tests shall be made. The first test shall be made at a distance not greater than 6,250 miles. The last shall be made at 50,000 miles.

(D) The mileage interval between test points must be of equal length except for the interval between zero miles and the first test, and any interval before or after testing conducted in conjunction with vehicle maintenance as specified in § 86.090-25(g)(2).

(ii) The manufacturer may, at its option, alter the durability-data vehicle at the selected test point to represent emission-data vehicle(s) within the same engine/system combination and perform emission tests on the altered vehicle. Upon completion of emission testing, the manufacturer may return the test vehicle to the durability-data vehicle configuration prior to the continuation of mileage accumulation.

(5)(i) All tests required by this subpart on emission-data vehicles shall be conducted at a mileage equal to or greater than the mileage the manufacturer determines under paragraph (a)(3) of this section.

(ii) All tests required by this subpart on durability-data vehicles shall be conducted within 250 miles of each of the test points.

(6)(i)(A) The manufacturer may conduct multiple tests at any test point at which the data are intended to be used in the deterioration factor. At each test point where multiple tests are conducted, the test results from all valid tests shall be averaged to determine the data point to be used in the deterioration factor calculation, except under paragraph (a)(6)(i)(B) of this section. The test results from emission tests performed before maintenance affecting emissions shall not be averaged with test results after the maintenance.

(B) The manufacturer is not required to average multiple tests if the manufacturer conducts no more than three tests at each test point and if the number of tests at each test point is equal. All test points must be treated the same for all exhaust pollutants.

(ii) The results of all emission testing shall be supplied to the Administrator. The manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) may be submitted weekly to the Administrator, but shall be air posted or delivered to the Administrator within 7 days after completion of the test. In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.090-23. Where the Administrator conducts a test on a durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(iii) The results of all emission tests shall be rounded, in accordance with ASTM E 29-87, to the number of decimal places contained in the applicable emission standard expressed to one additional significant figure.

(7) Whenever a manufacturer intends to operate and test a vehicle which may be used for emission or durability data, the manufacturer shall retain in its records all information concerning all emissions tests and maintenance, including vehicle alterations to represent other vehicle selections. For emission-data vehicles, this information shall be submitted, including the vehicle description and specification information required by the Administrator, to the Administrator following the emission-data test. For durability-data vehicles, this information shall be submitted following the 5,000-mile test.

(8) Once a manufacturer submits the information required in paragraphs (a)(7) of this section for a durability-data vehicle, the manufacturer shall continue to run the vehicle to 50,000 miles, and the data from the vehicle will be used in the calculations under § 86.090-28. Discontinuation of a durability-data vehicle shall be allowed only with the consent of the Administrator.

(9)(i) The Administrator may elect to operate and test any test vehicle during all or any part of the mileage accumulation and testing procedure. In such cases, the manufacturer shall provide the vehicle(s) to the

Administrator with all information necessary to conduct this testing.

(ii) The test procedures in §§ 86.106 through 86.145 will be followed by the Administrator. The Administrator will test the vehicles at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other vehicles of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification vehicle other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(11) This section does not apply to testing conducted to meet the requirements of § 86.090-23(b)(2).

(b)(1) Paragraph (b) of this section applies to light-duty trucks.

(2) There are three types of mileage or service accumulation applicable to light-duty trucks:

(i) Mileage or service accumulation on vehicles, engines, subsystems, or components selected by the manufacturer under § 86.090-24(c)(2)(i). The manufacturer determines the form and extent of this mileage or service accumulation, consistent with good engineering practice, and describes it in the application for certification.

(ii) Mileage accumulation of the duration selected by the manufacturer on emission-data vehicles selected under § 86.090-24(b)(1). The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV to this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.129, the manufacturer may elect to conduct the respective emission tests at the test weight corresponding to the higher loaded vehicle weight.

(iii) Service or mileage accumulation which may be part of the test

procedures used by the manufacturer to establish evaporative emission deterioration factors.

(3) Exhaust emission deterioration factors will be determined on the basis of the mileage or service accumulation described in paragraph (b)(2)(i) of this section and related testing, according to the manufacturer's procedures.

(4) Each emission-data vehicle shall be operated and tested as follows:

(i) *Otto-cycle*. (A) The manufacturer shall determine, for each engine family, the mileage at which the engine-system combination is stabilized for emission-data testing. The manufacturer shall maintain, and provide to the Administrator if requested, a record of the rationale used in making this determination. The manufacturer may elect to accumulate 4,000 miles on each test vehicle within an engine family without making a determination. Any vehicle used to represent emission-data vehicle selections under § 86.090-24(b)(1) shall be equipped with an engine and emission control system that has accumulated at least the mileage determined under this paragraph. Fuel economy data generated from certification vehicles selected in accordance with § 86.090-24(b)(1) with engine-system combinations that have accumulated more than 10,000 kilometers (6,200 miles) shall be factored in accordance with § 600.006-82(c). Complete exhaust emission tests shall be conducted for each emission-data vehicle selection under § 86.090-24(b)(1). The Administrator may determine under § 86.090-24(f) that no testing is required.

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (v) or (viii) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at 6,436 kilometers (4,000-miles) under high-altitude conditions.

(C) Exhaust and evaporative emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (ii), (iii), (iv)(A), or (vii)(B) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(D) If the manufacturer recommends adjustments or modifications in order to conform to emission standards at high altitude, such adjustments or modifications shall be made to the test vehicle selected under § 86.090-24(b)(1) (v) and (viii) (in accordance with the instructions to be provided to the ultimate purchaser) before being tested under high-altitude conditions

(ii) *Diesel*. (A) The manufacturer shall determine, for each engine family, the mileage at which the engine-system combination is stabilized for emission-data testing. The manufacturer shall maintain, and provide to the Administrator if requested, a record of the rationale used in making this determination. The manufacturer may elect to accumulate 4,000 miles on each test vehicle within an engine family without making a determination. Any vehicle used to represent emission-data vehicle selections under § 86.090-24(b)(1) shall be equipped with an engine and emission control system that has accumulated at least the mileage determined under this paragraph. Fuel economy data generated from certification vehicles selected in accordance with § 86.090-24(b)(1) with engine-system combinations that have accumulated more than 10,000 kilometers (6,200 miles) shall be factored in accordance with § 600.006-82(c). Complete exhaust emission tests shall be conducted for each emission-data vehicle selection under § 86.090-24(b)(1). The Administrator may determine under § 86.090-24(f) that no testing is required.

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1)(v) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(C) Exhaust and evaporative emission tests for emission-data vehicle(s) selected for testing under § 86.090-24(b)(1) (ii), (iii), and (iv) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(D) If the manufacturer recommends adjustments or modifications in order to conform to emission standards at high altitude, such adjustments or modifications shall be made to the test vehicle selected under § 86.090-24(b)(1) (v) and (viii) (in accordance with the instructions to be provided to the ultimate purchaser) before being tested under high-altitude conditions.

(iii) [Reserved]

(iv) All tests required by this subpart on emission-data vehicles shall be conducted at a mileage equal to or greater than the mileage the manufacturer determines under paragraph (b)(4) of this section.

(c)(1) Paragraph (c) of this section applies to heavy-duty engines.

(2) There are two types of service accumulation applicable to heavy-duty engines

(i) Service accumulation on engines, subsystems, or components selected by the manufacturer under § 86.088-24(c)(3)(i). The manufacturer determines the form and extent of this service accumulation, consistent with good engineering practice, and describes it in the application for certification.

(ii) Dynamometer service accumulation on emission-data engines selected under § 86.090-24(b) (2) or (3). The manufacturer determines the engine operating schedule to be used for dynamometer service accumulation, consistent with good engineering practice. A single engine operating schedule shall be used for all engines in an engine family-control system combination. Operating schedules may be different for different combinations.

(3) Exhaust emission deterioration factors will be determined on the basis of the service accumulation described in paragraph (b)(2)(i) of this section and related testing, according to the manufacturer's procedures.

(4) The manufacturer shall determine, for each engine family, the number of hours at which the engine system combination is stabilized for emission-data testing. The manufacturer shall maintain, and provide to the Administrator if requested a record of the rationale used in making this determination. The manufacturer may elect to accumulate 125 hours on each test engine within an engine family without making a determination. Any engine used to represent emission-data engine selections under § 86.090-24(b)(2) shall be equipped with an engine system combination that has accumulated at least the number of hours determined under this paragraph. Complete exhaust emission tests shall be conducted for each emission-data engine selection under § 86.090-24(b)(2). Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system. The Administrator may determine under § 86.090-24(f) that no testing is required.

(d)(1) Paragraph (d) of this section applies to both light-duty trucks and heavy-duty engines.

(2)(i) The results of all emission testing shall be supplied to the Administrator. The manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) may be



submitted weekly to the Administrator, but shall be air posted or delivered to the Administrator within 7 days after completion of the tests. In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.090-23. Where the Administrator conducts a test on a durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator. These test results shall be rounded, in accordance with ASTM E 29-67, to the number of decimal places contained in the applicable emission standard expressed to one additional significant figure.

(3) Whenever a manufacturer intends to operate and test a vehicle (or engine) which may be used for emission data, the manufacturer shall retain in its records all information concerning all emissions tests and maintenance, including vehicle (or engine) alterations to represent other vehicle (or engine) selections. This information shall be submitted, including the vehicle (or engine) description and specification information required by the Administrator, to the Administrator following the emission-data test.

(4) [Reserved]

(5) [Reserved]

(6) Emission testing of any type with respect to any certification vehicle or engine other than that specified in this subpart is not allowed except as such testing may be specifically authorized by the Administrator.

23. A new § 86.090-27 is added to Subpart A, to read as follows:

**§ 86.090-27 Special test procedures.**

(a) The Administrator may, on the basis of written application by a manufacturer, prescribe test procedures, other than those set forth in this part, for any light-duty vehicle, light-duty truck, heavy-duty engine, or heavy-duty vehicle which the Administrator determines is not susceptible to satisfactory testing by the procedures set forth in this part.

(b) If the manufacturer does not submit a written application for use of special test procedures but the Administrator determines that a light-duty vehicle, light-duty truck, heavy-duty engine, or heavy-duty vehicle is not susceptible to satisfactory testing by the procedures set forth in this part, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection in accordance with the provisions of § 86.090-22(c).

24. A new § 86.090-28 is added to Subpart A, to read as follows:

**§ 86.090-28 Compliance with emission standards.**

(a)(1) Paragraph (a) of this section applies to light-duty vehicles.

(2) The applicable exhaust and evaporative emission standards (and family particulate emission limits, as appropriate) of this subpart apply to the emissions of vehicles for their useful life.

(3) Since it is expected that emission control efficiency will change with mileage accumulation on the vehicle, the emission level of a vehicle which has accumulated 50,000 miles will be used as the basis for determining compliance with the standards (or family particulate emission limit, as appropriate).

(4) The procedure for determining compliance of a new motor vehicle with exhaust emission standards (or family particulate emission limit, as appropriate) is as follows, except where specified by paragraph (a)(7) of this section for the Alternative Durability Program:

(i) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust OMHCE (methanol-fueled vehicles) exhaust CO, exhaust NO<sub>x</sub>, and exhaust particulate (diesel vehicles) for each engine-system combination. A separate evaporative emission deterioration factor shall be determined for each evaporative emission family-evaporative emission control system combination from the testing conducted by the manufacturer (gasoline-fueled and methanol-fueled vehicles only).

(A) The applicable results to be used unless excluded by paragraph (a)(4)(i)(A)(4) of this section in determining the exhaust emission deterioration factors for each engine-system combination shall be:

(1) All valid exhaust emission data from the tests required under § 86.088-26(a)(4) except the zero-mile tests. This shall include the official test results, as determined in § 86.090-29 for all tests conducted on all durability-data vehicles of the combination selected under § 86.090-24(c) (including all vehicles elected to be operated by the manufacturer under § 86.090-24(c)(1)(ii)).

(2) All exhaust emission data from the tests conducted before and after the scheduled maintenance provided in § 86.088-25.

(3) All exhaust emission data from tests required by maintenance approved under § 86.088-25, in those cases where the Administrator conditioned his approval for the performance of such maintenance on the inclusion of such

data in the deterioration factor calculation.

(4) The manufacturer has the option of applying an outlier test point procedure to completed durability data within its certification testing program for a given model year. The outlier procedure will be specified by the Administrator. For any pollutant, durability-data test points that are identified as outliers shall not be included in the determination of deterioration factors if the manufacturer has elected this option. The manufacturer shall specify to the Administrator before the certification of the first engine family for that model year, if it intends to use the outlier procedure. The manufacturer may not change procedures after the first engine family of the model year is certified. Where the manufacturer chooses to apply both the outlier procedure and averaging (as allowed under § 86.088-26(a)(6)(i) to the same data set, the outlier procedure shall be completed prior to applying the averaging procedure.

(B) All applicable exhaust emission results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The data will be acceptable for use in the calculation of the deterioration factor only if the interpolated 4,000-mile and 50,000-mile points on this line are within the low-altitude standards provided in § 86.090-8. Exceptions to this where data are still acceptable are when a best fit straight line crosses an applicable standard but no data points exceeded the standard, or the best fit straight line crosses an applicable standard with a negative slope (the 4,000-mile interpolated point is higher than the 50,000-mile interpolated point) but the 50,000-mile actual data point is below the standard. A multiplicative exhaust emission deterioration factor shall be calculated for each engine-system combination as follows:

Factor = Exhaust emissions  
interpolated to 50,000 miles divided  
by exhaust emissions interpolated  
to 4,000 miles.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the deterioration factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29-67.

(C) An evaporative emissions deterioration factor (gasoline-fueled and

methanol-fueled vehicles only) shall be determined from the testing conducted as described in § 86.090-21(b)(4)(i), for each evaporative emission family- evaporative emission control system combination to indicate the evaporative emission level at 50,000 miles relative to the evaporative emission level at 4,000 miles as follows:

Factor =  $\frac{\text{Evaporative emission level at 50,000 miles} - \text{evaporative emission level at 4,000 miles}}{\text{evaporative emission level at 4,000 miles}}$

The factor shall be established to a minimum of two places to the right of the decimal.

(ii)(A) The official exhaust emission test results for each emission-data vehicle at the selected test point shall be multiplied by the appropriate deterioration factor: *Provided*, that if a deterioration factor as computed in paragraph (a)(4)(i)(B) of this section is less than one, that deterioration factor shall be one for the purposes of this paragraph.

(B) The official evaporative emission test results (gasoline-fueled and methanol-fueled vehicles only) for each evaporative emission-data vehicle at the selected test point shall be adjusted by addition of the appropriate deterioration factor: *Provided*, that if a deterioration factor as computed in paragraph (a)(4)(i)(C) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(iii) The emissions to compare with the standard (or the family particulate emission limit, as appropriate) shall be the adjusted emissions of paragraphs (a)(4)(ii)(A) and (B) of this section for each emission-data vehicle. Before any emission value is compared with the standard (or the family particulate emission limit, as appropriate), it shall be rounded, in accordance with ASTM E 29-67, to two significant figures. The rounded emission values may not exceed the standard (or the family particulate emission limit, as appropriate).

(iv) Every test vehicle of an engine family must comply with the exhaust emission standards (or the family particulate emission limit, as appropriate), as determined in paragraph (a)(4)(iii) of this section, before any vehicle in that family may be certified.

(v) Every test vehicle of an evaporative emission family must comply with the evaporative emission standard, as determined in paragraph (a)(4)(iii) of this section, before any vehicle in that family may be certified.

(5) If a manufacturer chooses to change the level of any family particulate emission limit(s) in the

particulate averaging program, compliance with the new limit(s) must be based upon existing certification data.

(6) If a manufacturer chooses to participate in the diesel particulate averaging program, the production-weighted average of the family particulate emission limits of all affected engine families must comply with the particulate standard in § 86.090-8(a)(1)(iv), or the composite particulate standard defined in § 86.088-2, as appropriate, at the end of the production year.

(7) The procedure to determine the compliance of new motor vehicles in the Alternative Durability Program (described in § 86.085-13) is the same as described in paragraphs (a)(4)(iii) through (a)(4)(v) of this section. For the engine families that are included in the Alternative Durability Program, the exhaust emission deterioration factors used to determine compliance shall be those that the Administrator has approved under § 86.085-13(c). The evaporative emission deterioration factor for each evaporative emission family shall be determined and applied according to paragraph (a)(4) of this section. The procedures to determine the minimum exhaust emissions deterioration factors required under § 86.085-13(d) are as follows:

(i) Separate deterioration factors shall be determined from the exhaust emission results of the durability-data vehicles for each engine family group. A separate factor shall be established for exhaust HC, exhaust CO, and exhaust NO<sub>x</sub> for each engine family group. The evaporative emission deterioration factor for each evaporative family will be determined and applied in accordance with paragraph (a)(4) of this section.

(ii) The deterioration factors for each engine family group shall be determined by the Administrator using historical durability data from as many as three previous model years. These data will consist of deterioration factors generated by durability-data vehicles representing certified engine families and of deterioration factors from vehicles selected under § 86.090-24(h). The Administrator shall determine how these data will be combined for each engine family group.

(A) The test results to be used in the calculation of each deterioration factor to be combined for each engine family group shall be those test results specified in paragraph (a)(4)(i)(A) of this section.

(B) For each durability-data vehicle selected under § 86.090-24(h), all applicable exhaust emissions results

shall be plotted as a function of the mileage on the system rounded to the nearest mile, and the best fit straight lines, fitted by method of least squares, shall be drawn through all these data points. The exhaust deterioration factor for each durability-data vehicle shall be calculated as specified in paragraph (a)(4)(i)(B) of this section.

(C) *Line crossing.* For the purposes of paragraph (a)(5) of this section, line crossing occurs when either of the interpolated 4,000- and 50,000-mile points of the best fit straight line exceeds the applicable emission standard and at least one applicable data point exceeds the standard.

(1) The Administrator will not accept for certification line-crossing data from preproduction durability-data vehicles selected under § 86.090-24(c), § 86.090-24 (h)(2), or (h)(3).

(2) The Administrator will not accept for certification line-crossing data from production durability-data vehicles selected under § 86.090-24(h)(1) unless the 4,000-mile test result multiplied by the engine family group deterioration factor does not exceed the applicable emission standards. The deterioration factors used for this purpose shall be those that were used in the certification of the production vehicle. Manufacturers may calculate this product immediately after the 4,000-mile test of the vehicle. If the product exceeds the applicable standards, the manufacturer may, with the approval of the Administrator, discontinue the vehicle and substitute a new vehicle. The manufacturer may continue the original vehicle, but the data will not be acceptable if line crossing occurs.

(b)(1) Paragraph (b) of this section applies to light-duty trucks.

(2) The exhaust and evaporative emission standards (and family emission limits, as appropriate) of § 86.090-9 apply to the emissions of vehicles for their useful life.

(3) Since emission control efficiency generally decreases with the accumulation of mileage on the vehicle, deterioration factors will be used in combination with emission-data vehicle test results as the basis for determining compliance with the standards (or family emission limits, as appropriate).

(4)(i) Paragraph (b)(4) of this section describes the procedure for determining compliance of a new vehicle with exhaust emission standards (or family emission limits, as appropriate), based on deterioration factors supplied by the manufacturers, except where specified by paragraph (b)(5) of this section for the Alternative Durability Program.

(ii) Separate exhaust emission deterioration factors, determined from tests of vehicles, engines, subsystems, or components conducted by the manufacturer, shall be supplied for each engine-system combination. Separate factors shall be established for transient HC, CO, and NO<sub>x</sub>, idle CO (vehicles equipped with Otto-cycle or methanol-fueled diesel engines only), and exhaust particulate (diesel vehicles only).

(iii) For transient HC, OMHCE (methanol-fueled vehicles), CO, and NO<sub>x</sub>, idle CO (vehicles equipped with Otto-cycle or methanol-fueled diesel engines only), and exhaust particulate (diesel vehicles), the official exhaust emission results for each emission-data vehicle at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph.

(iv) The emission values to compare with the standards (or family emission limits, as appropriate) shall be the adjusted emission values of paragraph (b)(4)(iii) of this section, rounded to the same number of significant figures as contained in the applicable standard in accordance with ASTM E 29-67, for each emission-data engine.

(5)(i) Paragraph (b)(5)(i) of this section applies only to manufacturers electing to participate in the particulate averaging program.

(A) If a manufacturer chooses to change the level of any family particulate emission limit(s), compliance with the new limit(s) must be based upon existing certification data.

(B) The production-weighted average of the family particulate emission limits of all applicable engine families, rounded to two significant figures in accordance with ASTM E 29-67, must comply with the particulate standards in § 86.090-9(a)(1)(iv) or (d)(1)(iv), or the composite particulate standard defined in § 86.085-2, as appropriate, at the end of the product year.

(ii) Paragraph (b)(5)(ii) of this section applies only to manufacturers electing to participate in the NO<sub>x</sub> averaging program.

(A) If a manufacturer chooses to change the level of any family NO<sub>x</sub> emission limit(s), compliance with the new limit(s) must be based upon existing certification data.

(B) The production-weighted average of the family NO<sub>x</sub> emission limits of all applicable engine families, rounded to two significant figures in accordance with ASTM E 29-67, must comply with the NO<sub>x</sub> emission standards of § 86.090-9(a)(1)(iii) (A) or (B), or of § 86.090-

9(d)(1)(iii) (A) or (B), or the composite NO<sub>x</sub> standard as defined in § 86.088-2, at the end of the product year.

(6) The procedure to determine the compliance of new motor vehicles in the Alternative Durability Program (described in § 86.085-13) is the same as described in paragraphs (b)(4)(iv), (b)(7)(iv) and (b)(8) of this section. For the engine families that are included in the Alternative Durability Program, the exhaust emission deterioration factors used to determine compliance shall be those that the Administrator has approved under § 86.085-13(c). The evaporative emission deterioration factor for each evaporative emission family shall be determined and applied according to paragraph (b)(7) of this section. The procedures to determine the minimum exhaust emissions deterioration factors required under § 86.085-13(d) are as follows:

(i) Separate deterioration factors shall be determined from the exhaust emission results of the durability-data vehicles for each engine family group. A separate factor shall be established for exhaust HC, exhaust CO, and exhaust NO<sub>x</sub> for each engine family group. The evaporative emission deterioration factor for each evaporative family will be determined and applied in accordance with paragraph (b)(6) of this section.

(ii) The deterioration factors for each engine family group shall be determined by the Administrator using historical durability data from as many as three previous model years. These data will consist of deterioration factors generated by durability-data vehicles representing certified engine families and of deterioration factors from vehicles selected under § 86.090-24(h). The Administrator shall determine how these data will be combined for each engine family group.

(A) The test results to be used in the calculations of each deterioration factor to be combined for each engine family group shall be those test results specified in paragraph (a)(4)(i)(A) of this section.

(B) For each durability-data vehicle selected under § 86.090-24(h), all applicable exhaust emission results shall be plotted as a function of the mileage on the system rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The exhaust deterioration factor for each durability-data vehicle shall be calculated as specified in paragraph (a)(4)(i)(B) of this section.

(C) *Line crossing.* For the purposes of paragraph (b)(5) of this section, line

crossing occurs when either of the interpolated 4,000- and 120,000-mile points of the best fit straight line exceeds the applicable emission standard and at least one applicable data point exceeds the standard.

(7) The Administrator will not accept for certification line-crossing data from preproduction durability-data vehicles selected under § 86.090-24(c)(1), or § 86.090-24 (h)(2) or (h)(3).

(2) The Administrator will not accept for certification line-crossing data from production durability-data vehicles selected under § 86.090-24(h)(1) unless the 4,000-mile test result multiplied by the engine family group deterioration factor does not exceed the applicable emission standard. The deterioration factors used for this purpose shall be those that were used in the certification of the production vehicle. Manufacturers may calculate this product immediately after the 4,000-mile test of the vehicle. If the product exceeds the applicable standard, the manufacturer may, with the approval of the Administrator, discontinue the vehicle and substitute a new vehicle. The manufacturer may continue the original vehicle, but the data will not be acceptable if line crossing occurs.

(7)(i) Paragraph (b)(7) of this section describes the procedure for determining compliance of a new vehicle with fuel evaporative emission standards. The procedure described here shall be used for all vehicles in all model years.

(ii) The manufacturer shall determine, based on testing described in § 86.090-21(b)(4)(i), and supply an evaporative emission deterioration factor for each evaporative emission family- evaporative emission control system combination. The factor shall be calculated by subtracting the emission level at the selected test point from the emission level at the useful life point.

(iii) The official evaporative emission test results for each evaporative emission-data vehicle at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(iv) The emission value to compare with the standards shall be the adjusted emission value of paragraph (b)(7)(iii) of this section rounded to two significant figures in accordance with ASTM E 29-67 for each evaporative emission-data vehicle.

(8) Every test vehicle of an engine family must comply with all applicable standards (and family emission limits, as appropriate), as determined in

paragraphs (b)(4)(iv) and (b)(7)(iv) of this section, before any vehicle in that family will be certified.

(c)(1) Paragraph (c) of this section applies to heavy-duty engines.

(2) The exhaust emission standards for Otto cycle engines in § 86.090-10 or for diesel engines in § 86.090-11 apply to the emissions of engines for their useful life.

(3) Since emission control efficiency generally decreases with the accumulation of service on the engine, deterioration factors will be used in combination with emission-data engine test results as the basis for determining compliance with the standards.

(4)(i) Paragraph (c)(4) of this section describes the procedure for determining compliance of an engine with emission standards (or family emission limits, as appropriate), based on deterioration factors supplied by the manufacturer.

(ii) Separate exhaust emission deterioration factors, determined from tests of engines, subsystems, or components conducted by the manufacturer, shall be supplied for each engine-system combination. For Otto-cycle engines, separate factors shall be established for transient HC (OMHCE for methanol-fueled vehicles), CO, and NO<sub>x</sub>; and idle CO, for those engines utilizing aftertreatment technology (e.g., catalytic converters). For diesel engines, separate factors shall be established for transient HC (OMHCE for methanol-fueled engines), CO, NO<sub>x</sub>, and exhaust particulate. For diesel smoke testing, separate factors shall also be established for the acceleration mode (designated as "A"), the lugging mode (designated as "B"), and peak opacity (designated as "C").

(iii)(A) Paragraph (c)(4)(iii)(A) of this section applies to Otto-cycle heavy-duty engines.

(1) *Otto-cycle heavy-duty engines not utilizing aftertreatment technology (e.g., catalytic converters)*. For transient HC (OMHCE), CO, and NO<sub>x</sub>, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(2) *Otto-cycle heavy-duty engines utilizing aftertreatment technology (e.g., catalytic converters)*. For transient HC (OMHCE), CO, and NO<sub>x</sub>, and for idle CO, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the

manufacturer is less than one, it shall be one for the purposes of this paragraph.

(B) Paragraph (c)(4)(iii)(B) of this section applies to diesel heavy-duty engines.

(1) *Diesel heavy-duty engines not utilizing aftertreatment technology (e.g., particulate traps)*. For transient HC (OMHCE), CO, NO<sub>x</sub>, and exhaust particulate, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(2) *Diesel heavy-duty engines utilizing aftertreatment technology (e.g., particulate traps)*. For transient HC (OMHCE), CO, NO<sub>x</sub>, and exhaust particulate, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph.

(3) *Diesel heavy duty engines only*. For acceleration smoke ("A"), lugging smoke ("B"), and peak smoke ("C"), the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(iv) The emission values to compare with the standards (or family emission limits, as appropriate) shall be the adjusted emission values of paragraph (c)(4)(iii) of this section, rounded to the same number of significant figures as contained in the applicable standard in accordance with ASTM E 29 67, for each emission data engine.

(5) [Reserved].

(6) [Reserved].

(7) Every test engine of an engine family must comply with all applicable standards (or family emission limits, as appropriate), as determined in paragraph (c)(4)(iv) of this section, before any engine in that family will be certified.

(d)(1) Paragraph (d) of this section applies to heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines.

(2) The applicable evaporative emission standard in § 86.090-10 or § 86.090-11 applies to the emissions of vehicles for their useful life.

(3)(i) For vehicles with a GVWR of up to 26,000 pounds, because it is expected that emission control efficiency will change during the useful life of the vehicle, an evaporative emission deterioration factor shall be determined from the testing described in § 86.090-23(b)(3) for each evaporative emission family-evaporative emission control system combination to indicate the evaporative emission control system deterioration during the useful life of the vehicle (minimum 50,000 miles). The factor shall be established to a minimum of two places to the right of the decimal.

(ii) For vehicles with a GVWR of greater than 26,000 pounds, because it is expected that emission control efficiency will change during the useful life of the vehicle, each manufacturer's statement as required in § 86.090-23(b)(4)(ii) shall include, in accordance with good engineering practice, consideration of control system deterioration.

(4) The evaporative emission test results, if any, shall be adjusted by the addition of the appropriate deterioration factor: *Provided*, that if the deterioration factor as computed in paragraph (d)(3) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(5) The emission level to compare with the standard shall be the adjusted emission level of paragraph (d)(4) of this section. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTM E 29-67, to two significant figures. The rounded emission values may not exceed the standard.

(6) Every test vehicle of an evaporative emission family must comply with the evaporative emission standard, as determined in paragraph (d)(5) of this section, before any vehicle in that family may be certified.

25. Section 86.091-28 is amended by revising paragraphs (a)(4)(i) introductory text, (a)(4)(i)(C), (a)(4)(ii)(B), (b)(2), (b)(3), (b)(4), (b)(8), (c)(2), (c)(4), (c)(7), (d)(1), and (d)(2), to read as follows:

**§ 86.091-28 Compliance with emission standards.**

(a) \* \* \*

(4) \* \* \*

(i) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust OMHCE (methanol-fueled vehicles) exhaust CO, exhaust NO<sub>x</sub>, and exhaust particulate (diesel vehicles) for each engine-system combination. A

separate evaporative emission deterioration factor shall be determined for each evaporative emission family- evaporative emission control system combination from the testing conducted by the manufacturer (gasoline-fueled and methanol-fueled vehicles only).

(C) An evaporative emissions deterioration factor (gasoline-fueled and methanol-fueled vehicles only) shall be determined from the testing conducted as described in § 86.090-21(b)(4)(i), for each evaporative emission family- evaporative emission control system combination to indicate the evaporative emission level at 50,000 miles relative to the evaporative emission level at 4,000 miles as follows:

$$\text{Factor} = \text{Evaporative emission level at 50,000 miles} - \text{evaporative emission level at 4,000 miles.}$$

The factor shall be established to a minimum of two places to the right of the decimal.

(ii) The official evaporative emission test results (gasoline-fueled and methanol-fueled vehicles only) for each evaporative emission-data vehicle at the selected test point shall be adjusted by addition of the appropriate deterioration factor: *Provided*, that if a deterioration factor as computed in paragraph (a)(4)(i)(C) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(2) The exhaust and evaporative emission standards (and family emission limits, as appropriate) of § 86.091-9 apply to the emissions of vehicles for their useful life.

(3) Since emission control efficiency generally decreases with the accumulation of mileage on the vehicle, deterioration factors will be used in combination with emission-data vehicle test results as the basis for determining compliance with the standards (or family emission limits, as appropriate).

(4)(i) Paragraph (b)(4) of this section describes the procedure for determining compliance of a new vehicle with exhaust emission standards (or family emission limits, as appropriate), based on deterioration factors supplied by the manufacturers, except where specified by paragraph (b)(5) of this section for the Alternative Durability Program.

(ii) Separate exhaust emission deterioration factors, determined from tests of vehicles, engines, subsystems, or components conducted by the manufacturer, shall be supplied for each engine-system combination. Separate factors shall be established for transient

HC (OMHCE for methanol-fuel), CO, and NO<sub>x</sub>, idle CO (vehicles equipped with Otto-cycle or methanol-fueled diesel engines only), and exhaust particulate (diesel vehicles only).

(iii) For transient HC (OMHCE for methanol-fuel), CO, and NO<sub>x</sub>, idle CO (vehicles equipped with Otto-cycle or methanol-fueled diesel engines only), and exhaust particulate (diesel vehicles), the official exhaust emission results for each emission-data vehicle at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph.

(iv) The emission values to compare with the standards (or family emission limits, as appropriate) shall be the adjusted emission values of paragraph (b)(4)(iii) of this section rounded to two significant figures in accordance with ASTM E 29-67 for each emission-data engine.

(8) Every test vehicle of an engine family must comply with all applicable standards (and family emission limits, as appropriate), as determined in paragraphs (b)(4)(iv) and (b)(7)(iv) of this section, before any vehicle in that family will be certified.

(2) The exhaust emission standards (or family emission limits, as appropriate) for Otto-cycle engines in § 86.090-10 or for diesel engines in § 86.091-11 apply to the emissions of engines for their useful life.

(4)(i) Paragraph (c)(4) of this section describes the procedure for determining compliance of an engine with emission standards (or family emission limits, as appropriate), based on deterioration factors supplied by the manufacturer.

(ii) Separate exhaust emission deterioration factors, determined from tests of engines, subsystems, or components conducted by the manufacturer, shall be supplied for each engine-system combination. For Otto-cycle engines, separate factors shall be established for transient HC (OMHCE), CO, and NO<sub>x</sub>; and idle CO, for those engines utilizing aftertreatment technology (e.g., catalytic converters). For diesel engines, separate factors shall be established for transient HC (OMHCE), CO, NO<sub>x</sub>, and exhaust particulate. For diesel smoke testing, separate factors shall also be established for the acceleration mode (designated as "A"), the lugging mode

(designated as "B"), and peak opacity (designated as "C").

(iii)(A) Paragraph (c)(4)(iii)(A) of this section applies to Otto-cycle heavy-duty engines.

(1) *Otto-cycle heavy-duty engines not utilizing aftertreatment technology (e.g., catalytic converters).* For transient HC (OMHCE), CO, and NO<sub>x</sub>, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(2) *Otto-cycle heavy-duty engines utilizing aftertreatment technology (e.g., catalytic converters).* For transient HC (OMHCE), CO, and NO<sub>x</sub>, and for idle CO, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph.

(B) Paragraph (c)(4)(iii)(B) of this section applies to diesel heavy-duty engines.

(1) *Diesel heavy-duty engines not utilizing aftertreatment technology (e.g., particulate traps).* For transient HC (OMHCE), CO, NO<sub>x</sub>, and exhaust particulate, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph.

(2) *Diesel heavy-duty engines utilizing aftertreatment technology (e.g., particulate traps).* For transient HC (OMHCE), CO, NO<sub>x</sub>, and exhaust particulate, the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph.

(3) *Diesel heavy-duty engines only.* For acceleration smoke ("A"), lugging smoke ("B"), and peak smoke ("C"), the official exhaust emission results for each emission-data engine at the selected test point shall be adjusted by the addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall

be zero for the purposes of this paragraph.

(iv) The emission values to compare with the standards (or family emission limits, as appropriate) shall be the adjusted emission values of paragraph (c)(4)(iii) of this section, rounded to the same number of significant figures as contained in the applicable standard in accordance with ASTM E 29-67, for each emission-data engine.

(7) Every test engine of an engine family must comply with all applicable standards (or family emission limits, as appropriate), as determined in paragraph (c)(4)(iv) of this section, before any engine in that family will be certified.

(d)(1) Paragraph (d) of this section applies to heavy-duty vehicles equipped with gasoline-fueled or methanol-fueled engines.

(2) The applicable evaporative emission standard in § 86.091-10 or § 86.091-11 applies to the emissions of vehicles for their useful life.

26. A new § 86.090-29 is added to Subpart A, to read as follows:

**§ 86.090-29 Testing by the Administrator.**

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The Administrator may require that any one or more of the test vehicles be submitted to him, at such place or places as he may designate, for the purposes of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data for the vehicle at the prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards (or family emission limits, as appropriate).

(ii) Whenever the Administrator does not conduct a test on a test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that point: *Provided*, that if the Administrator makes a determination based on testing under paragraph (a)(2)

of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, and *further provided*, that if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provisions of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information. If the manufacturer conducts more than one test on a vehicle, as authorized under § 86.088-26 (a)(3)(i)(A) or (b)(4)(i)(A), the data from the last test in that series of tests on that vehicle will constitute the official data.

(iii)(A)(1) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission data vehicle or engine which the Administrator has determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.090-22(e)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.090-22(e)(3)(i) prior to the performance of any tests to determine whether such vehicle or engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.090-23(c)(1). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the engine before it accumulated any dynamometer service, all other parameters being identically adjusted for the purpose of the comparison. The Administrator, in making or specifying such adjustments, will consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use light-duty vehicles or light-duty trucks. In determining likelihood, the Administrator will consider factors such as, but not limited to, the effect of the adjustment on vehicle performance characteristics and surveillance information from similar in-use vehicles.

(2) For those vehicles or engine parameters which the Administrator has

not determined to be subject to adjustment during certification and Selective Enforcement Audit testing in accordance with § 86.090-22(e)(1), the emission-data vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.090-35 (a)(1)(iii)(D) or (a)(2)(iii)(D)) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle will be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle will be used as an emission-data vehicle.

(B) If the Administrator determines that the test data developed on an emission-data vehicle under paragraph (a)(3)(i) of this section would cause that vehicle to fail due to excessive 4,000-mile emissions or by application of the appropriate deterioration factor, then the following procedure shall be observed:

(1) The manufacturer may request a retest. Before the retest, those vehicle or engine parameters which the Administrator has not determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.090-22(e)(1) may be readjusted to manufacturer's specification, if these adjustments were made incorrectly prior to the first test. The Administrator may adjust or cause to be adjusted any parameter which the Administrator has determined to be subject to adjustment to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.090-22(e)(3)(i). Other maintenance or repairs may be performed in accordance with § 86.088-25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a)(2) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (a)(3)(iii)(A) and (B) of this section. If the

(ii) Whenever the Administrator does not conduct a test on an evaporative emission family-system combination, the manufacturer's test data will be accepted as the official data: *Provided*, that if the Administrator makes a determination, based on testing under paragraph (c)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, and further provided, that if the Administrator has reasonable basis to believe that any test data, analyses, or other information submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept those data, analyses, etc., as the official data pending retesting or submission of further information.

27. Section 86.091-29 of Subpart A is amended by revising paragraphs (a)(3)(i), (b)(3)(i), and (c)(1), to read as follows:

**§ 86.091-29 Testing by the Administrator.**

(a) \* \* \*

(3)(i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data for the vehicle at the prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards (or family emission limits, as appropriate).

\* \* \* \* \*

(b) \* \* \*

(3)(i) Whenever the Administrator conducts a test on a test engine the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine at that prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards (or family emission limits, as appropriate).

\* \* \* \* \*

(c)(1) Paragraph (c) of this section applies to gasoline-fueled and methanol-fueled heavy-duty vehicles.

\* \* \* \* \*

28. A new section 86.090-30 is added to Subpart A, to read as follows:

**§ 86.090-30 Certification.**

(a)(1)(i) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.078-7(c), and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meet(s) the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraphs (a)(1)(ii) and (c) of this section.

(ii) Gasoline-fueled and methanol-fueled heavy-duty vehicles. If, after a review of the statement(s) of compliance submitted by the manufacturer under § 86.090-23(b)(4) and any other pertinent data or information, the Administrator determines that the requirements of the Act and this subpart have been met, he will issue one certificate of conformity per manufacturer with respect to the evaporative emission family(s) covered by such statement(s) except in cases covered by paragraph (c) of this section.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary or appropriate to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part.

(3)(i) One such certificate will be issued for each engine family. For gasoline-fueled and methanol-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family evaporative emission family combination.

(A) *Light-duty vehicles.* Each certificate will certify compliance with no more than one set of standards (or family emission limits, as appropriate).

(B) *Light-duty trucks.* Each certificate will certify compliance with no more than one set of standards (or family emission limits, as appropriate), except for low-altitude standards and high-altitude standards. The certificate shall state that it covers vehicles sold or delivered to an ultimate purchaser for principal use at a designated high-altitude location only if the vehicle conforms in all material respects to the design specifications that apply to those vehicles described in the application for certification at high altitude.

(ii) For gasoline-fueled and methanol-fueled heavy-duty vehicles, one such certificate will be issued for each manufacturer and will certify compliance for those vehicles previously identified in that manufacturer's

statement(s) of compliance as required in § 86.090-23(b)(4) (i) and (ii).

(iii) For diesel light-duty vehicles and light-duty trucks included in the particulate averaging program, the manufacturer may at any time during production elect to change the level of any family particulate emission limit by demonstrating compliance with the new limit as described in §§ 86.090-28(a)(6) and 86.090-28(b)(5)(i). New certificates issued under this paragraph will be applicable only for vehicles produced subsequent to the date of issuance.

(iv) For light-duty trucks included in the NO<sub>x</sub> averaging program, the manufacturer may at any time during production elect to change the level of any family NO<sub>x</sub> emission limit by demonstrating compliance with the new limit as described in § 86.090-28(b)(5)(ii). New certificates issued under this paragraph will be applicable only for vehicles produced subsequent to the day of issue.

(4)(i) The adjustment or modification of any light-duty truck in accordance with instructions provided by the manufacturer for the altitude where the vehicle is principally used will not be considered a violation of section 203(a)(3) of the Clean Air Act.

(ii) A violation of section 203(a)(1) of the Clean Air Act occurs when a manufacturer sells or delivers to an ultimate purchaser any light-duty vehicle or light-duty truck, subject to the regulations under the Act, under any of the conditions specified in the remainder of this paragraph.

(A) When a light-duty vehicle or light-duty truck is not configured to meet high-altitude requirements:

(1) At a designated high-altitude location, unless such manufacturer has reason to believe that such vehicle will not be sold to an ultimate purchaser for principal use at a designated high-altitude location; or

(2) At a location other than a designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle will be sold to an ultimate purchaser for principal use at a designated high-altitude location.

(B) When a light-duty vehicle is not configured to meet low-altitude requirements, as provided in § 86.087-8(i):

(1) At a designated low-altitude location, unless such manufacturer has reason to believe that such vehicle will not be sold to an ultimate purchaser for principal use at a designated low-altitude location; or

(2) At a location other than a designated low-altitude location, when such manufacturer has reason to believe

manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(b)(1) Paragraph (b) of this section applies to heavy-duty engines.

(2) The Administrator may require that any one or more of the test engines be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test engine the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine at that prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards (or family emission limits, as appropriate).

(ii) Whenever the Administrator does not conduct a test on a test engine at a test point, the manufacturer's test data will be accepted as the official data for that test point: *Provided*, that if the Administrator makes a determination based on testing under paragraph (b)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, *and further provided*, that if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii)(A)(1) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission-data engine which the Administrator has determined to be subject to adjustment for certification testing in accordance with § 86.090-22(e)(1), to any setting within the physically adjustable range of that parameter, as

determined by the Administrator in accordance with § 86.090-22(e)(3)(i), prior to the performance of any tests to determine whether such engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.090-23(c)(2). The Administrator, in making or specifying such adjustments, may consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use heavy-duty engines. In determining likelihood, the Administrator may consider factors such as, but not limited to, the effect of the adjustment on engine performance characteristics and surveillance information from similar in-use engines.

(2) For those engine parameters which the Administrator has not determined to be subject to adjustment for certification testing in accordance with § 86.090-22(e)(1), the emission-data engine presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer specifications to be shown on the engine label (see § 86.090-35(a)(3)(iii)) as specified in the application for certification. If the Administrator determines that an engine is not within such tolerances, the engine shall be adjusted at the facility designated by the Administrator prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the engine shall be used as an emission-data engine.

(B) If the Administrator determines that the test data developed under paragraph (b)(3)(iii)(A) of this section would cause the emission-data engine to fail due to excessive 125-hour emission values or by the application of the appropriate deterioration factor, then the following procedure shall be observed:

(1) The manufacturer may request a retest. Before the retest, those engine parameters which the Administrator has not determined to be subject to adjustment for certification testing in accordance with § 86.090-22(e)(1) may be readjusted to the manufacturer's specifications, if these adjustments were made incorrectly prior to the first test. The Administrator may adjust or cause to be adjusted any parameter which the Administrator has determined to be subject to adjustment in accordance with § 86.090-22(e)(3)(i). However, if the idle speed parameter is one which the Administrator has determined to be

subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the engine before it accumulated any dynamometer service, all other parameters being identically adjusted for the purpose of the comparison. Other maintenance or repairs may be performed in accordance with § 86.088-25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The engine will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data engine.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (b)(2) of this section to enable the Administrator to determine whether an emission-data engine would fail, the manufacturer may request a retest in accordance with the provisions of paragraph (b)(3)(iii)(B) (1) and (2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the engine from the test premises.

(c)(1) Paragraph (c) of this section applies to gasoline-fueled and methanol-fueled heavy-duty vehicles.

(2) The Administrator may require that any one or more of the evaporative emission family-system combinations included in the manufacturer's statement(s) of compliance be installed on an appropriate vehicle and such vehicle be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on an evaporative emission family-system combination the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the evaporative emission family-system combination and the manufacturer's data, analyses, etc., shall not be used in determining compliance with emission standards.



that such motor vehicle will be sold to an ultimate purchaser for principal use at a designated low-altitude location.

(iii) A manufacturer shall be deemed to have reason to believe that a light-duty vehicle that has been exempted from compliance with emission standards at high altitude, or a light-duty truck which is not configured to meet high-altitude requirements, will not be sold to an ultimate purchaser for principal use at a designated high-altitude location if the manufacturer has informed its dealers and field representatives about the terms of these high-altitude regulations, has not caused the improper sale itself, and has taken reasonable action which shall include, but not be limited to, either paragraph (a)(4)(iii) (A) or (B), and (a)(4)(iii)(C) of this section:

(A) Requiring dealers in designated high-altitude locations to submit written statements to the manufacturer signed by the ultimate purchaser that a vehicle which is not configured to meet high-altitude requirements will not be used principally at a designated high-altitude location; requiring dealers in counties contiguous to designated high-altitude locations to submit written statements to the manufacturer, signed by the ultimate purchaser who represents to the dealer in the normal course of business that he or she resides in a designated high-altitude location, that a vehicle which is not configured to meet high-altitude requirements will not be used principally at a designated high-altitude location; and for each sale or delivery of fleets of ten or more such vehicles in a high-altitude location or in counties contiguous to high-altitude locations, requiring either the selling dealer or the delivering dealer to submit written statements to the manufacturer, signed by the ultimate purchaser who represents to the dealer in the normal course of business that he or she resides in a designated high-altitude location, that a vehicle which is not configured to meet high-altitude requirements will not be used principally at a designated high-altitude location. In addition, the manufacturer will make available to EPA, upon reasonable written request (but not more frequently than quarterly, unless EPA has demonstrated that it has substantial reason to believe that an improperly configured vehicle has been sold), sales, warranty, or other information pertaining to sales of vehicles by the dealers described above maintained by the manufacturer in the normal course of business relating to the altitude configuration of vehicles and the locations of ultimate purchasers; or

(B) Implementing a system which monitors factory orders of low-altitude vehicles by high-altitude dealers, or through other means, identifies dealers that may have sold or delivered a vehicle not configured to meet the high-altitude requirements to an ultimate purchaser for principal use at a designated high-altitude location; and making such information available to EPA upon reasonable written request (but not more frequently than quarterly, unless EPA has demonstrated that it has substantial reason to believe that an improperly configured vehicle has been sold); and

(C) Within a reasonable time after receiving written notice from EPA or a state or local government agency that a dealer may have improperly sold or delivered a vehicle not configured to meet the high-altitude requirements to an ultimate purchaser residing in a designated high-altitude location, or based on information obtained pursuant to paragraph (a)(4)(iii) of this section that a dealer may have improperly sold or delivered a significant number of such vehicles to ultimate purchasers so residing, reminding the dealer in writing of the requirements of these regulations, and, where appropriate, warning the dealer that sale by the dealer of vehicles not configured to meet high-altitude requirements may be contrary to the terms of its franchise agreement with the manufacturer and the dealer certification requirements of § 85.2108 of this chapter.

(iv) A manufacturer shall be deemed to have reason to believe that a light-duty vehicle which has been exempted from compliance with emission standards at low-altitude, as provided in § 86.090 8(i), will not be sold to an ultimate purchaser for principal use at a designated low-altitude location if the manufacturer has informed its dealers and field representatives about the terms of these high-altitude regulations, has not caused the improper sale itself, and has taken reasonable action which shall include, but not be limited to, either paragraph (a)(4)(iv) (A) or (B), and (a)(4)(iv)(C) of this section:

(A) Requiring dealers in designated low-altitude locations to submit written statements to the manufacturer signed by the ultimate purchaser that a vehicle which is not configured to meet low-altitude requirements will not be used principally at a designated low-altitude location; requiring dealers in counties contiguous to designated low-altitude locations to submit written statements to the manufacturer, signed by the ultimate purchaser who represents to the dealer in the normal course of

business that he or she resides in a designated low-altitude location, that a vehicle which is not configured to meet low-altitude requirements will not be used principally at a designated low-altitude location; and for each sale or delivery of fleets of ten or more such vehicles in a low-altitude location or in counties contiguous to low-altitude locations, requiring either the selling dealer or the delivering dealer to submit written statements to the manufacturer, signed by the ultimate purchaser who represents to the dealer in the normal course of business that he or she resides in a designated low-altitude location, that a vehicle which is not configured to meet low-altitude requirements will not be used principally at a designated low-altitude location. In addition, the manufacturer will make available to EPA, upon reasonable written request (but not more frequently than quarterly, unless EPA has demonstrated that it has substantial reason to believe that an improperly configured vehicle has been sold), sales, warranty, or other information pertaining to sales of vehicles by the dealers described above maintained by the manufacturer in the normal course of business relating to the altitude configuration of vehicles and the locations of ultimate purchasers; or

(B) Implementing a system which monitors factory orders of high-altitude vehicles by low-altitude dealers, or through other means, identifies dealers that may have sold or delivered a vehicle not configured to meet the low-altitude requirements to an ultimate purchaser for principal use at a designated low-altitude location; and making such information available to EPA upon reasonable written request (but not more frequently than quarterly, unless EPA has demonstrated that it has substantial reason to believe that an improperly configured vehicle has been sold); and

(C) Within a reasonable time after receiving written notice from EPA or a state or local government agency that a dealer may have improperly sold or delivered a vehicle not configured to meet the low-altitude requirements to an ultimate purchaser residing in a designated low-altitude location, or based on information obtained pursuant to paragraph (a)(4)(iv) of this section that a dealer may have improperly sold or delivered a significant number of such vehicles to ultimate purchasers so residing, reminding the dealer in writing of the requirements of these regulations, and where appropriate, warning the dealer that sale by the dealer of vehicles not configured to meet low-altitude requirements may be contrary to the

terms of its franchise agreement with the manufacturer and the dealer certification requirements of § 85.2108 of this chapter.

(5)(i) For the purpose of paragraph (a) of this section, a "designated high-altitude location" is any county which has substantially all of its area located above 1,219 meters (4,000 feet) and:

(A) Requested an extension past the attainment date of December 31, 1982, for compliance with either the National Ambient Air Quality Standards for carbon monoxide or ozone, as indicated in Part 52 (Approval and Promulgation of Implementation Plans) of this title; or

(B) Is the same state as a county designated as a high-altitude location according to paragraph (a)(5)(i)(A) of this section.

(ii) The designated high-altitude locations defined in paragraph (a)(5)(i) of this section are listed below:

#### State of Colorado

Adams	Kit Carson
Alamosa	Lake
Arapahoe	La Plata
Archuleta	Larimer
Boulder	Las Animas
Chaffee	Lincoln
Cheyenne	Mesa
Clear Creek	Mineral
Conejos	Moffat
Costilla	Montezuma
Crowley	Montrose
Custer	Morgan
Delta	Otero
Denver	Ouray
Dolores	Park
Douglas	Pitkin
Eagle	Pueblo
Elbert	Rio Blanco
El Paso	Rio Grande
Fremont	Routt
Garfield	Saguache
Gilpin	San Juan
Grand	San Miguel
Gunnison	Summit
Hinsdale	Teller
Huerfano	Washington
Jackson	Weld
Jefferson	

#### State of Nevada

Carson City	Lyon
Douglas	Mineral
Elko	Nye
Esmeralda	Pershing
Eureka	Storey
Humboldt	Washoe
Lander	White Pine
Lincoln	

#### State of New Mexico

Bernalillo	McKinley
Catron	Santa Fe
Colfax	Otero
Curry	Rio Arriba
Sandoval	Roosevelt
De Baca	Sandoval
Grant	San Juan
Mora	San Miguel
Guadalupe	Sierra
Harding	Socorro
Hidalgo	Taos
Lincoln	Torrance
Los Alamos	Union
Luna	Valencia

#### State of Utah

Beaver	Morgan
Box Elder	Piute
Cache	Rich
Carbon	Salt Lake
Daggett	San Juan
Davis	Sanpete
Duchesne	Sevier
Emery	Summit
Garfield	Tooele
Grand	Uintah
Iron	Utah
Juab	Wasatch
Kane	Wayne
Millard	Weber

(iii) For the purpose of paragraph (a) of this section, a "designated low-altitude location" is any county which has substantially all of its area located below 1,219 meters (4,000 feet).

(iv) The designated low-altitude locations so defined include all counties in the United States which are not listed in either paragraph (a)(5)(ii) of this section or in the list below:

#### State of Arizona

Apache	Navajo
Cochise	Yavapai
Coconino	

#### State of Idaho

Bannock	Franklin
Bear Lake	Fremont
Bingham	Jefferson
Blaine	Lemhi
Bonneville	Madison
Butte	Minidoka
Camas	Oneida
Caribou	Power
Cassia	Teton
Clark	Valley
Custer	

#### State of Montana

Beaverhead	Meagher
Deer Lodge	Park
Gallatin	Powell
Jefferson	Silver Bow
Judith Basin	Wheatland
Madison	

#### State of Nebraska

Banner	Kimball
Cheyenne	Sioux

#### State of Oregon

Harney	Lake
Klamath	

#### State of Texas

Jeff Davis	Parmer
Hudspeth	

#### State of Wyoming

Albany	Natrona
Campbell	Niobrara
Carbon	Park
Converse	Platte
Fremont	Sublette
Goshen	Sweetwater
Hot Springs	Teton
Johnson	Uinta
Laramie	Washakie
Lincoln	Weston

(6) Catalyst-equipped vehicles, otherwise covered by a certificate, which are driven outside the United

States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalyts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of the certificate unless included in a catalyst control program operated by a manufacturer or a United States Government agency and approved by the Administrator.

(7) For incomplete light-duty trucks, a certificate covers only those new motor vehicles which, when completed by having the primary load-carrying device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in § 86.090-21(d).

(8) For heavy-duty engines, a certificate covers only those new motor vehicle engines installed in heavy-duty vehicles which conform to the minimum gross vehicle weight rating, curb weight, or frontal area limitations for heavy-duty vehicles described in § 86.082-2.

(9) For incomplete gasoline-fueled and methanol-fueled heavy-duty vehicles a certificate covers only those new motor vehicles which, when completed, conform to the nominal maximum fuel tank capacity limitations as described in the application for certification as required in § 86.090-21(e).

(10) For diesel light-duty vehicles and diesel light-duty truck families which are included in a particulate averaging program, the manufacturer's production-weighted average of the particulate emission limits of all engine families in a participating class or classes shall not exceed the applicable diesel particulate standard, or the composite particulate standard defined in § 86.090-2, as appropriate, at the end of the model year, as determined in accordance with 40 CFR Part 86. The certificate shall be void *ab initio* for those vehicles causing any exceedance of the particulate standard.

(11) For light-duty truck families which are included in the NO<sub>x</sub> averaging program, the manufacturer's production weighted average of the NO<sub>x</sub> emission limits of all such engine families shall not exceed the applicable light-duty truck NO<sub>x</sub> standard, or the composite NO<sub>x</sub> standard defined in § 86.088-2, as appropriate, at the end of the model year, as determined in accordance with 40 CFR Part 86. The certificate shall be void *ab initio* for those vehicles causing any exceedance of the NO<sub>x</sub> standard.

(b)(1) The Administrator will determine whether a vehicle (or engine) covered by the application complies

family represented by a test engine(s) determined not in compliance with applicable standards:

(i) Request a hearing under § 86.078-6; or

(ii) Delete from the application for certification the engines represented by the failing test engine. (Engines so deleted may be included in a later request for certification under § 86.079-32.) The Administrator may then select in place of each failing engine an alternative engine chosen in accordance with selection criteria employed in selecting the engine that failed; or

(iii) Modify the test engine and demonstrate by testing that it meets applicable standards. Another engine which is in all material respects the same as the first engine, as modified, may then be operated and tested in accordance with applicable test procedures.

(6) If the manufacturer does not request a hearing or present the required data under paragraph (b)(4) or (b)(5) of this section (as applicable), the Administrator will deny certification.

(c)(1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) or engine(s) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto or otherwise circumvents the intent of the Act, or of this part with respect to such vehicle (or engine);

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.078-7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or buildup into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine) which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in paragraph (c)(iii)(C) of this section;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above;

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as

defined in § 86.078-7(c)) in examining any of the items listed in paragraph (c)(1)(iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraph (c)(1) (i), (ii), (iii), or (iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void *ab initio*.

(4) In any case in which certification of a vehicle (or engine) is proposed to be withheld, denied, revoked, or suspended under paragraph (c)(1) (iii) or (iv) of this section, and in which the Administrator has presented to the manufacturer involved, reasonable evidence that a violation of § 86.078-7(c) in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding, denial, revocation, or suspension of certification under either paragraph (c)(1) (iii) or (iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.078-6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by the certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct as makes the certification invalid *ab initio*.

(6) The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Administrator under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.078-6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

(d)(1) *For light duty vehicles.* Notwithstanding the fact that any

vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied the opportunity to conduct activities related to entry and access as authorized in § 86.606 of this part and in a warrant or court order presented to the manufacturer or the party in charge of a facility in question; or

(vi) EPA Enforcement Officers are unable to conduct activities related to entry and access or to obtain "reasonable assistance" as authorized in § 86.606 of this part because a manufacturer has located its facility in a foreign jurisdiction where local law prohibits those activities; or

(vii) The manufacturer refuses to or in fact does not comply with § 86.604(a), 86.605, 86.607, 86.608, or 86.610.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraph (d)(1) (i), (ii), or (vii) of this section where the refusal is caused by conditions and circumstances outside the control of the manufacturer which render it impossible to comply with those requirements.

(3) The sanction of suspending a certificate may be imposed for the reasons in paragraph (d)(1) (iii), (iv), or (v) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d)(1)(v) of this section and in which the Administrator has

with applicable standards (or family emission limits, as appropriate) by observing the following relationships:

(i) *Light-duty vehicles.* (A) The durability-data vehicle(s) selected under § 86.090-24(c)(1)(i) shall represent all vehicles of the same engine-system combination.

(B) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(ii) through (iv) shall represent all vehicles of the same engine-system combination as applicable.

(C) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(vii) (A) and (B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(ii) *Light-duty trucks.* (A) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(ii), shall represent all vehicles of the same engine-system combination as applicable.

(B) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(vii) (A) and (B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(C) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(v) shall represent all vehicles of the same engine-system combination as applicable.

(D) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(viii) shall represent all vehicles of the same evaporative control system within the evaporative emission family, as applicable.

(iii) *Heavy duty engines.* (A) An Otto-cycle emission-data test engine selected under § 86.090-24(b)(2)(iv) shall represent all engines in the same family of the same engine displacement-exhaust emission control system combination.

(B) An Otto-cycle emission-data test engine selected under § 86.090-24(b)(2)(iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A diesel emission-data test engine selected under § 86.090-24(b)(3)(ii) shall represent all engines in the same engine system combination.

(D) A diesel emission-data test engine selected under § 86.090-24(b)(3)(iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(iv) *Gasoline-fueled and methanol-fueled heavy-duty vehicles.* A statement of compliance submitted under § 86.090-23(b)(4) (i) or (ii) shall represent all vehicles in the same evaporative emission family-evaporative emission control system combination.

(2) The Administrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) belonging to an engine family or engine combination (as applicable), all of which comply with all applicable standards (or family emission limits, as appropriate).

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.090-29, data or information derived from any inspection carried out under § 86.078-7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards (or family emission limits, as appropriate), he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at its option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not in compliance with all applicable standards (or family emission limits, as appropriate) for which it was tested:

(i) Request a hearing under § 86.078-6; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration as applicable) which failed, from his application;

(A) If the failed vehicle was tested for compliance with exhaust emission standards (or family emission limits, as appropriate) only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(B) If the failed vehicle was tested for compliance with both exhaust and evaporative emission standards: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle which will be tested for

compliance with both exhaust and evaporative emission standards. If one vehicle cannot be selected in accordance with the selection criteria employed in selecting the failed vehicle, then two vehicles may be selected (*i.e.*, one vehicle to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicle selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from the application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards (or family emission limits, as appropriate) for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.090-24(b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards (or family emission limits, as appropriate) only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards (or family emission limits, as appropriate); or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards (or family emission limits, as appropriate) for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration, as applicable) to the failed vehicle, to be operated and tested for compliance with the applicable standards (or family emission limits, as appropriate) for which the failed vehicle was originally tested.

(5) For heavy-duty engines the manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine

presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, if the manufacturer wishes to contend that, although the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under paragraph (d)(1)(v) of this section, the manufacturer shall have the burden of establishing the contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.614; and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

(7) Any voiding of a certificate of conformity under paragraph (d)(4) of this section will be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.614.

(e) *For light-duty trucks and heavy-duty engines.* (1) Notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle or engine configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.1003; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.1003; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.1009; or

(iv) The manufacturer renders inaccurate any test data submitted pursuant to § 86.1009; or

(v) Any EPA Enforcement Officer is denied the opportunity to conduct activities related to entry and access as authorized in § 86.1006 of this part and in a warrant or court order presented to the manufacturer or the party in charge of a facility in question; or

(vi) EPA Enforcement Officers are unable to conduct activities related to entry and access as authorized in § 86.1006 of this part because a manufacturer has located a facility in a foreign jurisdiction where local law prohibits those activities; or

(vii) The manufacturer refuses to or in fact does not comply with the

requirements of §§ 86.1004(a), 86.1005, 86.1007, 86.1008, 86.1010, 86.1011, or 86.1013.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (e)(1) (i), (ii), or (vii) of this section where such refusal or denial is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturers to adequately plan for and provide the equipment and personnel needed to conduct tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanction of suspending a certificate may be imposed for the reasons outlined in paragraph (e)(1) (iii), (iv), or (v) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a light-duty truck or heavy-duty engine is proposed to be suspended under paragraph (e)(1)(v) of this section and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.1006 in fact occurred, if the manufacturer wishes to contend that, although the violation occurred, the vehicle or engine configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under paragraph (e)(1)(v) of this section, he shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (e)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing

conducted in accordance with § 86.1014, and

(ii) Not apply to vehicles or engines no longer in the hands of the manufacturer.

(7) Any voiding of a certificate of conformity under paragraph (e)(4) of this section shall be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.1014.

29. Section 86.091-30 of Subpart A is amended by revising paragraphs (a)(1)(ii), (a)(3)(i), (a)(3)(ii), (a)(9), (b)(1), (b)(3), (b)(4) introductory text, (b)(4)(ii)(A), (b)(4)(iii), (b)(4)(iv), (d)(1) through (d)(6) and adding (d)(7) to read as follows:

**§ 86.091-30 Certification.**

(a) \* \* \*

(1) \* \* \*

(ii) *Gasoline-fueled and methanol-fueled heavy-duty vehicles.* If, after a review of the statement(s) of compliance submitted by the manufacturer under § 86.091-23(b)(4) and any other pertinent data or information, the Administrator determines that the requirements of the Act and this subpart have been met, he will issue one certificate of conformity per manufacturer with respect to the evaporative emission family(s) covered by such statement(s) except in cases covered by paragraph (c) of this section.

\* \* \* \* \*

(3)(i) One such certificate will be issued for each engine family. For gasoline-fueled and methanol fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family evaporative emission family combination.

(A) *Light-duty vehicles.* Each certificate will certify compliance with no more than one set of standards (or family emission limits, as appropriate).

(B) *Light-duty trucks.* Each certificate will certify compliance with no more than one set of standards (or family emission limits, as appropriate), except for low-altitude standards and high altitude standards. The certificate shall state that it covers vehicles sold or delivered to an ultimate purchaser for principal use at a designated high-altitude location only if the vehicle conforms in all material respects to the design specifications that apply to those vehicles described in the application for certification at high altitude.

(ii) For gasoline-fueled and methanol fueled heavy-duty vehicles, one such certificate will be issued for each manufacturer and will certify compliance for those vehicles previously identified in that manufacturer's

statement(s) of compliance as required in § 86.091-23(b)(4) (i) and (ii).

(9) For incomplete gasoline-fueled and methanol-fueled heavy-duty vehicles a certificate covers only those new motor vehicles which, when completed, conform to the nominal maximum fuel tank capacity limitations as described in the application for certification as required in § 86.091-21(e).

(b)(1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards (or family emission limits, as appropriate) by observing the following relationships:

(i) *Light-duty vehicles.* (A) The durability data vehicle(s) selected under § 86.090-24(c)(1)(i) shall represent all vehicles of the same engine system combination.

(B) The emission data vehicle(s) selected under § 86.090-24(b)(1) (ii) through (iv) shall represent all vehicles of the same engine-system combination as applicable.

(C) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(vii) (A) and (B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(ii) *Light-duty trucks.* (A) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(ii), shall represent all vehicles of the same engine-system combination as applicable.

(B) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(vii) (A) and (B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(C) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(v) shall represent all vehicles of the same engine-system combination as applicable.

(D) The emission-data vehicle(s) selected under § 86.090-24(b)(1)(viii) shall represent all vehicles of the same evaporative control system within the evaporative emission family, as applicable.

(iii) *Heavy-duty engines.* (A) An Otto-cycle emission-data test engine selected under § 86.090-24(b)(2)(iv) shall represent all engines in the same family of the same engine displacement-exhaust emission control system combination.

(B) An Otto-cycle emission-data test engine selected under § 86.090-24(b)(2)(iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A diesel emission data test engine selected under § 86.090-24(b)(3)(ii) shall represent all engines in the same engine-system combination.

(D) A diesel emission-data test engine selected under § 86.090-24(b)(3)(iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(iv) *Gasoline-fueled and methanol-fueled heavy-duty vehicles.* A statement of compliance submitted under § 86.091-23(b)(4) (i) or (ii) shall represent all vehicles in the same evaporative emission family-evaporative emission control system combination.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.091-29, data or information derived from any inspection carried out under § 86.078-7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards (or family emission limits, as appropriate), he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at its option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not in compliance with all applicable standards (or family emission limits, as appropriate) for which it was tested:

(ii) \* \* \*

(A) If the failed vehicle was tested for compliance with exhaust emission standards (or family emission limits, as appropriate) only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(iii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from the application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards (or family emission limits, as appropriate) for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.090-24(b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards (or family emission limits, as appropriate) only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards (or family emission limits, as appropriate); or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards (or family emission limits, as appropriate) for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration, as applicable) to the failed vehicle, to be operated and tested for compliance with the applicable standards (or family emission limits, as appropriate) for which the failed vehicle was originally tested.

(d) \* \* \*

(1) \* \* \*

(v) Any EPA Enforcement Officer is denied the opportunity to conduct activities related to entry and access as authorized in § 86.606 of this part and in a warrant or court order presented to the manufacturer or the party in charge of a facility in question; or

(vi) EPA Enforcement Officers are unable to conduct activities related to entry and access or to obtain "reasonable assistance" as authorized in § 86.606 of this part because a manufacturer has located its facility in a foreign jurisdiction where local law prohibits those activities; or

(vii) The manufacturer refuses to or in fact does not comply with §§ 86.604(a), 86.605, 86.607, 86.608, or 86.610.

(2) The sanction of suspending a certificate may not be imposed for the

reasons in paragraph (d)(1)(i), (ii), or (vii) of this section where the refusal is caused by conditions and circumstances outside the control of the manufacturer which render it impossible to comply with those requirements.

(3) The sanction of suspending a certificate may be imposed for the reasons in paragraph (d)(1)(iii), (iv), or (v) of this section only when the infraction is substantial.

\* \* \* \* \*

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d)(1)(v) of this section and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, if the manufacturer wishes to contend that, although the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under paragraph (d)(1)(v) of this section, the manufacturer shall have the burden of establishing the contention to the satisfaction of the Administrator.

(6) \* \* \*

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.614; and

\* \* \* \* \*

(7) Any voiding of a certificate of conformity under paragraph (d)(4) of this section will be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.614.

\* \* \* \* \*

30. A new § 86.090-35 is added to Subpart A, to read as follows:

**§ 86.090-35 Labeling.**

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards (and family emission limits, as appropriate) of this subpart, shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.090-30(a).

(1) *Light-duty vehicles.* (i) A permanent, legible label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle in such a manner that it

cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicles Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches), engine family identification and evaporative family identification;

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards (or family emission limits, as appropriate), including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tune-up and what accessories (e.g., air conditioner), if any, should be in operation;

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light duty vehicles;

(F) For vehicles which are part of the diesel particulate averaging program, the family particulate emission limit to which the vehicle is certified;

(G) For vehicles that have been exempted from compliance with the emission standard at high altitude, as specified in § 86.087-8(h);

(1) A highlighted statement (e.g., underscored or boldface letters) that the vehicle is certified to applicable emission standards at low altitude only;

(2) A statement that the vehicle's unsatisfactory performance under high-altitude conditions makes it unsuitable for principal use at high altitude, and

(3) A statement that the emission performance warranty provisions of 40 CRF Part 85, Subpart V do not apply when the vehicle is tested at high altitude, and

(H) For vehicles that have been exempted from compliance with the emission standards at low altitude, as specified in § 86.087-8(i),

(1) A highlighted statement (e.g., underscored or boldface letters) that the vehicle is certified to applicable

emission standards at high altitude only, and

(2) A statement that the emission performance warranty provisions of 40 CFR Part 85, Subpart V do not apply when the vehicle is tested at low altitude.

(2) *Light-duty trucks.* (i) A legible, permanent label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label.

(A) The label heading: Important Vehicle Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards (or family emission limits, as appropriate), including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer.

(E) For vehicles which are part of the diesel particulate averaging program, the family particulate emission limit to which the vehicle is certified;

(F) For vehicles that have been exempted from compliance with the emission standard at high altitude, as specified in § 86.087-8(h);

(1) A highlighted statement (e.g., underscored or boldface letters) that the vehicle is certified to applicable emission standards at low altitude only;

(2) A statement that the vehicle's unsatisfactory performance under high-altitude conditions makes it unsuitable for principal use at high altitude, and

(3) A statement that the emission performance warranty provisions of 40 CRF Part 85, Subpart V do not apply when the vehicle is tested at high altitude, and

(H) For vehicles that have been exempted from compliance with the emission standards at low altitude, as specified in § 86.087-8(i),

(1) A highlighted statement (e.g., underscored or boldface letters) that the vehicle is certified to applicable

emission standards at high altitude only, and

(2) A statement that the emission performance warranty provisions of 40 CFR Part 85, Subpart V do not apply when the vehicle is tested at low altitude.

(2) *Light-duty trucks.* (i) A legible, permanent label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

provisions of § 86.090-21(f), the prominent statement: "This vehicle has been certified to meet U.S. EPA standards for a useful-life period of \_\_\_\_ years or \_\_\_\_ miles of operation, whichever occurs first. This vehicle's actual life may vary depending on its service application." The manufacturer may alter this statement only to express the assigned alternate useful life in terms other than years of miles (e.g., hours, or miles only);

(G) A statement, if applicable, that the adjustments or modifications indicated on the label are necessary to ensure emission control compliance at the altitude specified;

(H) A statement, if applicable, that the high-altitude vehicle was designated or modified for principal use at high altitude. This statement must be affixed by the manufacturer at the time of assembly or by any dealer who performs the high altitude modification or adjustment prior to sale to an ultimate purchaser;

(I) For vehicles that have been exempted from compliance with the high-altitude emission standards, as specified in § 86.090-9(g)(2).

(7) A highlighted statement (e.g., underscored or boldface letters) that the vehicle is certified to applicable emission standards at low altitude only,

(2) A statement that the vehicle's unsatisfactory performance under high-altitude conditions makes it unsuitable for principal use at high altitude, and

(3) A statement that the emission performance warranty provisions of 40 CFR Part 85, Subpart I do not apply when the vehicle is tested at high altitude; and

(J) For vehicles which are included in the diesel particulate averaging program, the family particulate emission limit to which the vehicle is certified.

(K) For vehicles which are included in the light-duty truck NO<sub>x</sub> averaging program, the family NO<sub>x</sub> emission limit to which the vehicle is certified.

(3) *Heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Important Engine Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family and model designations;

(D) Date of engine manufacture (month and year). The manufacturer may, in lieu of including the date of manufacture on the engine label, maintain a record of the engine manufacture dates. The manufacturer shall provide the date of manufacture records to the Administrator upon request;

(E) Engine specifications and adjustments as recommended by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) For Otto-cycle engines the label should include the idle speed, ignition timing, and the idle air fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash;

(G) For diesel engines the label should include the advertised hp at rpm, fuel rate at advertised hp in mm<sup>3</sup>/stroke, valve lash, initial injection timing, and idle speed;

(H) The prominent statement: "This engine conforms to U.S. EPA regulations applicable to 19\_\_\_\_ Model Year New Heavy-Duty Engines."

(I) If the manufacturer is provided with an alternate useful-life period under the provisions of § 86.090-21(f), the prominent statement: "This engine has been certified to meet U.S. EPA standards for a useful-life period of \_\_\_\_ miles or \_\_\_\_ hours of operation, whichever occurs first. This engine's actual life may vary depending on its service application." The manufacturer may alter this statement only to express the assigned alternate useful life in terms other than miles or hours (e.g., years, or hours only);

(J) For diesel engines. The prominent statement: "This engine has a primary intended service application as a \_\_\_\_-heavy-duty engine." (The primary intended service applications are light, medium, and heavy, as defined in § 86.085-2);

(K) For Otto-cycle engines. One of the following statements, as applicable:

(1) For engines certified to the emission standards under § 86.090-10(a)(1)(i) or § 86.090-10(a)(1)(iii), the statement: "This engine is certified for use in all heavy-duty vehicles."

(2) For gasoline-fueled engines certified under the provisions of § 86.090-10(a)(3)(i), the statement: "This engine is certified for use in all heavy-

duty vehicles under the special provision of 40 CFR 86.090-10(a)(3)(i)."

(3) For engines certified to the emission standards of § 86.090-10(a)(1)(ii) or § 86.090-10(a)(1)(iv), the statement: "This engine is certified for use only in heavy-duty vehicles with a gross vehicle weight rating above 14,000 lbs."

(iv) The label may be made up of one or more pieces: *Provided*, that all pieces are permanently attached to the same engine or vehicle part as applicable.

(4)(i) *Gasoline-fueled and methanol-fueled heavy-duty vehicles.* A permanent, legible label shall be affixed in a readily visible position in the engine compartment. If such vehicles do not have an engine compartment, the label required in paragraphs (a)(4) and (g)(1) of this section shall be affixed in a readily visible position on the operator's enclosure or on the engine.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicles Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Evaporative family identification;

(D) The maximum nominal fuel tank capacity (in gallons) for which the evaporative control system is certified; and

(E) One of the following, as appropriate:

(1) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to gasoline-fueled heavy-duty vehicles.

(2) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to methanol-fueled heavy-duty vehicles.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and



satisfactory maintenance of the vehicle (or engine).

(c)(1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards (or family emission limits, as appropriate) of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 40 CFR 567.4(b), the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

(i) The Heading: "Vehicle Emission Control Information."

(ii)(A) For light duty vehicles, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 19— Model Year New Motor Vehicles."

(B) For light-duty trucks. (1) The statement: "This vehicle conforms to U.S. EPA Regulations Applicable to 19— Model Year New Light-Duty Trucks."

(2) If the manufacturer is provided an alternate useful-life period under the provisions of § 86.090-21(f), the prominent statement: "This vehicle has been certified to meet U.S. EPA standards for a useful-life period of \_\_\_ years or \_\_\_ miles of operation, whichever occurs first. This vehicle's actual life may vary depending on its service application." The manufacturer may alter this statement only to express the assigned alternate useful life in terms other than years or miles (e.g., hours, or miles only).

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as non-catalyst-equipped: "NON-CATALYST."

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program for which approval has been given by the Administrator: "CATALYST-APPROVED FOR IMPORT."

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST."

(2) In lieu of selecting either of the labeling options of paragraph (c)(1) of this section, the manufacturer may add the information required by paragraph (c)(1)(iii) of this section to the label

required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c)(1)(iii) of this section.

(d) Incomplete light-duty trucks or incomplete heavy-duty vehicles optionally certified as light-duty trucks shall have the following prominent statement printed on the label required by paragraph (a)(2) of this section in lieu of the statement required by paragraph (a)(2)(iii)(E) of this section: "This vehicle conforms to U.S. EPA regulations applicable to 19— Model Year New Light-Duty Trucks when completed at a maximum curb weight of \_\_\_ pounds or at a maximum gross vehicle weight rating of \_\_\_ pounds or with a maximum frontal area of \_\_\_ square feet."

(e) Incomplete heavy duty vehicles having a gross vehicle weight rating of 8,500 pounds or less shall have one of the following statements printed on the label required by paragraph (a)(3) of this section in lieu of the statement required by paragraph (a)(3)(iii)(H) of this section: "This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines when installed in a vehicle completed at a curb weight of more than 6,000 pounds or with a frontal area of greater than 45 square feet."

(f) The manufacturer of any incomplete light-duty vehicle or light-duty truck shall notify the purchaser of such vehicle of any curb weight, frontal areas, or gross vehicle weight rating limitations affecting the emission certificate applicable to that vehicle. This notification shall be transmitted in a manner consistent with National Highway Traffic Safety Administration Safety notification requirements published in 49 CFR Part 568.

(g)(1)(i) Incomplete gasoline-fueled heavy-duty vehicles shall have the following prominent statement printed on the label required in paragraph (a)(4) of this section: "(Manufacturer's corporate name) has determined that this vehicle conforms to U.S. EPA regulations applicable to 19— Model Year New Gasoline-Fueled Heavy-Duty Vehicles when completed with a nominal fuel tank capacity not to exceed \_\_\_ gallons. Persons wishing to add fuel tank capacity beyond the above maximum must submit a written statement to the Administrator that the hydrocarbon storage system has been upgraded according to the requirements of 40 CFR 86.090-35(g)(2)."

(ii) Incomplete methanol-fueled heavy-duty vehicles shall have the following prominent statement printed on the label required in paragraph (a)(4) of this section: "(Manufacturer's

corporate name) has determined that this vehicle conforms to U.S. EPA regulations applicable to 19— Model Year New Methanol-Fueled Heavy-Duty Vehicles when completed with a nominal fuel tank capacity not to exceed \_\_\_ gallons. Persons wishing to add fuel tank capacity beyond the above maximum must submit a written statement to the Administrator that the hydrocarbon storage system has been upgraded according to the requirements of 40 CFR 86.090-35(g)(2)."

(2) Persons wishing to add fuel tank capacity beyond the maximum specified on the label required in paragraph (g)(1) of this section shall:

(i) Increase the amount of fuel tank vapor storage material according to the following function:

$$Cap_r = Cap_i \left( \frac{T. Vol.}{Max. Vol.} \right)$$

Where:

Cap<sub>r</sub> = final amount of fuel tank vapor storage material, grams.

Cap<sub>i</sub> = initial amount of fuel tank vapor storage material, grams.

T. Vol. = total fuel tank volume of completed vehicle, gallons.

Max. Vol. = maximum fuel tank volume as specified on the label required in paragraph (g)(1) of this section, gallons.

(ii) Use, if applicable, hosing for fuel vapor routing which is at least as impermeable to hydrocarbon vapors as that used by the primary manufacturer.

(iii) Use vapor storage material with the same absorptive characteristics as that used by the primary manufacturer.

(iv) Connect, if applicable, any new hydrocarbon storage device to the existing hydrocarbon storage device in series such that the original hydrocarbon storage device is situated between the fuel tank and the new hydrocarbon storage device. The original hydrocarbon storage device shall be sealed such that vapors cannot reach the atmosphere. The elevation of the original hydrocarbon storage device shall be equal to or lower than the new hydrocarbon storage device.

(v) Submit a written statement to the Administrator that paragraphs (g)(2)(i) through (g)(2)(iv) of this section have been complied with.

(3) If applicable, the Administrator will send a return letter verifying the receipt of the written statement required in paragraph (g)(2)(v) of this section.

(h)(1) Light-duty trucks and heavy duty engines for which nonconformance penalties are to be paid in accordance with § 86.1113-87(b) shall have the following information printed on the label required in paragraph (a) of this

section or on a separate permanent legible label in the English language and located in proximity to the label required in paragraph (a) of this section. The manufacturer shall begin labeling production engines or vehicles within 10 days after the completion of the PCA.

(i) The statement: "The manufacturer of this engine/vehicle will pay a penalty to be allowed to introduce it into commerce at an emission level higher than the applicable emission standard. The compliance level (or new emission standard) for this engine/vehicle is \_\_\_\_\_." (The manufacturer shall insert the applicable pollutant and compliance level calculated in accordance with § 86.1112-87(a).)

(2) If a manufacturer introduces an engine or vehicle into commerce prior to the compliance level determination of § 86.1112-87(a), it shall provide the engine or vehicle owner with a label as described above to be affixed in a location in proximity to the label required in paragraph (a) of this section within 30 days of the completion of the PCA.

31. Section 86.091-35 of Subpart A is amended by revising paragraphs (a) introductory text, (a)(1)(iii) (C) and (D), (a)(2)(iii)(D), (a)(3)(iii) (F) and (G), (a)(3)(iii) (J) and (K), (a)(4)(i), (a)(4)(iii)(E), (c)(1), (g)(1), and adding paragraph (h) to read as follows:

§ 86.091-35 Labelling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards (and family emission limits, as appropriate) of this subpart, shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.091-30(a).

- (1) \* \* \*
(iii) \* \* \*

(C) Engine displacement (in cubic inches), engine family identification and evaporative family identification;

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards (or family emission limits, as appropriate), including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the

proper transmission position during tune-up and what accessories (e.g., air conditioner), if any, should be in operation;

\* \* \* \* \*

(2) \* \* \*

(iii) \* \* \*

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards (or family emission limits, as appropriate), including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tune-up and what accessories (e.g., air conditioner), if any, should be in operation. If adjustments or modifications to the vehicle are necessary to insure compliance with emission standards (or family emission limits, as appropriate) at either high or low altitude, the manufacturer shall either include the instructions for such adjustments on the label, or indicate on the label where instructions for such adjustments may be found. The label shall indicate whether the engine tune-up or adjustment specifications are applicable to high altitude, low altitude or both;

\* \* \* \* \*

(3) \* \* \*

(iii) \* \* \*

(F) For Otto-cycle engines the label should include the idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash;

(G) For diesel engines the label should include the advertised hp at rpm, fuel rate at advertised hp in mm³/stroke, valve lash, initial injection timing, and idle speed;

\* \* \* \* \*

(J) For diesel engines. The prominent statement: "This engine has a primary intended service application as a \_\_\_\_\_heavy-duty engine." (The primary intended service applications are light, medium, and heavy, as defined in § 86.085-2);

(K) For Otto-cycle engines. One of the following statements, as applicable:

(1) For engines certified to the emission standards of § 86.091-10(a)(1)(i) or § 86.091-10(a)(1)(iii), the statement: "This engine is certified for use in all heavy-duty vehicles."

(2) For gasoline-fueled engines certified under the provisions of § 86.091-10(a)(3)(i), the statement: "This engine is certified for use in all heavy-duty vehicles under the special provision of 40 CFR 86.091-10(a)(3)(i)."

(3) For engines certified to the emission standards of § 86.091-10(a)(1)(ii) or § 86.091-10(a)(1)(iv), the statement: "This engine is certified for use only in heavy-duty vehicles with a gross vehicle weight rating above 14,000 lbs."

\* \* \* \* \*

(4)(i) Gasoline-fueled and methanol-fueled heavy-duty vehicles. A permanent, legible label shall be affixed in a readily visible position in the engine compartment. If such vehicles do not have an engine compartment, the label required in paragraphs (a)(4) and (g)(1) of this section shall be affixed in a readily visible position on the operator's enclosure or on the engine.

\* \* \* \* \*

(iii) \* \* \*

(E) One of the following, as appropriate:

(1) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to gasoline-fueled heavy-duty vehicles.

(2) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to methanol-fueled heavy-duty vehicles.

\* \* \* \* \*

(c)(1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards (or family emission limits, as appropriate) of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 40 CFR 567.4(b), the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

\* \* \* \* \*

(g)(1)(i) Incomplete gasoline-fueled heavy-duty vehicles shall have the following prominent statement printed on the label required in paragraph (a)(4) of this section: "(Manufacturer's corporate name) has determined that this vehicle conforms to U.S. EPA regulations applicable to 19\_\_ Model Year New Gasoline-Fueled Heavy-Duty

Vehicles when completed with a nominal fuel tank capacity not to exceed \_\_\_\_\_ gallons. Persons wishing to add fuel tank capacity beyond the above maximum must submit a written statement to the Administrator that the hydrocarbon storage system has been upgraded according to the requirements of 40 CFR 86.091-35(g)(2)."

(ii) Incomplete methanol-fueled heavy-duty vehicles shall have the following prominent statement printed on the label required in paragraph (a)(4) of this section: "(Manufacturer's corporate name) has determined that this vehicle conforms to U.S. EPA regulations applicable to 19\_\_\_\_ Model Year New Methanol-Fueled Heavy-Duty Vehicles when completed with a nominal fuel tank capacity not to exceed \_\_\_\_\_ gallons. Persons wishing to add fuel tank capacity beyond the above maximum must submit a written statement to the Administrator that the hydrocarbon storage system has been upgraded according to the requirements of 40 CFR 86.091-35(g)(2)."

(h)(1) Light-duty trucks and heavy-duty engines for which nonconformance penalties are to be paid in accordance with § 86.1113-87(b) shall have the following information printed on the label required in paragraph (a) of this section or on a separate permanent legible label in the English language and located in proximity to the label required in paragraph (a) of this section. The manufacturer shall begin labeling production engines or vehicles within 10 days after the completion of the PCA.

(i) The statement: "The manufacturer of this engine/vehicle will pay a penalty to be allowed to introduce it into commerce at an emission level higher than the applicable emission standard. The compliance level (or new emission standard) for this engine/vehicle is \_\_\_\_\_" (The manufacturer shall insert the applicable pollutant and compliance level calculated in accordance with § 86.1112-87(a).)

(2) If a manufacturer introduces an engine or vehicle into commerce prior to the compliance level determination of § 86.1112-87(a), it shall provide the engine or vehicle owner with a label as described above to be affixed in a location in proximity to the label required in paragraph (a) of this section within 30 days of the completion of the PCA.

32. Section 86.104 of Subpart B is amended by revising paragraph (b), to read as follows:

§ 86.104 Section numbering; construction.

(b) Unless indicated otherwise, all provisions in this subpart apply to petroleum-fueled and methanol-fueled vehicles.

33. Section 86.105 of Subpart B is amended by revising paragraph (a), to read as follows:

§ 86.105 Introduction; structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to perform gaseous exhaust, diesel particulate, and evaporative emission tests on light-duty vehicles and light-duty trucks. Subpart A sets forth testing requirements and test intervals necessary to comply with EPA certification procedures.

34. A new § 86.106-90 is added to Subpart B, to read as follows:

§ 86.106-90 Equipment required; overview.

(a) This subpart contains procedures for exhaust emissions tests on petroleum-fueled, and methanol-fueled light-duty vehicles and light-duty trucks, and for evaporative emission tests on gasoline-fueled and methanol-fueled light-duty vehicles and light-duty trucks. Certain items of equipment are not necessary for a particular test, e.g., evaporative enclosure when testing diesel vehicles. Alternate sampling systems may be used if shown to yield equivalent results, and if approved in advance by the Administrator. Equipment required and specifications are as follows:

(1) *Evaporative emission tests, gasoline-fueled and methanol-fueled vehicles.* The evaporative emission test is closely related to and connected with the exhaust emission test. All vehicles tested for evaporative emissions must be tested for exhaust emissions. Further, unless the evaporative emission test is waived by the Administrator under § 86.090-26, all gasoline-fueled and methanol-fueled vehicles must undergo both tests. (Diesel vehicles are excluded from the evaporative emission standard.) Section 86.107 specifies the necessary equipment.

(2) *Exhaust emission tests.* All vehicles subject to this subpart are tested for exhaust emissions. The exhaust from Otto-cycle vehicles is tested for gaseous emissions only, using the CVS concept (§ 86.109). The exhaust from diesel vehicles is tested for both gaseous and particulate emissions. Petroleum-fueled diesel vehicle testing also utilizes the CVS concept of measuring emissions, but requires that a PDP-CVS or CFV with heat exchanger be used, and that it be connected to a

dilution tunnel in order to sample particulate emissions (§ 86.110). The exhaust from methanol-fueled diesel vehicles is tested for both gaseous and particulate emissions using the CVS concept (either PDP CVS or CFV as specified in § 86.109 or PDP-CVS or CFV with heat exchanger as specified in § 86.110 may be used) and is connected to a dilution tunnel to sample particulate emissions (§ 86.110) (This equipment may be used with methanol-fueled Otto-cycle vehicles, however, particulates are not measured). All gasoline-fueled and methanol-fueled vehicles are either tested for evaporative emissions or undergo a diurnal heat build. Petroleum-fueled diesel vehicles are excluded from this requirement. Equipment necessary and specifications appear in §§ 86.108 through 86.114.

(3) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for exhaust and evaporative emissions testing and for mileage accumulation for petroleum-fueled and methanol-fueled vehicles are specified in § 86.113. Analytical gases are specified in § 86.114. The EPA Urban Dynamometer Driving Schedule (UDDS) for use in petroleum-fueled and methanol-fueled exhaust emissions tests is specified in § 86.115 and Appendix I.

35. A new § 86.107-90 is added to Subpart B, to read as follows:

§ 86.107-90 Sampling and analytical system; evaporative emissions.

(a) Component description (evaporative emissions sampling system). The following components will be used in evaporative emissions sampling systems for testing under this subpart.

(1) *Evaporative emission measurement enclosure.* The enclosure shall be readily sealable, rectangular in shape, with space for personnel access to all sides of the vehicle. When sealed, the enclosure shall be gas tight in accordance with § 86.117. Interior surfaces must be impermeable and non-reactive to hydrocarbons and to methanol (if the enclosure is used for methanol-fueled vehicles). One surface should be of flexible, impermeable and non-reactive material to allow for minor volume changes, resulting from temperature changes. Wall design should promote maximum dissipation of heat, and if artificial cooling is used, interior surface temperatures shall not be less than 68°F (20°C).

(2) *Evaporative emission hydrocarbon and methanol analyzers.* (i) For gasoline- and methanol-fueled vehicles a hydrocarbon analyzer utilizing the hydrogen flame ionization principle

(FID) shall be used to monitor the atmosphere within the enclosure (a heated FID (HFID)( $235^{\circ} \pm 15^{\circ}\text{F}$  ( $113 \pm 8^{\circ}\text{C}$ )) is required for methanol-fueled vehicles). Instrument bypass flow may be returned to the enclosure. The FID shall have a response time to 90 percent of final reading of less than 1.5 seconds, and be capable of meeting performance requirements expressed as a function of Cstd: where Cstd is the specific enclosure hydrocarbon level, in ppm, corresponding to the evaporative emission standard:

(A) Stability of the analyzer shall be better than 0.01 Cstd ppm at zero and span over a 15-minute period on all ranges used.

(B) Repeatability of the analyzer, expressed as one standard deviation, shall be better than 0.005 Cstd ppm on all ranges used.

(ii) For methanol-fueled vehicles, a methanol sampling and analyzing system is required in addition to the FID analyzer. The methanol sampling equipment shall consist of impingers for collecting the methanol sample and appropriate equipment for drawing the sample through the impingers. The analytical equipment shall consist of a gas chromatograph equipped with a flame ionization detector. (NOTE: For 1990 through 1994 model year methanol-fueled vehicles, a HFID calibrated on methanol may be used in place of the HFID, calibrated on propane plus the methanol impingers and associated analytical equipment).

(3) *Evaporative emission hydrocarbon and methanol data recording system.* (i) The electrical output of the FID used for measuring hydrocarbons (or hydrocarbons plus methanol as appropriate) shall be recorded at least at the initiation and termination of each diurnal or hot soak. The recording may be by means of a strip chart potentiometric recorder, by use of an on-line computer system or other suitable means. In any case, the recording system must have operational characteristics (signal to noise ratio, speed of response, etc.) equivalent to or better than those of the signal source being recorded, and must provide a permanent record of results. The record shall show a positive indication of the initiation and completion of each diurnal or hot soak along with the time elapsed between initiation and completion of each soak.

(ii) For the methanol sample, permanent records shall be made of the following: the volumes of deionized water introduced into each impinger, the rate and time of sample collection, the volumes of each sample introduced into the gas chromatograph, the flow rate of

carrier gas through the column, the column temperature, and the chromatogram of the analyzed sample.

(4) *Tank fuel heating system.* The tank fuel heating system shall consist of a heat source and a temperature controller. A typical heat source is a 2000 W heating pad. Other sources may be used as required by circumstances. The temperature controller may be manual, such as a variable voltage transformer, or may be automated. The heating system must not cause hot spots on the tank wetted surface which could cause local overheating of the fuel. Heat must not be applied to the vapor in the tank above the liquid fuel. The temperature controller must be capable of controlling the fuel tank temperature during the diurnal soak to within  $\pm 3^{\circ}\text{F}$  ( $\pm 1.7^{\circ}\text{C}$ ) of the following equation:

$$F = T_o + (0.4)t$$

$$\text{or For SI units:}$$

$$C = T_o + (2/9)t$$

Where:

F = Temperature in  $^{\circ}\text{F}$ .

C = Temperature in  $^{\circ}\text{C}$ .

t = Time since start of test in minutes.

$T_o$  = initial temperature in  $^{\circ}\text{F}$  (or in  $^{\circ}\text{C}$  for SI units).

(5) *Temperature recording system.* Strip chart recorder(s) or automatic data processor shall be used to record enclosure ambient and vehicle fuel tank temperature during the evaporative emissions test. The temperature recorder or data processor shall record each temperature at least once every minute. The recording system shall be capable of resolving time to  $\pm 15\text{s}$  and capable of resolving temperature to  $\pm 0.75^{\circ}\text{F}$  ( $\pm 0.42^{\circ}\text{C}$ ). The temperature recording system (recorder and sensor) shall have an accuracy of  $\pm 3^{\circ}\text{F}$  ( $\pm 1.7^{\circ}\text{C}$ ). The recorder (data processor) shall have a time accuracy of  $\pm 15\text{s}$  and a precision of  $\pm 15\text{s}$ . Two ambient temperature sensors, connected to provide one average output, shall be located in the enclosure. These sensors shall be located at the approximate vertical centerline of each side wall extending 4 inches (nominally) into the enclosure at a height of  $3 \pm 0.5\text{ ft}$  ( $0.9 \pm 0.2\text{ m}$ ). The vehicle fuel tank temperature sensor shall be located in the fuel tank so as to measure the temperature of the prescribed test fuel at the approximate mid-volume of the fuel. Manufacturers shall arrange that vehicles furnished for testing at Federal certification facilities be equipped with iron-constantan Type J thermocouples for measurement of fuel tank temperature.

(6) *Purge blower.* One or more portable or fixed blowers shall be used to purge the enclosure. The blowers

shall have sufficient flow capacity to reduce the enclosure hydrocarbon and/or methanol concentration from the test level to the ambient level between tests. Actual flow capacity will depend upon the time available between tests.

(7) *Mixing blower.* One or more small blowers or fans with a total capacity of 200 to 1000 cfm shall be used to mix the contents of the enclosure during evaporative emission testing. No portion of the air stream shall be directed toward the vehicle. Maintenance of uniform concentrations throughout the enclosure is important to the accuracy of the test.

36. A new  $\S$  86.109-90 is added to Subpart B, to read as follows:

**$\S$  86.109-90 Exhaust gas sampling system; Otto-cycle vehicles.**

(a)(1) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of gaseous emissions in the exhaust of either Otto-cycle light-duty vehicles and light-duty trucks. In the CVS concept of measuring mass emissions, two conditions must be satisfied: the total volume of the mixture of exhaust and dilution air must be measured, and a continuously proportioned volume of sample must be collected for analysis. Mass emissions are determined from the sample concentration and total flow over the test period.

(2) *Vehicle tailpipe to CVS Duct.* For methanol-fueled vehicles, cooling of the exhaust gases in the duct connecting the vehicle tailpipe to the CVS shall be minimized. This may be accomplished by:

(i) Using a duct of unrestricted length maintained at  $235^{\circ} \pm 15^{\circ}\text{F}$  ( $113^{\circ} \pm 8^{\circ}\text{C}$ ), heating and possible cooling capabilities are required; or

(ii) Using a short duct (up to 12 feet long) constructed of smooth wall pipe with a minimum of flexible sections, maintained at  $235^{\circ} \pm 15^{\circ}\text{F}$  ( $113^{\circ} \pm 8^{\circ}\text{C}$ ) prior to the test and during the 10 minute hot soak segment and uninsulated during the test (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded); or

(iii) Using smooth wall duct less than five feet long with no required heating.

(iv) Omitting the duct and performing the exhaust gas dilution function at the vehicle tailpipe exit.

(3) *Positive displacement pump.* The Positive Displacement Pump-Constant Volume Sampler (PDP-CVS), Figure B90-1 satisfies the first condition by metering at a constant temperature and pressure through the pump. The total

volume is measured by counting the revolutions made by the calibrated positive displacement pump. The proportional samples for the bag sample, and for methanol-fueled vehicles, the methanol sample (Figure B90-2) and the

formaldehyde sample (Figure B90-3), are achieved by sampling at a constant flow rate. For methanol-fueled vehicles, the sample lines for the methanol and formaldehyde samples are heated to  $235^{\circ}\pm 15^{\circ}\text{F}$  ( $113^{\circ}\pm 8^{\circ}\text{C}$ ).

**Note.**—For 1990 through 1994 model year methanol-fueled vehicles, methanol and formaldehyde sampling may be omitted provided the bag sample (hydrocarbons and methanol) is analyzed using a HFID calibrated with methanol.

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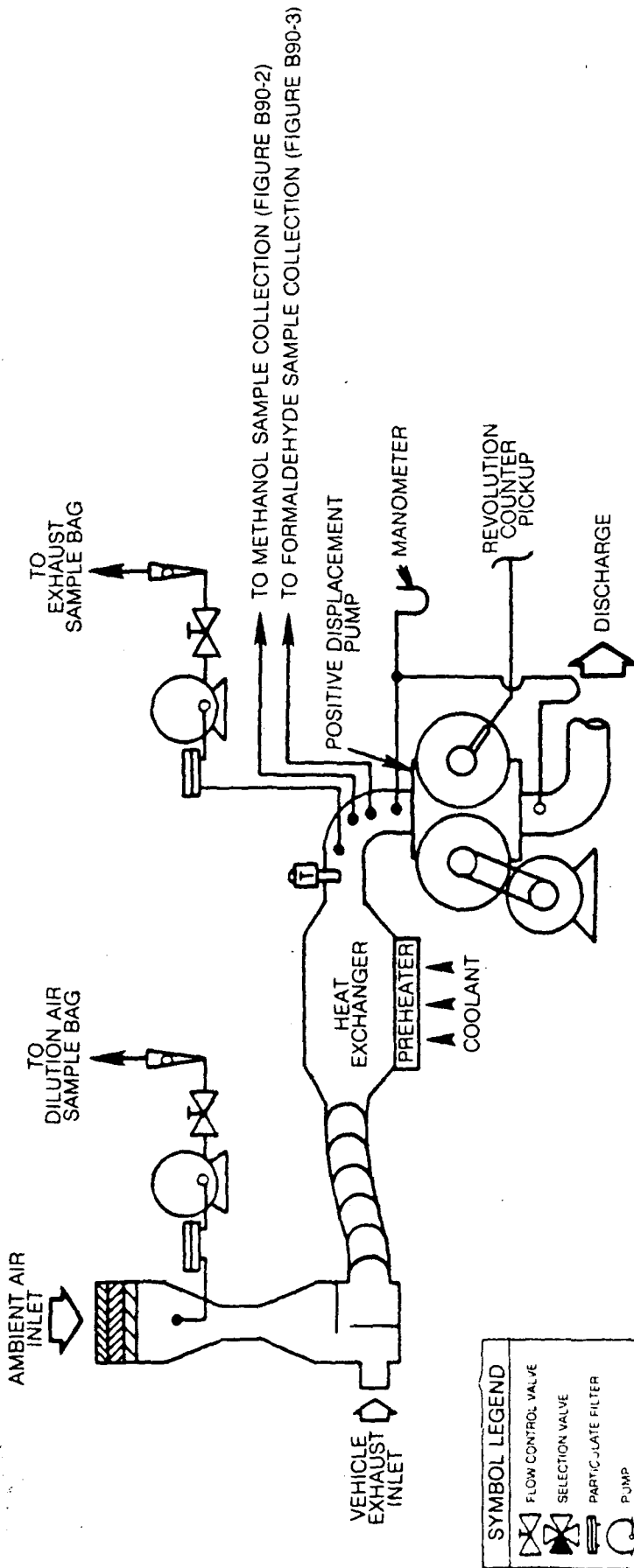


FIGURE B90-1 EXHAUST GAS SAMPLING SYSTEM (PDP-CVS)

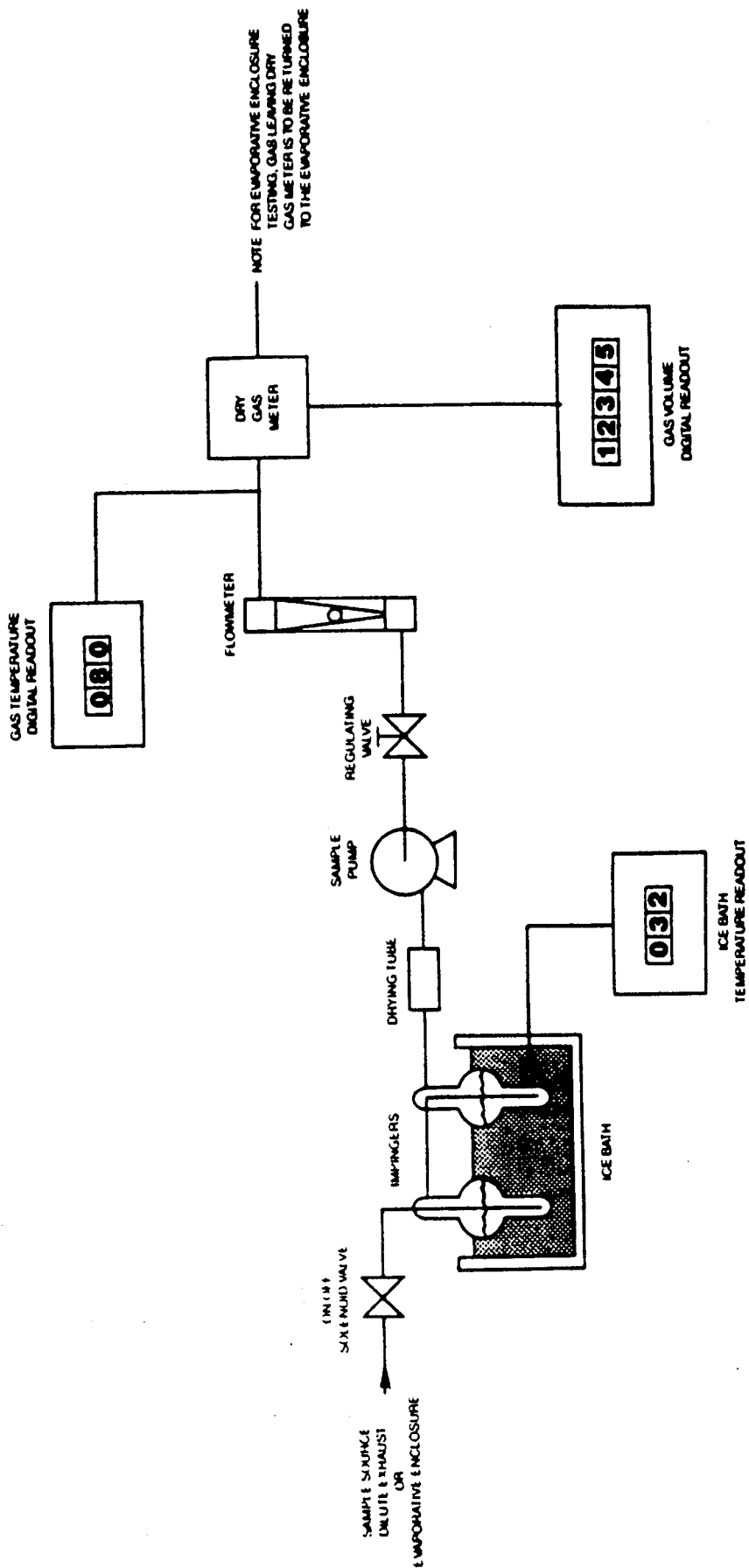


FIGURE B91-2 METHANOL SAMPLE COLLECTION FLOW SCHEMATIC

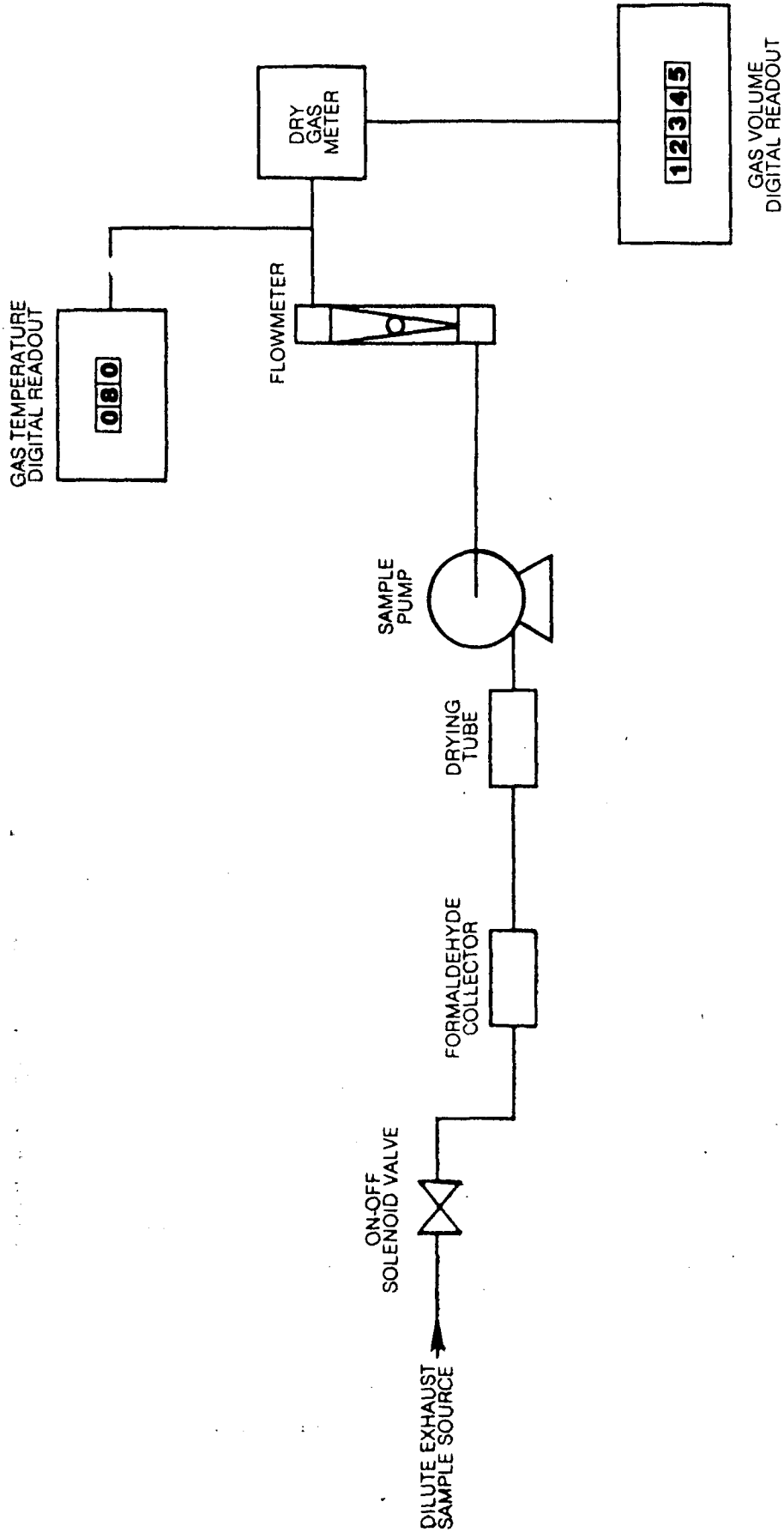


FIGURE B90-3 FORMALDEHYDE SAMPLE COLLECTION FLOW SCHEMATIC

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(4) *Critical flow venturi.* The operation of the Critical Flow Venturi—Constant Volume Sampler (CFV—CVS) sample system, Figure B90-4, is based upon the principles of fluid dynamics associated with critical flow. Proportional sampling throughout temperature excursions is maintained by use of small CFVs in the sample lines (for methanol-fueled vehicles, one line supplies sample for the bag sample, another line supplies sample for the

methanol sample, and a third line supplies sample for the formaldehyde sample.) The methanol and formaldehyde sample lines are heated to  $235^{\circ} \pm 15^{\circ}\text{F}$  ( $113^{\circ} \pm 8^{\circ}\text{C}$ ) with care being taken to ensure that the CFVs of the sample probes are not heated since heating of the CFVs would cause loss of proportionality. The variable mixture flow rate is maintained at sonic velocity, is inversely proportional to the square root of the gas temperature, and is

computed continuously. Since the pressure and temperature are the same at all venturi inlets, the sample volume is proportional to the total volume.

*Note.*—For 1990 through 1994 model year methanol-fueled vehicles, methanol and formaldehyde sampling may be omitted provided the bag sample (hydrocarbons and methanol) is analyzed using a HFID calibrated with methanol.

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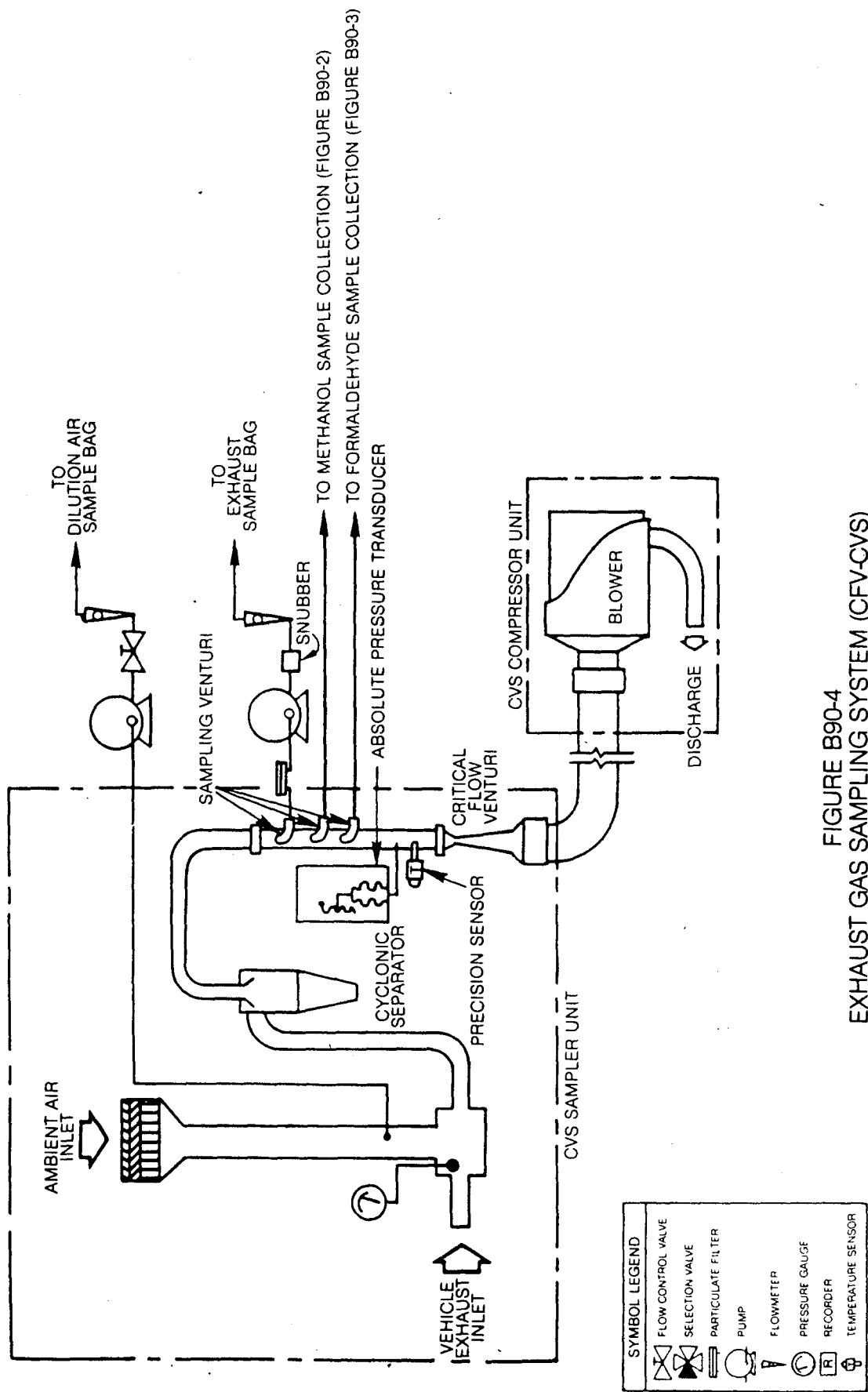


FIGURE B90-4  
EXHAUST GAS SAMPLING SYSTEM (CFV-CVS)

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(5) *Other systems.* Other sampling systems may be used if shown to yield equivalent results, and if approved in advance by the Administrator.

(b) *Component description, PDP-CVS.* The PDP-CVS, Figure B90-1, consists of a dilution air filter and mixing assembly, heat exchanger, positive displacement pump, sampling systems (see Figure B90-2 for methanol sampling system and Figure B90-3 for formaldehyde sampling system) sampling lines which are heated to  $235^{\circ} \pm 15^{\circ} \text{F}$  ( $113^{\circ} \pm 8^{\circ} \text{C}$ ) in the case of the methanol-fueled vehicles (heating of the sample lines may be omitted, provided the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of sample due to cooling and resulting condensation in the sample lines), and associated valves, pressure and temperature sensors. The PDP-CVS shall conform to the following requirements:

(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within  $\pm 5$  inches of water (1.2 kPa) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within  $\pm 1$  inch of water (0.25 kPa) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The gas mixture temperature, measured at a point immediately ahead of the positive displacement pump, shall be within  $\pm 10^{\circ} \text{F}$  ( $\pm 5.6^{\circ} \text{C}$ ) of the designed operating temperature at the start of the test. The gas mixture temperature variation from its value at the start of the test shall be limited to  $\pm 10^{\circ} \text{F}$  ( $\pm 5.6^{\circ} \text{C}$ ) during the entire test. The temperature measuring system shall have an accuracy and precision of  $\pm 2^{\circ} \text{F}$  ( $1.1^{\circ} \text{C}$ ).

(3) The pressure gauges shall have an accuracy and precision of  $\pm 1.6$  inches of water (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to eliminate water condensation in the system. (300 to 350 cfm (0.142 to 0.165  $\text{m}^3/\text{s}$ ) is sufficient for most petroleum-fueled vehicles. Higher flow rates are required for methanol fueled vehicles. Procedures for determining CVS flow rates are detailed in "Calculation of Emissions and Fuel

Economy When Using Alternative Fuels," EPA 460/3-83-009.)

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow. A single dilution air sample, covering the total test period, may be collected for determination of formaldehyde background (methanol-fueled vehicles).

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient capacity so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the PDP.

(c) *Component description, CFV-CVS.* The CFV-CVS sample system, Figure B90-4, consists of a dilution air filter and mixing assembly, a cyclone particulate separator, unheated sampling venturies for the bag samples, and for the methanol and formaldehyde samples from methanol-fueled vehicles, samples lines heated to  $235^{\circ} \pm 15^{\circ} \text{F}$  ( $113^{\circ} \pm 8^{\circ} \text{C}$ ) for the methanol and formaldehyde samples from methanol fueled vehicles (heating of the sample lines may be omitted provided, the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of sample due to cooling and resulting condensation in the sample lines), a critical flow venturi, and assorted valves, and pressure and temperature sensors. The CFV sample system shall conform to the following requirements:

(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within  $\pm 5$  inches of water (1.2 kPa) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within  $\pm 1$  inch of water (0.25 kPa) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The temperature measuring system shall have an accuracy and precision of  $\pm 2^{\circ} \text{F}$  ( $1.1^{\circ} \text{C}$ ) and a response time of 0.100 seconds to 62.5 percent of a temperature change (as measured in hot silicone oil).

(3) The pressure measuring system shall have an accuracy and precision of  $\pm 1.6$  inches of water (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system (300 to 350 cfm (0.142 to 0.165  $\text{m}^3/\text{s}$ ) is sufficient for most petroleum-fueled vehicles). Higher flow rates are required with methanol-fueled vehicles. Procedures for determining CVS flow rates are detailed in "Calculation of Emission and Fuel Economy When Using Alternative Fuels," EPA 460/3-83-009.

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow. A single dilution air sample covering the total test period may be collected for determination of formaldehyde background for methanol-fueled vehicles.

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient capacity so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the CFV-CVS.

37. A new § 86.110-90 is added to Subpart B, to read as follows:

**§ 86.110-90 Exhaust gas sampling system; diesel vehicles.**

(a) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of both gaseous and particulate emissions in the exhaust of either diesel light-duty vehicles and light-duty trucks. This system utilizes the CVS concept (described in § 86.109) of measuring mass emissions. The mass of gaseous emissions is determined from the sample concentration and total flow over the test period. The mass of particulate emissions is determined from a proportional mass sample collected on a filter and from the total flow over the test period. General requirements are as follows:

(1) This sampling system requires the use of a PDP-CVS or a CFV sample system with heat exchanger connected to a dilution tunnel. Figure B90-5 is a schematic drawing of the PDP system. Figure B90-6 is a schematic drawing of the CFV system (methanol-fueled Otto-cycle vehicles may be tested using this test equipment.)

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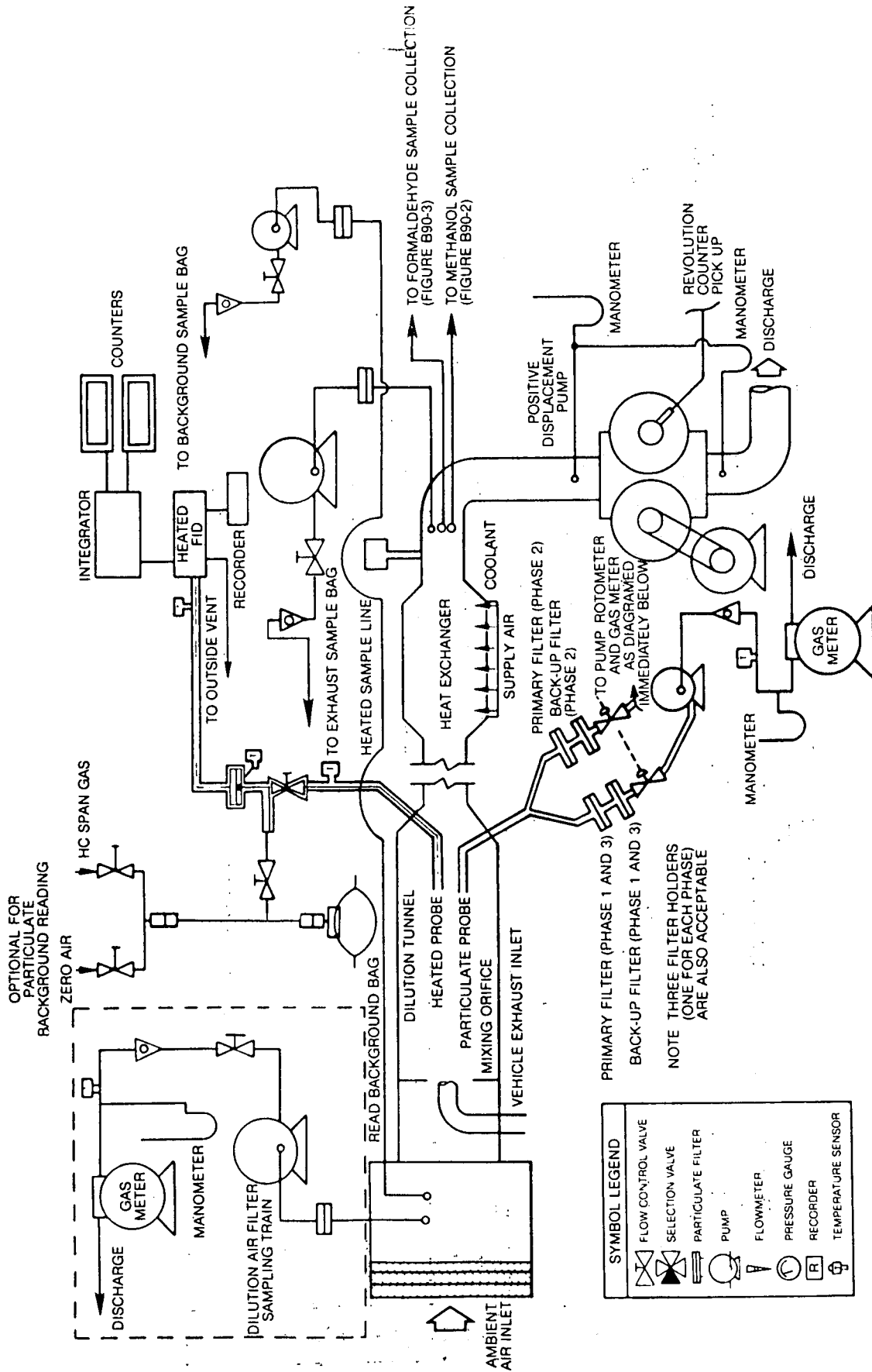


FIGURE B90-5 GASEOUS AND PARTICULATE EMISSIONS SAMPLING SYSTEM (PDP-CVS)

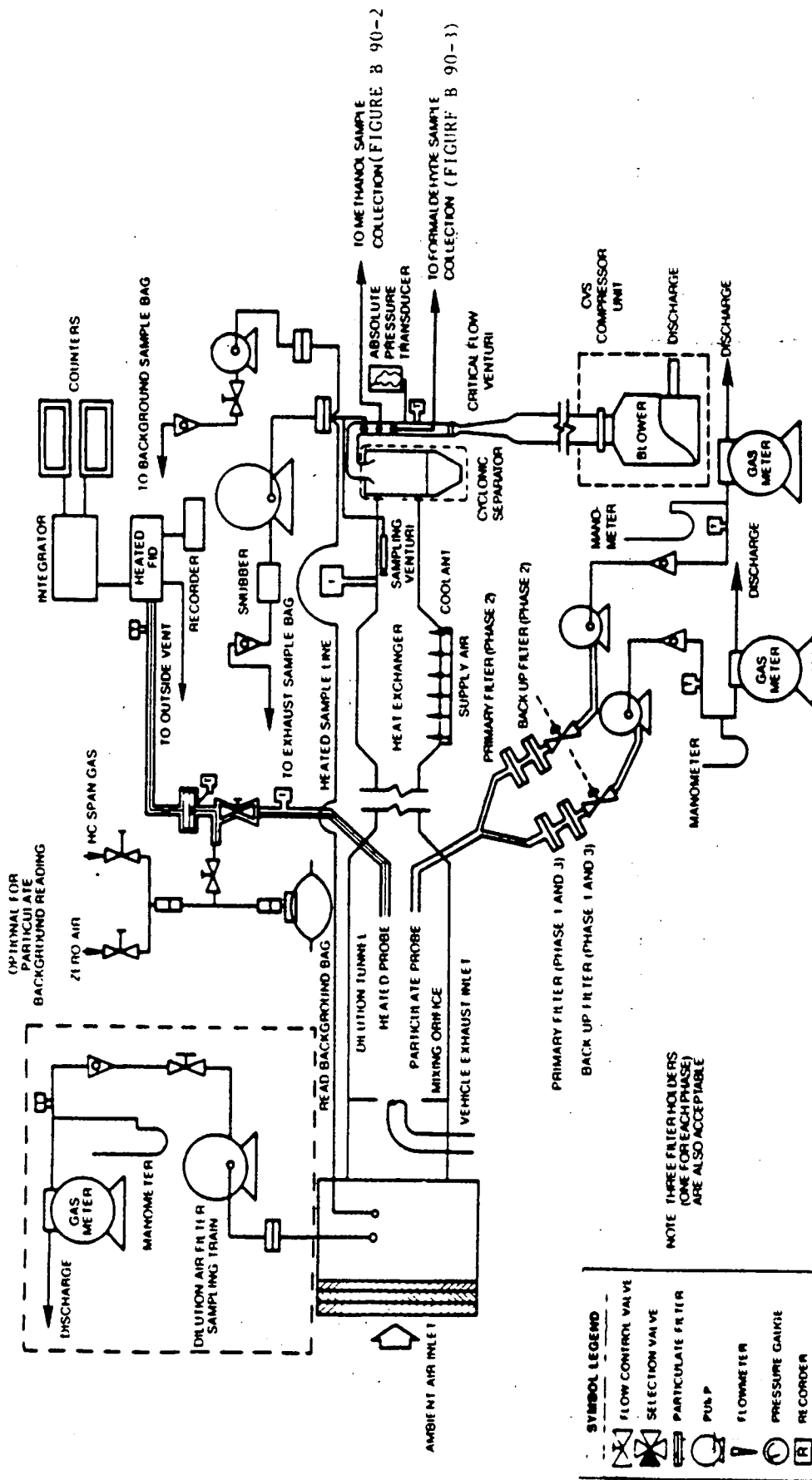


FIGURE B M-6  
GASEOUS AND PARTICULATE EMISSIONS SAMPLING SYSTEM (CFV-CVS)

BILLING CODE 6560-50-C

(2) Bag, HFID, and particulate sampling capabilities as shown in Figure B90-5 (or Figure B90-6) are required to provide both gaseous and particulate emissions sampling capabilities from a single system.

(3) Petroleum-fueled diesel vehicles require a heated flame ionization detector (HFID) ( $375^{\circ}\pm 20^{\circ}\text{F}$  ( $191^{\circ}\pm 11^{\circ}\text{C}$ )) sample for hydrocarbon analysis. The HFID sample must be taken directly from the diluted exhaust stream through a heated probe in the dilution tunnel.

(4) Methanol-fueled vehicles require the use of a heated flame ionization detector (HFID) ( $235^{\circ}\pm 15^{\circ}\text{F}$  ( $113^{\circ}\pm 8^{\circ}\text{C}$ )) for hydrocarbon analysis. With an HFID, the hydrocarbon analysis can be made on the bag sample and the methanol and formaldehyde analyses are performed on the samples collected for these purposes (Figures B90-2 and B90-3). NOTE: For 1990 through 1994 model year methanol-fueled vehicles, methanol and formaldehyde sampling may be omitted provided the bag sample is analyzed using a HFID calibrated with methanol.

(5) Methanol-fueled vehicles require either:

(i) A tailpipe to dilution tunnel duct of unrestricted length maintained at  $235^{\circ}\pm 15^{\circ}\text{F}$  ( $113^{\circ}\pm 8^{\circ}\text{C}$ ) through heating and cooling as required; or

(ii) Using short duct (up to 12 feet long) constructed of smooth wall pipe with a minimum of flexible sections maintained at  $235^{\circ}\pm 15^{\circ}\text{F}$  ( $113^{\circ}\pm 8^{\circ}\text{C}$ ) prior to the test and during breaks in testing (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded); or

(iii) Using a smooth wall duct less than five feet long with no required heating, or

(iv) Omitting the duct and performing the exhaust gas dilution function at the vehicle tailpipe exit.

(6) Since various configurations can produce equivalent results, exact conformance with these drawings is not required. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems.

(7) Other sampling systems may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(b) *Component description—petroleum-fueled diesel vehicles.* The components necessary for petroleum fueled diesel vehicle exhaust sampling shall meet the following requirements:

(1) The PDP-CVS, Figure B90-5, shall conform to all of the requirements listed for the exhaust gas PDP-CVS (§ 86.109(b)), with one exception: a flow rate of sufficient volume is required to maintain the diluted exhaust stream, from which the particulate sample flow is taken, at a temperature of  $125^{\circ}\text{F}$  ( $52^{\circ}\text{C}$ ) or less.

(2) The CFV sample system, Figure B90-6, shall conform to all of the requirements listed for the exhaust gas CFV sample system (§ 86.109(c)), with four exceptions:

(i) A flow rate of sufficient volume is required to maintain the diluted exhaust stream, from which the particulate sample flow is taken, at a temperature of  $125^{\circ}\text{F}$  ( $52^{\circ}\text{C}$ ) or less.

(ii) A heat exchanger is required.

(iii) The gas mixture temperature, measured at a point immediately ahead of the critical flow venturi, shall be within  $\pm 20^{\circ}\text{F}$  ( $11^{\circ}\text{C}$ ) of the designed operating temperature at the start of the test. The gas mixture temperature variation from its value at the start of the test shall be limited to  $\pm 20^{\circ}\text{F}$  ( $11^{\circ}\text{C}$ ) during the entire test. The temperature measuring system shall have an accuracy and precision of  $\pm 2^{\circ}\text{F}$  ( $1.1^{\circ}\text{C}$ ).

(iv) The cyclonic separator is optional.

(3) The transfer of heat from the vehicle exhaust gas shall be minimized between the point where it leaves the vehicle tailpipe(s) and the point where it enters the dilution tunnel airstream. To accomplish this, a short length (not more than 12 feet (365 cm) if uninsulated, or not more than 20 feet (610 cm) if insulated) of smooth stainless steel tubing from the tailpipe to the dilution tunnel is required. This tubing shall have a maximum inside diameter of 4.0 inches (10.2 cm). Short sections of flexible tubing at connection points are allowed.

(4) The vehicle exhaust shall be directed downstream at the point where it is introduced into the dilution tunnel.

(5) The dilution air shall be between  $68^{\circ}\text{F}$  ( $20^{\circ}\text{C}$ ) and  $86^{\circ}\text{F}$  ( $30^{\circ}\text{C}$ ) during the test.

(6) The dilution tunnel shall be:

(i) Sized to permit development of turbulent flow (Reynold's No.  $>> 4000$ ) and complete mixing of the exhaust and dilution air between the mixing orifice and each of the two sample probes (*i.e.*, the particulate probe and the heated HC sample probe). It is recommended that uniform mixing be demonstrated by the user.

(ii) At least 8.0 inches (20.3 cm) in diameter.

(iii) Constructed of electrically conductive material which does not react with the exhaust components.

(iv) Grounded.

(7) The temperature of the diluted exhaust stream inside of the dilution tunnel shall be sufficient to prevent water condensation. However, the sample zone dilute exhaust temperature shall not exceed  $125^{\circ}\text{F}$  ( $52^{\circ}\text{C}$ ) at any time during the test.

(8) The particulate sample probe shall be:

(i) Installed facing upstream at a point where the dilution air and exhaust are well mixed (*i.e.*, near the tunnel centerline, approximately 10 tunnel diameters downstream from the point where the exhaust enters the dilution tunnel).

(ii) Sufficiently distant (radially) from the total hydrocarbon probe so as to be free from the influence of any wakes or eddies produced by the total hydrocarbon probe.

(iii) 0.5 inch (1.27 cm) minimum inside diameter.

(iv) The distance from the sampling tip to the filter holder shall be at least 5 probe diameters (for filters located inside of the tunnel), but not more than 40.0 inches (102 cm) for filters located outside of the dilution tunnel.

(v) Free from sharp bends.

(vi) Configured so that a clean particulate filter (including back-up filter) can be selected simultaneously with the selection of an empty gaseous emissions bag.

(9) The flow rate through the particulate probe shall be maintained to a constant value within  $\pm 5$  percent of the set flow rate.

(10) The particulate sample pump shall be located sufficiently distant from the dilution tunnel so that the inlet gas temperature is maintained at a constant temperature ( $\pm 5.0^{\circ}\text{F}$  ( $2.8^{\circ}\text{C}$ )).

(11) The gas meters or flow instrumentation shall be located sufficiently distant from the tunnel so that the inlet gas temperature remains constant ( $\pm 5.0^{\circ}\text{F}$  ( $2.8^{\circ}\text{C}$ )).

(12) The total hydrocarbon probe shall be:

(i) Installed facing upstream at a point where the dilution air and exhaust are well mixed (*i.e.*, approximately 10 tunnel diameters downstream from the point where the exhaust enters the dilution tunnel).

(ii) Sufficiently distant (radially) from the particulate probe so as to be free from the influence of any wakes or eddies produced by the particulate probe.

(iii) Heated and insulated over the entire length to maintain a  $375^{\circ}\pm 20^{\circ}\text{F}$  ( $191^{\circ}\pm 11^{\circ}\text{C}$ ) wall temperature.

(iv) 0.19 in. (0.48 cm) minimum inside diameter.

(13) It is intended that the total hydrocarbon probe be free from cold spots (*i.e.*, free from spots where the probe *wall* temperature is less than 355°F). This will be determined by a temperature sensor located on a section of the probe wall outside of the dilution tunnel. The temperature sensor shall be insulated from any heating elements on the probe. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(14) The dilute exhaust gas flowing in the total hydrocarbon sample system shall be:

(i) At  $375^\circ\text{F} \pm 10^\circ\text{F}$  ( $191^\circ\text{C} \pm 6^\circ\text{C}$ ) immediately before the heated filter. This will be determined by a temperature sensor located immediately upstream of the filter. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(ii) At  $375^\circ\text{F} \pm 10^\circ\text{F}$  ( $191^\circ\text{C} \pm 6^\circ\text{C}$ ) immediately before the HFID. This will be determined by a temperature sensor located at the exit of the heated sample line. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(15) It is intended that the dilute exhaust gas flowing in the total hydrocarbon sample system be between 365°F and 385°F ( $185^\circ\text{C}$  and  $197^\circ\text{C}$ ).

(c) *Component description—methanol-fueled diesel vehicles.* The components necessary for methanol-fueled diesel vehicle exhaust sampling shall meet the following requirements:

(1) The PDP-CVS, Figure B90-5 shall conform to all of the requirements listed for the exhaust gas PDP-CVS (§ 86.109 (a)(3) and (b)), with one exception: a flow rate of sufficient volume is required to maintain the diluted exhaust stream, from which the particulate sample flow is taken, at a temperature of 125°F ( $52^\circ\text{C}$ ) or less and shall prevent the condensation of water vapor in the dilution tunnel.

(2) The CFV sample system, Figure B90-6 shall conform to all of the requirements listed for the exhaust gas CFV sample system (§ 86.109 (a)(4) and (c)), with four exceptions:

(i) A flow rate of sufficient volume is required to maintain the diluted exhaust stream, from which the particulate sample flow is taken, at a temperature of 125°F ( $52^\circ\text{C}$ ) or less and shall prevent the condensation of water vapor in the dilution tunnel.

(ii) A heat exchanger is required.

(iii) The gas mixture temperature, measured at a point immediately ahead of the critical flow venturi, shall be within  $\pm 20^\circ\text{F}$  ( $11^\circ\text{C}$ ) of the designed operating temperature at the start of the test. The gas mixture temperature variation from its value at the start of the test shall be limited to  $\pm 20^\circ\text{F}$  ( $11^\circ\text{C}$ ) during the entire test. The temperature

measuring system shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(iv) The cyclonic separator is optional.

(3) Losses of methanol due to condensation of water in the duct connecting the vehicle tail pipe to the dilution tunnel must be minimized. This may be accomplished by:

(i) The use of a duct of unrestricted length maintained at  $235^\circ \pm 15^\circ\text{F}$  ( $113^\circ \pm 8^\circ\text{C}$ ) through heating and cooling as required, or

(ii) The use of a short duct (up to 12 feet long) constructed of smooth wall pipe with a minimum of flexible sections maintained at  $235^\circ \pm 15^\circ\text{F}$  ( $113^\circ \pm 8^\circ\text{C}$ ) prior to the test and during breaks in testing (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded); or

(iii) Using a smooth wall duct less than five feet long with no required heating, or

(iv) Omitting the duct and performing the exhaust gas dilution function at the vehicle tailpipe exit.

(4) The vehicle exhaust shall be directed downstream at the point where it is introduced into the dilution tunnel.

(5) The dilution air shall be between 68°F ( $20^\circ\text{C}$ ) and 86°F ( $30^\circ\text{C}$ ) during the test.

(6) The dilution tunnel shall be:

(i) Sized to permit development of turbulent flow (Reynold's No.  $> > 4000$ ) and complete mixing of the exhaust and dilution air between the mixing orifice and the particulate sample probe. It is recommended that uniform mixing be demonstrated by the user.

(ii) At least 8.0 inches (20.3 cm) in diameter.

(iii) Constructed of electrically conductive material which does not react with the exhaust components.

(iv) Grounded.

(7) The temperature of the diluted exhaust stream inside of the dilution tunnel shall be sufficient to prevent water condensation. However, the sample zone dilute exhaust temperature shall not exceed 125°F ( $52^\circ\text{C}$ ) at any time during the test.

(8) The particulate sample probe shall be:

(i) Installed facing upstream at a point where the dilution air and exhaust are well mixed (*i.e.*, near the tunnel centerline, approximately 10 tunnel diameters downstream from the point where the exhaust enters the dilution tunnel).

(ii) Sufficiently distant (radially) from the total hydrocarbon probe so as to be free from the influence of any wakes or eddies produced by the total hydrocarbon probe.

(iii) 0.5 inch (1.27 cm) minimum inside diameter.

(iv) The distance from the sampling tip to the filter holder shall be at least 5 probe diameters (for filters located inside of the tunnel), but not more than 40.0 inches (102 cm) for filters located outside of the dilution tunnel.

(v) Free from sharp bends.

(vi) Configured so that a clean particulate filter (including back up filter) can be selected simultaneously with the selection of an empty gaseous emissions bag.

(9) The flow rate through the particulate probe shall be maintained to a constant value within  $\pm 5$  percent of the set flow rate.

(10) The particulate sample pump shall be located sufficiently distant from the dilution tunnel so that the inlet gas temperature is maintained at a constant temperature ( $\pm 5.0^\circ\text{F}$  ( $2.8^\circ\text{C}$ )).

(11) The gas meters or flow instrumentation shall be located sufficiently distant from the tunnel so that the inlet gas temperature remains constant ( $\pm 5.0^\circ\text{F}$  ( $2.8^\circ\text{C}$ )).

(12) The hydrocarbon probe shall be:

(i) Installed facing upstream at a point where the dilution air and exhaust are well mixed (*i.e.*, approximately 10 tunnel diameters downstream from the point where the exhaust enters the dilution tunnel).

(ii) Sufficiently distant (radially) from the particulate probe so as to be free from the influence of any wakes or eddies produced by the particulate probe.

(iii) Heated and insulated over the entire length to maintain a  $235^\circ \pm 15^\circ\text{F}$  ( $113^\circ \pm 8^\circ\text{C}$ ) *wall* temperature.

(iv) 0.19in. (0.48 cm) minimum inside diameter.

(13) It is intended that the total hydrocarbon probe be free from cold spots (*i.e.*, free from cold spots where the probe *wall* temperature is less than 220°F.) This will be determined by a temperature sensor located on a section of the probe wall outside of the dilution tunnel. The temperature sensor shall be insulated from any heating elements on the probe. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(14) The dilute exhaust gas flowing in the hydrocarbon sample system shall be:

(i) At  $235^\circ\text{F} \pm 15^\circ\text{F}$  ( $113^\circ\text{C} \pm 8^\circ\text{C}$ ) immediately before the heated filter. This will be determined by a temperature sensor located immediately upstream of the filter. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(ii) At  $235^\circ\text{F} \pm 15^\circ\text{F}$  ( $113^\circ\text{C} \pm 8^\circ\text{C}$ ) immediately before the HFID. This will be determined by a temperature sensor

located at the exit of the heated sample line. The sensor shall have an accuracy and precision of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ).

(15) It is intended that the dilute exhaust gas flowing in the hydrocarbon sample system be between  $220^\circ\text{F}$  and  $250^\circ\text{F}$  ( $105^\circ\text{C}$  and  $121^\circ\text{C}$ ).

(16) For methanol-fueled vehicles, bag sampling procedures for the measurement of hydrocarbons as

described in Section 86.109 may be employed.

(d) Filters, particulate sampling.

(1) Filter acceptance criteria. Valid diesel particulate net filter weights shall be accepted according to the following criteria:

(i) During each phase of the UDDS, dilute exhaust will be simultaneously sampled by paired primary test and back-up test filters.

(ii) The back-up filter holder shall be located 3 to 4 inches downstream of the primary filter holder.

(iii) The net weight of particulate material collected on each primary test filter and each back-up test filter shall be determined by the procedure outlined in § 86.139.

(iv) A ratio of net weights will be determined by the following formula:

$$\text{Ratio of net weights} = \frac{(\text{Mass Particulate})_{\text{primary filter}}}{(\text{Mass Particulate})_{\text{primary filter}} + (\text{Mass Particulate})_{\text{back-up filter}}}$$

(v) If the ratio is greater than 0.95, then particulate emissions calculations are based on the net weight of the primary filter only.

(vi) If the ratio is less than 0.95, then particulate emissions calculations are based on the combined net weights of the back-up test filter and the primary test filter.

(2) The particulate filter must have a minimum 47 mm diameter (37 mm stain area). Larger diameter filters are also acceptable. (Larger diameter filters may be desirable in order to reduce the pressure drop across the filter when testing vehicles which produce large amounts of particulate.)

(3) The recommended minimum loading on the primary 47 mm filter is 0.5 milligrams. Equivalent loadings (i.e., mass/stain area) are recommended for larger filters.

(4) Fluorocarbon coated glass fiber filters or fluorocarbon-based (membrane) filters are required for particulate collection.

38. A new § 86.111-90 is added to Subpart B, to read as follows:

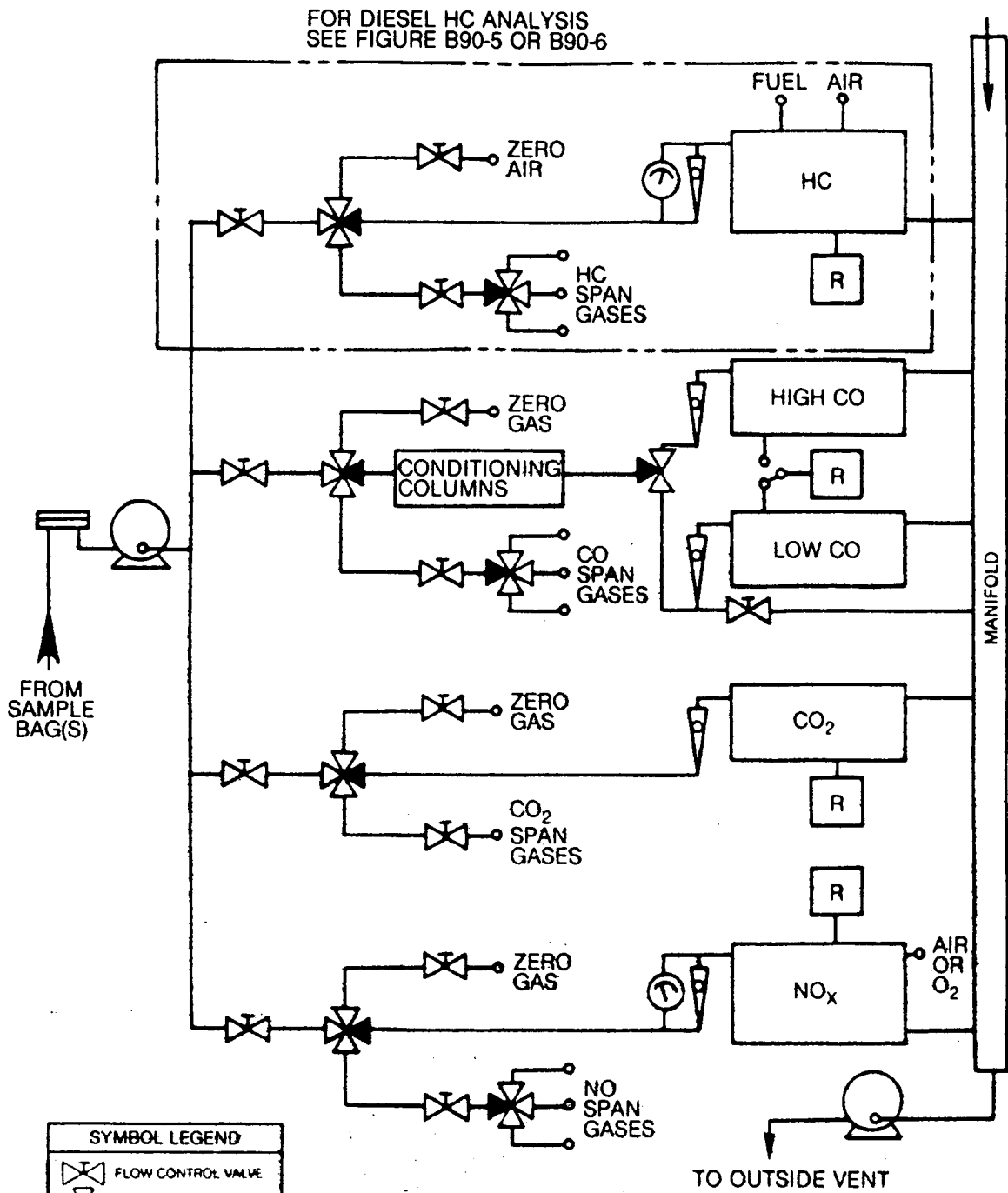
**§ 86.111-90 Exhaust gas analytical system.**

(a) *Schematic drawings.* Figure B90-7 is a schematic drawing of the exhaust gas analytical system for analysis of hydrocarbons (HC) (hydrocarbons plus methanol in the case of methanol-fueled

vehicles), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>). The schematic diagram of the hydrocarbon analysis train for diesel vehicles (and for hydrocarbons plus methanol for methanol-fueled diesel vehicles if continuous HFID analysis is employed) is shown as part of Figure B90-5 (or Figure B90-6). Since various configurations can produce accurate results, exact conformance with either drawing is not required. Additional components such as instruments, valves, solenoids, pumps and switches may be used to provide additional information and coordinate the functions of the component systems.

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SYMBOL LEGEND	
	FLOW CONTROL VALVE
	SELECTION VALVE
	PARTICULATE FILTER
	PUMP
	FLOWMETER
	PRESSURE GAUGE
	RECORDER
	TEMPERATURE SENSOR

FIGURE B90-7 EXHAUST GAS ANALYTICAL SYSTEM

(b) *Major component description.* The exhaust gas analytical system for HC, CO, CO<sub>2</sub>, and NO<sub>x</sub>, Figure B90-7, consists of a flame ionization detector (FID) (heated, 235° ± 15°F (113° ± 8°C) for methanol-fueled vehicles) for the determination of hydrocarbons, non-dispersive infrared analyzers (NDIR) for the determination of carbon monoxide and carbon dioxide and a chemiluminescence analyzer (CL) for the determination of oxides of nitrogen. A heated flame ionization detector (HFID) is used for the continuous determination of hydrocarbons from petroleum-fueled diesel vehicles (may also be used with methanol-fueled diesel vehicles), Figure B90-5 (or B90-6). The analytical system for methanol consists of a gas chromatograph (GC) equipped with a flame ionization detector. The analysis for formaldehyde is performed using high pressure liquid chromatography (HPLC) of 2,4-dinitrophenylhydrazine (DNPH) derivatives using ultraviolet (UV) detection. The exhaust gas analytical system shall conform to the following requirements:

(1) The CL requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(2) The carbon monoxide (CO) NDIR analyzer may require a sample conditioning column containing CaSO<sub>4</sub>, or indicating silica gel to remove water vapor and containing ascarite to remove carbon dioxide from the CO analysis stream.

(i) If CO instruments which are essentially free of CO<sub>2</sub> and water vapor interference are used, the use of the conditioning column may be deleted, see §§ 86.122 and 86.144.

(ii) A CO instrument will be considered to be essentially free of CO<sub>2</sub> and water vapor interference if its response to a mixture of 3 percent CO<sub>2</sub> in N<sub>2</sub> which has been bubbled through water at room temperature produces an equivalent CO response, as measured on the most sensitive CO range, which is less than 1 percent of full scale CO concentration on ranges above 300 ppm full scale or less than 3 ppm on ranges below 300 ppm full scale, see § 86.122.

(3) For petroleum-fueled diesel vehicles (and if selected, for methanol-fueled diesel vehicles) a continuous hydrocarbon sample shall be measured using a heated analyzer train as shown in Figure B90-5 (or B90-6). The train shall include a heated probe, a heated continuous sampling line, a heated particulate filter and a heated hydrocarbon instrument (HFID) complete with heated pump, filter and flow control system.

(i) The response time of this instrument shall be less than 1.5 seconds for 90 percent of full scale response.

(ii) The continuous HC sample system may use an "overflow" zero and span system; see § 86.140-82(b)(4). In this type of system (figures B82-3A and B82-4A), zero or span gas is introduced into the heated sample line at a flow rate that exceeds the sample flow rate to the HFID. The excess gas overflows the sample probe into the dilution tunnel. This method assures that the reference gas enters HFID in the same concentration as the injected reference gas and at the same rate as the sample exhaust gas. In addition to zero and span checks, it may also be used to calibrate the HC analyzer per § 86.121-82(b). The overflow gas flow rate into the sample line shall be greater than 125 percent of the HFID flow rate with the CVS blower operating. A lower flow

rate may be used if it has been experimentally shown to produce equivalent results and current documentation is maintained. The overflow gases shall enter the heated sample line as close as practicable to the outside surface of the dilution tunnel.

(iii) No other analyzers may draw a sample from the continuous HC sample probe, line or system, unless a common sample pump is used of all analyzers and the single sample line system design reflects good engineering practice.

(iv) Sample transport time from sampling point to inlet of instrument shall be less than 4 seconds.

(v) For petroleum-fueled diesel vehicles, the sample line and filter shall be heated to maintain a sample gas temperature of 375° ± 10°F (191° ± 6°C) before the filter and before the HFID.

(vi) For methanol-fueled diesel vehicles, the sample line and filter shall be heated to maintain a sample gas temperature of 235° ± 15°F (113° ± 8°C) before the filter and before the HFID.

(c) *Other analyzers and equipment.* Other types of analyzers and equipment may be used if shown to yield equivalent results and if approved in advance by the Administrator.

39. Section 86.113-90 of Subpart B is revised to read as follows:

#### § 86.113-90 Fuel specifications.

(a) *Otto-cycle test fuel.* (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing of petroleum fueled Otto-cycle vehicles. Gasoline having the following specification or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust and evaporative testing except that octane specifications do not apply.

Item		ASTM test method No.	Value
Octane, research.....	min.	D2699	93
Sensitivity.....	min.		7.5
Lead (organic).....	g/U.S. gal. (g/liter)	D3237	0.050 (0.013)
Distillation range:			
IBP <sup>2</sup> .....	*F (*C)	D86	75-85 (23.9-35)
10 pct. point.....	*F (*C)	D86	120-135 (48.9-57.2)
50 pct. point.....	*F (*C)	D86	200-230 (93.3-110)
90 pct. point.....	*F (*C)	D86	300-325 (148.9-162.8)
EP (max.).....	*F (*C)	D86	415 (212.8)
Sulfur, weight pct.....	max.	D1266	0.10
Phosphorus, max.....	g/U.S. gal. (g/liter)	D3231	0.005 (0.0013)
RVP <sup>3,4</sup> .....	psi (kPa)	D3231	8.7-9.2 (60.0-63.4)

Item		ASTM test method No.	Value
Hydrocarbon composition:			
Olefins.....	max. pct.	D1319	10
Aromatics.....	max. pct.	D1319	35
Saturates.....		D1319	5

<sup>1</sup> Maximum.  
<sup>2</sup> For testing at altitudes above 1,219 m (4,000 ft) the specified range is 75°-105 °F (23.9°-40.6 °C).  
<sup>3</sup> For testing which is unrelated to evaporative emission control, the specified range is 8.0-9.2 psi (55.2-63.4 kPa).  
<sup>4</sup> For testing at altitudes above 1,219 m (4,000 ft) the specified range is 7.9-9.2 psi (54.5-63.4 kPa).  
<sup>5</sup> Remainder

(2) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation for petroleum-fueled Otto-cycle vehicles. Leaded gasoline will not be used in service accumulation.

(i) The octane rating of the gasoline used shall be no higher than 1.0 Research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the Research octane number minus the Motor octane number.

(ii) The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(3) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled Otto-cycle vehicles shall be representative of commercially

available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (a)(3) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(4) Other methanol fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraph (a)(3) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications

must be provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraphs (a)(2), (a)(3), and (a)(4) of this section shall be reported in accordance with § 86.090-21(b)(3).

(b) Diesel test fuel. (1) The petroleum fuels employed for testing diesel vehicles shall be clean and bright, with pour and cloud points adequate for operability. The petroleum fuel may contain nonmetallic additives as follows: cetane improver, metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, dispersant and biocide.

(2) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emission testing. The grade of petroleum fuel recommended by the engine manufacturer, commercially designated as "Type 2-D" grade diesel, shall be used.

Item		ASTM test method No.	Type 2-D
Cetane number.....		D613	42-50
Distillation range:			
IBP.....	°F	D86	340-400
	(°C)		(171.1-204.4)
10 pct. point.....	°F	D86	400-460
	(°C)		(204.4-237.8)
50 pct. point.....	°F	D86	470-540
	(°C)		(243.3-282.2)
90 pct. point.....	°F	D86	550-610
	(°C)		(287.8-321.1)
EP.....	°F	D86	580-660
	(°C)		(304.4-348.9)
Gravity.....	°API	D287	33-37
Total sulfur.....	pct.	D129, or D2622	0.2-0.5
Hydrocarbon composition:			
Aromatics, min.....	pct.	D1319	27
Paraffins, naphthenes, olefins.....			1
Flashpoint, min.....	°F	D93	130
	(°C)		(54.4)
Viscosity, centistokes.....		D445	2.0-3.2

<sup>1</sup> Remainder

(3) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications

approved by the Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel recommended

by the engine manufacturer, commercially designated as "Type 2-D" grade diesel fuel, shall be used.

Item		ASTM test method No.	Type 2-D
Cetane number.....		D613	38-58
Distillation range: 90 pct. point.....	°F (°C)	D86	430-630 (221.1-332.2)
Gravity.....		D287	30-42
Total sulfur.....	°API min., pct.	D129 or D2622	0.20
Flashpoint, min.....	°F (°C)	D93	130 (54.4)
Viscosity.....	centistokes	D455	1.5-4.5

(4) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled diesel vehicles shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (b)(4) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(5) Other fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraphs (b)(2) and (b)(3) or (b)(4) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(6) The specification range of the fuels to be used under paragraphs (b)(2), (b)(3), (b)(4), and (b)(5) of this section shall be reported in accordance with § 86.090-21(b)(3).

(c) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

(d) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.*

(1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel vehicles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (d)(1) of this section shall be reported in accordance with § 86.090-21(b)(3).

40. A new § 86.116-90 is added to Subpart B, to read as follows:

**§ 86.116-90 Calibrations, frequency and overview.**

(a) Calibrations shall be performed as specified in § 86.117 through § 86.126.

(b) At least yearly or after any maintenance which could alter background emission levels, evaporative enclosure background emission measurements shall be performed.

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzers (both evaporative and exhaust instruments), carbon dioxide analyzer, carbon monoxide analyzer, oxides of nitrogen analyzer, methanol analyzer, and formaldehyde analyzer (certain analyzers may require more frequent calibration depending on particular equipment and uses).

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration) the monthly calibration need not be performed.

(3) Perform a hydrocarbon and methanol (if methanol fuel is used) retention check and calibration on the evaporative emission enclosure.

(4) Calibrate the gas meters or flow instrumentation used for providing total flow measurement for particulate sampling.

(d) At least weekly or after any maintenance which could alter

calibration, the following calibrations and checks shall be performed:

(1) Check the oxides of nitrogen converter efficiency, and

(2) Perform a CVS system verification.

(3) Run a performance check on the dynamometer. This check may be omitted if the dynamometer has been calibrated within the preceding month.

(e) The CVS positive displacement pump or Critical Flow Venturi shall be calibrated following initial installation, major maintenance, or as necessary when indicated by the CVS system verification (described in § 86.119).

(f) Sample conditioning columns, if used in the CO analyzer train, should be checked at a frequency consistent with observed column life or when the indicator of the column packing begins to show deterioration.

41. A new § 86.117-90 is added to Subpart B, to read as follows:

**§ 86.117-90 Evaporative emission enclosure calibrations.**

The calibration of the evaporative emission enclosure consists of three parts: initial and periodic determination of enclosure background emissions (hydrocarbons and methanol); initial determination of enclosure internal volume; and periodic hydrocarbon and methanol retention check and calibration. Methanol measurements may be omitted when methanol-fueled vehicles will not be tested in the evaporative enclosure.

(a) *Initial and periodic determination of enclosure background emissions.* Prior to its introduction into service, annually thereafter, and after any repair which can affect the enclosure background emissions, the enclosure shall be checked to determine that it does not contain materials which will themselves emit hydrocarbons or methanol. \*Proceed as follows:

\*Note: When methanol as well as hydrocarbons are present in the evaporative enclosure, the HFID hydrocarbon concentration measurement includes the partial response of the HFID to methanol plus the hydrocarbons. Determination of the HFID response to methanol, § 86.121, prior to its

being placed in service is required for the determination of hydrocarbons.

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, background methanol, temperature, and barometric pressure. These are the initial readings  $C_{HCl}$ ,  $C_{CH_3OH}$ , and  $P_{BI}$ ,  $T_i$  for the enclosure background determination.

(5) Allow the enclosure to stand undisturbed without sampling for four hours.

(6) Measure the hydrocarbon concentration on the same FID and the methanol level. These are the final concentrations,  $C_{HCl}$  and  $C_{CH_3OH}$ . Also measure final temperature and barometric pressure.

(7) Calculate the mass change of methanol, hydrocarbons, and hydrocarbons plus methanol in the enclosure according to the equations in paragraph (d) of this section. The enclosure background emissions (hydrocarbons plus methanol) shall not be greater than 0.4g for the 4 hours.

(b) *Initial determination of enclosure internal volume.* Prior to its introduction into service the enclosure internal volume shall be determined by the following procedure:

(1) Carefully measure the internal length, width and height of the enclosure, accounting for irregularities

(such as braces) and calculate the internal volume.

(2) Perform an enclosure calibration check according to paragraphs (c) (1) through (7) of this section.

(3) If the calculated mass does not agree within 2 percent of the injected propane mass, then corrective action is required.

(c) *Hydrocarbon and methanol retention check and calibration.* The hydrocarbon and methanol (if the enclosure is used for methanol-fueled vehicles) retention check provides a check upon the calculated volume and also measures the leak rate. Prior to its introduction into service and at least monthly thereafter the enclosure leak rate shall be determined as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, background methanol, temperature, and barometric pressure. These are the initial readings  $C_{HCl}$ ,  $C_{CH_3OH}$ ,  $T_i$  and  $P_{BI}$  for the enclosure calibration.

(5) Inject into the enclosure a known quantity of pure propane (4g is a convenient quantity) and a known quantity of pure methanol (4g is a convenient quantity) in gaseous form; i.e., at a temperature of at least 150–155°F (65–68°C). The propane and methanol may be measured by volume flow or by mass measurement. The method used to measure the propane

and methanol shall have an accuracy and precision of  $\pm 0.5$  percent of the measured value.

(6) After a minimum of 5 minutes of mixing, analyze the enclosure atmosphere for hydrocarbon and methanol content, also record temperature and pressure. These measurements are the final readings for the enclosure calibration as well as the initial readings for the retention check.

(7) To verify the enclosure calibration, calculate the mass of propane and the mass of methanol using the measurements taken in steps (4) and (6). See paragraph (d) of this section. This quantity must be within  $\pm 2$  percent of that measured in step 5 above.

(8) Allow the enclosure to remain sealed for a minimum of 4 hours, analyze the enclosure atmosphere for hydrocarbon and methanol content; record temperature and barometric pressure. These are the final readings for the hydrocarbon and methanol retention check.

(9) Calculate, using the equations in paragraph (d) of this section and the readings taken in step (8), the hydrocarbon and methanol mass. It may not differ by more than 4 percent of the value in step (6).

(d) *Calculations.* (1) The calculation of net methanol and hydrocarbon mass change is used to determine enclosure background and leak rate. It is also used to check the enclosure volume measurements. The methanol mass change is calculated from the initial and final methanol samples, temperature and pressure according to the following equation:

$$M_{CH_3OH} = \left( \frac{V \times C_{MR}}{A_{MR}} \right) \times \left[ \left( \frac{T_{Ef}}{V_{Ef} \times T_{SHEDf}} \right) \left( A_{MS1f} \times AV_{1f} \right) + \left( A_{MS2f} \times AV_{2f} \right) - \left( \frac{T_{Ei}}{V_{Ei} \times T_{SHEDi}} \right) \left( A_{MS1i} \times AV_{1i} \right) + \left( A_{MS2i} \times AV_{2i} \right) \right]$$

Where:

(i)  $M_{CH_3OH}$  = Methanol mass change,  $\mu\text{g}$ .

(ii)  $V$  = Enclosure volume,  $\text{ft}^3$ , as measured in paragraph (b)(1) of this section.

(iii)  $C_{MR}$  = Concentration of methanol in standard sample for calibration of GC,  $\mu\text{g}/\text{ml}$ .

(iv)  $A_{MR}$  = GC peak area of standard sample.

(v)  $T_E$  = Temperature of sample withdrawn,  $^{\circ}\text{R}$ .

(vi)  $T_{SHED}$  = Temperature of SHED,  $^{\circ}\text{R}$ .

(vii)  $V_E$  = Volume of sample withdrawn,  $\text{ft}^3$ .

- (viii)  $P_B$  = Barometric pressure at time of sampling, in. Hg.
- (ix)  $A_{MS}$  = GC peak area of test sample.
- (x)  $AV$  = Volume of absorbing reagent in impinger (ml).
- (xi)  $i$  = Initial sample.

- (xii)  $f$  = Final sample.
- (xiii) 1 = First impinger
- (xiv) 2 = Second impinger.
- (2) The hydrocarbon mass change is calculated from the initial and final FID

readings of hydrocarbon concentration, methanol concentration with FID response to methanol, temperature, and pressure according to the following equation:

$$M_{HC} = kV \times 10^{-4} \left( \frac{(C_{HCf} - rC_{CH_3OHf}) \times P_{Bf}}{T_f} - \frac{(C_{HCi} - rC_{CH_3OHi}) \times P_{Bi}}{T_i} \right)$$

Where:

(i)  $M_{HC}$  = Hydrocarbon mass change, g.

(ii)  $C_{HC}$  = FID hydrocarbon concentration as ppm carbon including FID response to methanol in the sample.

(iii)  $C_{CH_3OH}$  = Methanol concentration as ppm carbon

$$= \left( \frac{1.501 \times 10^{-3} C_{MR} \times T_E}{A_{MR} \times P_B \times V_E} \right) [(A_{S1} \times AV_1) + (A_{S2} \times AV_2)]$$

- (iv)  $V$  = Enclosure volume  $ft^3$  ( $m^3$ ), as measured in paragraph (b)(1) of this section.
- (v)  $r$  = FID response factor to methanol.
- (vi)  $P_B$  = Barometric pressure, in. Hg. (kPa).
- (vii)  $T$  = Enclosure ambient temperature,  $^{\circ}R$  ( $^{\circ}K$ ).
- (viii)  $i$  = Indicates initial reading.
- (ix)  $f$  = Indicates final reading.
- (x) (A)  $k = 3.05$ .
- (B) For SI units,  $k = 17.60$ .

Note:—Hydrocarbon concentration is stated in ppm carbon, that is, ppm propane  $\times$  3. Expressions in parentheses are for SI units.

42. A new § 86.119-90 is added to Subpart B, to read as follows:

§ 86.119-90 CVS calibration.

The CVS is calibrated using an accurate flowmeter and restrictor valve. Measurements of various parameters are made and related to flow through the unit. Procedures used by EPA for both PDP and CFV are outlined below. Other procedures yielding equivalent results may be used if approved in advance by the Administrator. After the calibration curve has been obtained, verification of the entire system can be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true

mass injected. An indicated error does not necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system, e.g., analyzer calibration. A verification procedure is found in paragraph (c) of this section.

(a) *PDP calibrations.* (1) The following calibration procedure outlines the equipment, the test configuration, and the various parameters which must be measured to establish the flow rate of the CVS pump. All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump. The calculated flow rate  $ft^3/min$  (at pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value on a specific combination of pump parameters. The linear equation which relates the pump flow and the correlation function is then determined. In the event that a CVS has a multiple speed drive, a calibration for each range used must be performed.

(2) This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Three conditions must be maintained to assure the accuracy and integrity of the calibration curve. First,

the pump pressures should be measured at taps on the pump rather than at the external piping on the pump inlet and outlet. Pressure taps that are mounted at the top center and bottom center of the pump drive headplate are exposed to the actual pump cavity pressures, and therefore reflect the absolute pressure differentials. Secondly, temperature stability must be maintained during the calibration. The laminar flowmeter is sensitive to inlet temperature oscillations which cause the data points to be scattered. Gradual changes ( $\pm 2^{\circ}F$  ( $1.1^{\circ}C$ )) in temperature are acceptable as long as they occur over a period of several minutes. Finally, all connections between the flowmeter and the CVS pump must be absolutely void of any leakage.

(3) During an exhaust emission test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

(4) Connect a system as shown in Figure B90-8. Although particular types of equipment are shown, other configurations that yield equivalent results may be used if approved in advance by the Administrator. For the system indicated, the following data with given accuracy are required:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected).....	$P_B$	in. Hg (kPa).....	$\pm 0.01$ in. Hg ( $\pm 0.034$ kPa)
Ambient temperature.....	$T_A$	$^{\circ}F$ ( $^{\circ}C$ ).....	$\pm 0.5^{\circ}F$ ( $\pm 0.28^{\circ}C$ )
Air temperature into LFE.....	ETI	$^{\circ}F$ ( $^{\circ}C$ ).....	$\pm 0.25^{\circ}F$ ( $\pm 0.14^{\circ}C$ )
Pressure depression upstream of LFE.....	EPI	in. $H_2O$ (kPa).....	$\pm 0.05$ in. $H_2O$ ( $\pm 0.012$ kPa)
Pressure drop across the LFE matrix.....	EDP	in. $H_2O$ (kPa).....	$\pm 0.005$ in. $H_2O$ ( $\pm 0.001$ kPa)
Air temperature at CVS pump inlet.....	PTI	$^{\circ}F$ ( $^{\circ}C$ ).....	$\pm 0.5^{\circ}F$ ( $\pm 0.3^{\circ}C$ )
Pressure depression at CVS pump inlet.....	PPI	in. fluid (kPa).....	$\pm 0.05$ in. fluid ( $\pm 0.022$ kPa)

## CALIBRATION DATA MEASUREMENTS—Continued

Parameter	Symbol	Units	Tolerances
Specific gravity of manometer fluid (1.75 oil).....	Sp. Gr.		
Pressure head at CVS pump outlet.....	PPO	in. fluid (kPa) .....	±0.05 in. fluid (±0.022 kPa)
Air temperature at CVS pump outlet (optional).....	PTO	*F(*C).....	±0.5°F (±0.28°C)
Pump revolutions during test period.....	N	Revs .....	±1 Rev.
Elapsed time for test period.....	t	sec.....	±0.05 sec.

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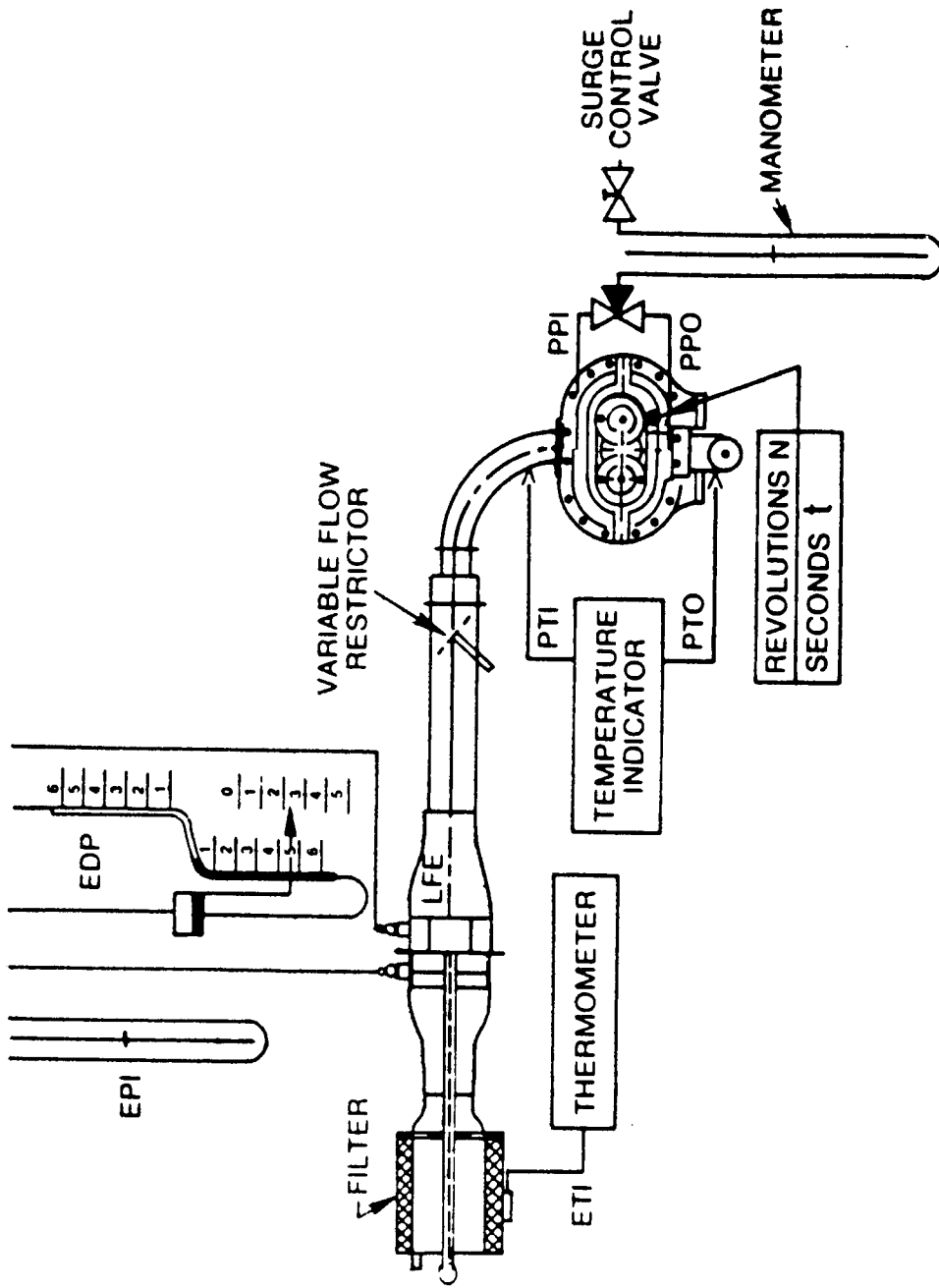


FIGURE B90-8 PDP-CVS CALIBRATION CONFIGURATION

BILLING CODE 6550-50-C



(5) After the system has been connected as shown in Figure B90-8, set the variable restrictor in the wide open position and run the CVS pump for 20 minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression (about 4 in. H<sub>2</sub>O (1.0 kPa) that will yield a minimum of six data points for the total calibration. Allow the system to stabilize for 3 minutes and repeat the data acquisition.

(7) Data analysis:

(i) The air flow rate, Q<sub>a</sub>, at each test point is calculated in standard cubic feet per minute from the flowmeter data using the manufacturer's prescribed method.

(ii) The air flow rate is then converted to pump flow, V<sub>o</sub>, in cubic feet per revolution at absolute pump inlet temperature and pressure:

$$V_o = (Q_a/n) \times (T_o/528) \times (29.92/P_o)$$

Where:

(A) V<sub>o</sub> = Pump flow ft<sup>3</sup>/rev (m<sup>3</sup>/rev) at T<sub>p</sub>, P<sub>p</sub>.

(B) Q<sub>a</sub> = Meter air flow rate in standard cubic feet per minute, standard conditions are 68 °F, 29.92 in. Hg (20 °C, 101.3 kPa).

(C) n = Pump speed in revolutions per minute.

(D)(1) T<sub>p</sub> = Pump inlet temperature, °R(°K) = PTI + 460.

(2) For SI units, T<sub>p</sub> = PTI + 273.

(E)(1) P<sub>p</sub> = Absolute pump inlet pressure, in. Hg. (kPa) = P<sub>B</sub> - PPI (SP.GR./13.57).

(2) For SI units, P<sub>p</sub> = P<sub>B</sub> - PPI.

Where:

(F) P<sub>B</sub> = barometric pressure, in. Hg. (kPa).

(G) PPI = Pump inlet depression, in. fluid (kPa).

(H) SP.GR. = Specific gravity of manometer fluid relative to water.

(iii) The correlation function at each test point is then calculated from the calibration data:

$$X_o = \frac{1}{n} \sqrt{\frac{\Delta P_p}{P_e}}$$

Where:

(A) X<sub>o</sub> = correlation function.

(B) ΔP<sub>p</sub> = the pressure differential from pump inlet to pump outlet, in. Hg (kPa) = P<sub>o</sub> - P<sub>p</sub>.

(C)(1) P<sub>o</sub> = Absolute pump outlet pressure, in. Hg. (kPa) = P<sub>B</sub> + PPO (SP.GR./13.57).

(2) For SI units, P<sub>o</sub> = P<sub>B</sub> + PPO.

Where:

(D) PPO = Pressure head at pump outlet, in. fluid (kPa).

(iv) A linear least squares fit is performed to generate the calibration equations which have the forms:

$$V_o = D_o - M(X_o)$$

$$n = A - B(\Delta P_p)$$

D<sub>o</sub>, M, A, and B are the slope-intercept constants describing lines.

(8) A CVS system that has multiple speeds should be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values, D<sub>o</sub>, will increase as the pump flow range decreases.

(9) If the calibration has been performed carefully, the calculated values from the equation will be within ±0.50 percent of the measured value of V<sub>o</sub>. Values of M will vary from one pump to another, but values of D<sub>o</sub> for pumps of the same make, model, and range should agree within ±3 percent of each other. Particulate influx from use will cause the pump slip to decrease as reflected by lower values for M. Calibrations should be performed at pump start-up and after major maintenance to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

(b) CFV calibration. (1) Calibration of the CFV is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_v = \frac{K_v P}{\sqrt{T}}$$

Where:

(i) Q<sub>v</sub> = Flow.

(ii) K<sub>v</sub> = Calibration coefficient.

(iii) P = Absolute pressure.

(iv) T = Absolute temperature.

The calibration procedure described below establishes the value of the calibration coefficient at measured values of pressure, temperature and air flow.

(2) The manufacturer's recommended procedure shall be followed for calibrating electronic portions of the CFV.

(3) Measurements necessary for flow calibration are as follows:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected).....	P <sub>B</sub>	in. Hg (kPa)	±0.01 in. Hg (±0.034 kPa).
Air temperature, into flowmeter.....	ETI	°F(°C)	±0.25 °F(+0.14 °C).
Pressure depression upstream of LFE.....	EPI	in. H <sub>2</sub> O (kPa)	±0.05 in. H <sub>2</sub> O (±0.012 kPa).
Pressure drop across LFE matrix.....	EDP	in. H <sub>2</sub> O (kPa)	±0.005 in. H <sub>2</sub> O (±0.001 kPa).
Air flow.....	Q <sub>a</sub>	ft <sup>3</sup> /min (m <sup>3</sup> /min)	±0.5%.
CFV inlet depression.....	PPI	in. fluid (kPa)	±0.05 in. fluid (±0.022 kPa).
Temperature at venturi inlet.....	T <sub>v</sub>	°F(°C)	±0.5 °F (±0.28 °C).
Specific gravity of manometer fluid (1.75 oil).....	Sp. Gr.		

(4) Set up equipment as shown in Figure B90-9 and check for leaks. Any leaks between the flow measuring device and the critical flow venturi will seriously affect the accuracy of the calibration.

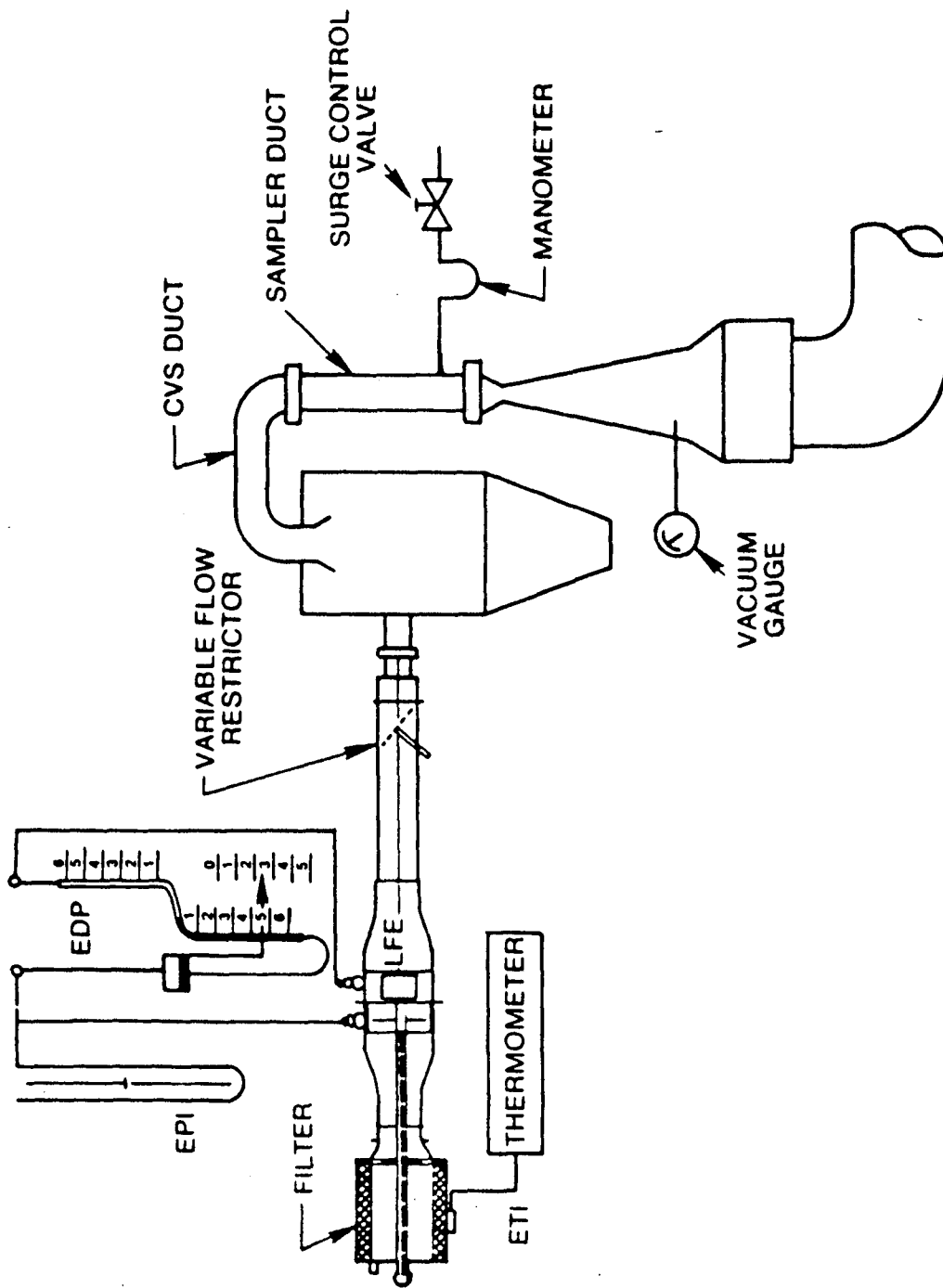


FIGURE B90-9 CFV-CVS CALIBRATION CONFIGURATION

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(5) Set the variable flow restrictor to the open position, start the blower, and allow the system to stabilize. Record data from all instruments.

(6) Vary the flow restrictor and make at least 8 readings across the critical flow range of the venturi.

(7) *Data analysis:* The data recorded during the calibration are to be used in the following calculations:

(i) The air flow rate,  $Q_s$ , at each test point is calculated in standard cubic feet per minute from the flow meter data using the manufacturer's prescribed method.

(ii) Calculate values of the calibration coefficient for each test point:

$$K_v = \frac{Q_s \sqrt{T_v}}{P_v}$$

Where:

- (A)  $Q_s$  = Flow rate in standard cubic feet per minute, standard conditions are 68 °F 29.92 in. Hg (20 °C, 101.3 kPa).  
 (B)  $T_v$  = Temperature at venturi inlet, °R(°K).  
 (C)(1)  $P_v$  = Pressure at venturi inlet, mm Hg (kPa) =  $P_B - PPI$  (SP.GR./13.57).

(2) For SI units,  $P_v = P_B - PPI$ .

Where:

- (D) PPI = Venturi inlet pressure depression, in. fluid (kPa).  
 (E) SP.GR. = Specific gravity of manometer fluid, relative to water.  
 (iii) Plot  $K_v$  as a function of venturi inlet pressure. For sonic flow  $K_v$  will have a relatively constant value. As pressure decreases (vacuum increases), the venturi becomes unchoked and  $K_v$  decreases. See Figure B90-10.

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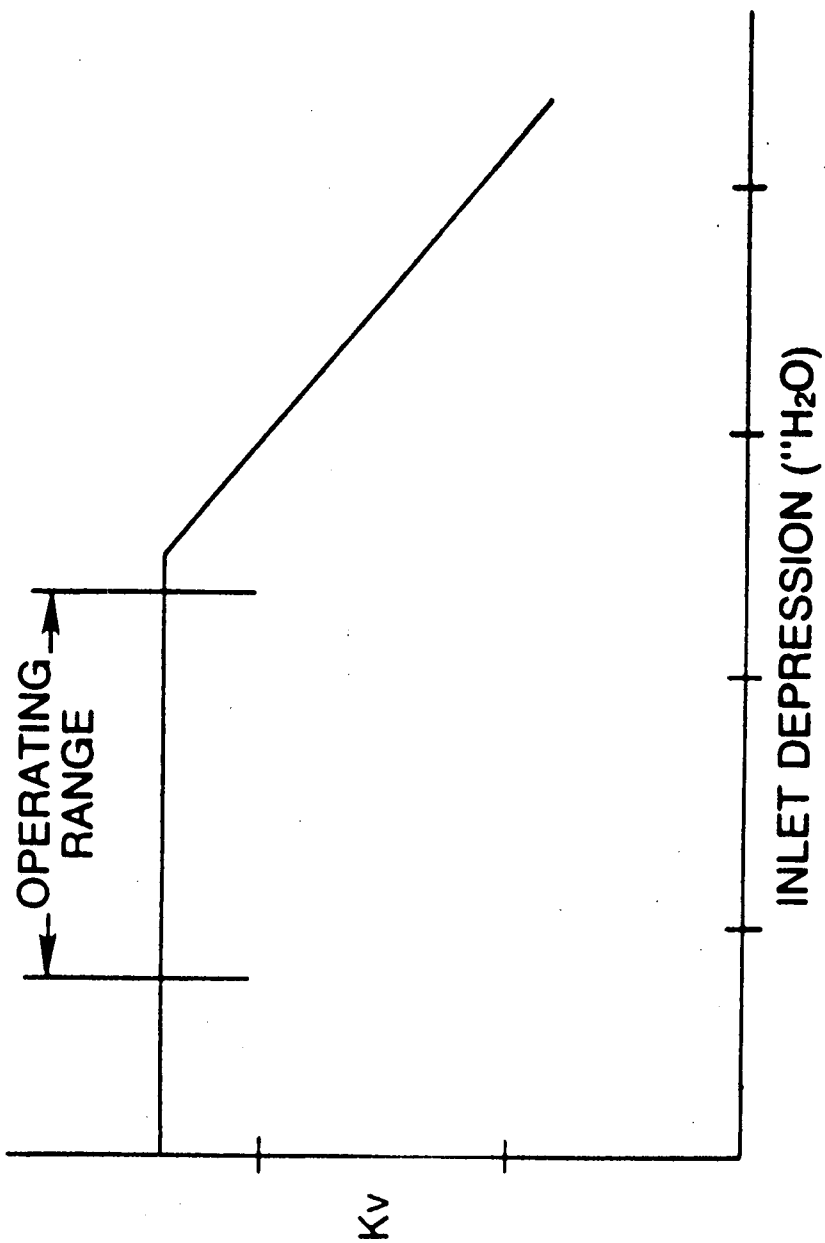


FIGURE B90 -10 SONIC FLOW CHOKING

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(iv) For a minimum of 8 points in the critical region calculate an average  $K_v$  and the standard deviation.

(v) If the standard deviation exceeds 0.3 percent of the average  $K_v$ , take corrective action.

(c) *CVS System Verification.* The following "gravimetric" technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system. If the CVS and analytical system will be used only in the testing of petroleum-fueled engines, the system verification may be performed using either propane or carbon monoxide. If the CVS and analytical system will be used with methanol-fueled vehicles as well as petroleum-fueled vehicles, system verification performance check must include a methanol check in addition to either the propane or carbon monoxide check. (Verification can also be accomplished by constant flow metering using critical flow orifice devices.)

(1) Obtain a small cylinder that has been charged with pure propane or carbon monoxide gas (CAUTION—carbon monoxide is poisonous). Obtain another small cylinder which has been charged with pure methanol if the system will be used for methanol-fueled vehicle testing. Since this cylinder will be heated to 150–155°F, care must be taken to ensure that the liquid volume of methanol placed in the cylinder does not exceed approximately one-half of the total volume of the cylinder.

(2) Determine a reference cylinder weight to the nearest 0.01 grams.

(3) Operate the CVS in the normal manner and release a quantity of pure propane or carbon monoxide into the system during the sampling period (approximately 5 minutes).

(4) Following the completion of step (3) above, continue to operate the CVS in the normal manner and release a quantity of pure methanol into the system during the sampling period (approximately 5 minutes).

(5) The calculations of § 86.144 are performed in the normal way, except in the case of propane. The density of propane (17.30 g/ft<sup>3</sup>/carbon atom (0.6109 kg/m<sup>3</sup>/carbon atom)) is used in place of the density of exhaust hydrocarbons. In the case of carbon monoxide, the density of 32.97 g/ft<sup>3</sup> (1.164 kg/m<sup>3</sup>) is used. In the case of methanol, the density of 37.71 g/ft<sup>3</sup> (1.332 kg/m<sup>3</sup>) is used.

(6) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.

(7) The cause for any discrepancy greater than ±2 percent must be found and corrected.

43. A new § 86.121–90 is added to Subpart B, to read as follows:

**§ 86.121–90 Hydrocarbon analyzer calibration.**

The hydrocarbon analyzers shall receive the following initial and periodic calibration. The HFID used with petroleum-fueled diesel vehicles shall be operated at a temperature of 375 °F ± 10 °F (191 ° ± 6 °C). The HFID used with methanol-fueled vehicles shall be operated at 235 ° ± 15 °F (113 ± 8 °C).

(a) *Initial and periodic optimization of detector response.* Prior to its introduction into service and at least annually thereafter, the FID and HFID hydrocarbon analyzers shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow the manufacturer's instructions or good engineering practice for instrument startup and basic operating adjustment using the appropriate FID fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer a propane in air mixture (methanol in air mixture for methanol-fueled vehicles when optional methanol calibrated HFID procedure is used during the 1990 through 1994 model year) with a propane (or methanol) concentration equal to approximately 90 percent of the most common operating range.

(3) One of the following is required for FID or HFID optimization:

(i) For all FIDs and HFIDs, the procedures specified by the applicable FID or HFID manufacturer.

(ii) For Beckman 400 FIDs only, implementation of the recommendations outlined in Society of Automotive Engineers (SAE) paper No. 770141, "Optimization of Flame Ionization Detector for Determination of Hydrocarbons in Diluted Automobile Exhaust"; author, Glenn D. Reschke.

(iii) For HFIDs only, the following peaking procedure. (A) With the fuel and air flow rates set in the manufacturer's recommendations, determine the analyzer response from the difference between the span-gas response and the zero gas response. Incrementally adjust the fuel flow above and below the manufacturer's specification. Record the span and zero response at these fuel flows. A plot of the difference between the span and zero response versus the fuel flow will be similar to the one shown in Fig. B87–11. Adjust the fuel-flow rate to the

highest setting that produces the maximum analyzer response.

(B) To determine the optimum air flow, use the fuel flow setting determined in paragraph (a)(3)(iii)(A) of this section and vary air flow.

(iv) Alternative procedures may be used if approved in advance by the Administrator.

(4) To determine the optimum air flow, use the FID fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, record them for future reference.

(b) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter the FID or HFID hydrocarbon analyzers shall be calibrated on all normally used instrument ranges, and, if testing methanol vehicles under the procedure described in § 86.107–90(a)(2)(ii) or § 86.110–90(a)(4), the methanol response factor shall be determined (paragraph (c) of this section). Use the same flow rate as when analyzing sample.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each normally used operating range with propane in air calibration gases (methanol in air as appropriate) having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(c) *FID response factor to methanol.* When the FID analyzer is to be used for the analysis of hydrocarbon samples containing methanol, the methanol response factor of the analyzer shall be established. The methanol response factor shall be determined at several concentrations in the range of concentrations in the exhaust sample.

(1) The bag sample of methanol for analysis in the FID shall be prepared using the apparatus shown in Figure B90–11. A known volume of methanol is injected, using a microliter syringe, into the heated mixing zone (250 °F(121 °C)) of the apparatus. The methanol is vaporized and swept into the sample bag with a known volume of zero grade air measured by a dry gas meter.

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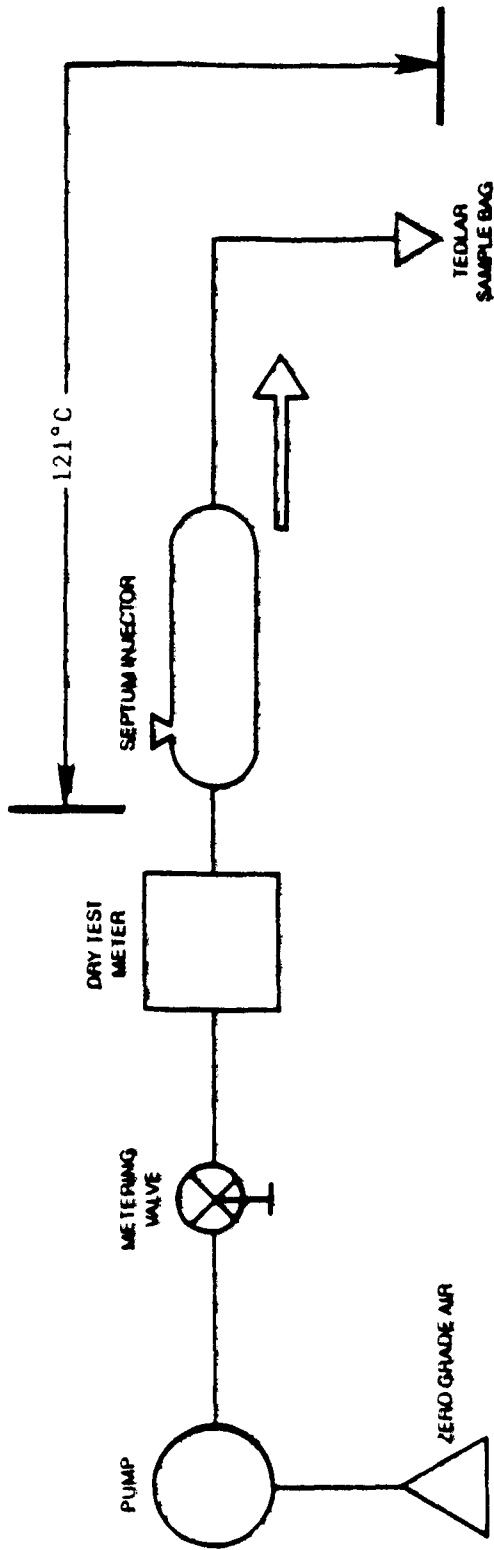


FIGURE B90-11 APPARATUS FOR PREPARATION OF FID METHANOL RESPONSE CALIBRATION MIX

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(2) The bag sample is analyzed using the FID.

(3) The FID response factor,  $r$ , is calculated as follows:

$$r = \text{FIDppm} / \text{SAMppm}$$

Where:

- (i)  $r$  = FID response factor.  
 (ii) FIDppm = FID reading in ppmC.  
 (iii) SAMppm = methanol concentration in the sample bag in ppmC

$$= \frac{0.02406 \times \text{Fuel injected} \times \text{Fuel density}}{\text{Air volume} \times \text{Mol. Wt. CH}_3\text{OH}}$$

Where:

- (iv) 0.02406 = Volume of one mole at 29.92 in. Hg and 68 °F,  $\text{m}^3$ .  
 (v) Fuel injected = Volume of methanol injected, ml.  
 (vi) Fuel density = Density of methanol, 0.7914 g/ml.  
 (vii) Air volume = Volume of zero grade air,  $\text{m}^3$ .  
 (viii) Mol. Wt.  $\text{CH}_3\text{OH}$  = 32.04.

44. A new § 86.126-90 is added to Subpart B, to read as follows:

**§ 86.126-90 Calibration of other equipment.**

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice. Specific equipment requiring calibration are the gas chromatograph and flame ionization detector used in measuring methanol and the high pressure liquid chromatograph (HPLC) and ultraviolet detector for measuring formaldehyde.

45. A new § 86.127-90 is added to Subpart B, to read as follows:

**§ 86.127-90 Test procedures; overview.**

The procedures described in this and subsequent sections are used to determine the conformity of vehicles with the standards set forth in Subpart A for light-duty vehicles and light-duty trucks.

(a) The overall test consists of prescribed sequences of fueling, parking and operating conditions. Vehicles are tested for any or all of the following emissions:

(1) Gaseous exhaust HC, CO,  $\text{NO}_x$ ,  $\text{CO}_2$  (for petroleum-fueled vehicles), plus  $\text{CH}_3\text{OH}$  and HCHO for methanol-fueled vehicles (measurement of  $\text{CH}_3\text{OH}$  and HCHO may be omitted for 1990 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus  $\text{CH}_3\text{OH}$ ).

(2) Particulates (diesel vehicles).

(3) Evaporative HC (for gasoline-fueled and methanol-fueled vehicles) and  $\text{CH}_3\text{OH}$  (for methanol-fueled

vehicles). A separate  $\text{CH}_3\text{OH}$  measurement may be omitted for 1990 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus  $\text{CH}_3\text{OH}$ .

The evaporative portion of the test procedure occurs before and after the exhaust emission test, and in some cases, during the exhaust emission test.

(b) The Otto-cycle exhaust emission test is designed to determine gaseous hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen mass emissions from gasoline-fueled and methanol-fueled vehicles as well as methanol and formaldehyde from methanol-fueled Otto-cycle vehicles while simulating an average trip in an urban area of 7.5 miles (12.1 kilometers). The test consists of engine startups and vehicle operation on a chassis dynamometer, through a specified driving schedule. A proportional part of the diluted exhaust is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler.

(c) The diesel exhaust emission test is designed to determine particulate and gaseous mass emissions during a test similar to the test in § 86.127(b). For petroleum-fueled vehicles, diluted exhaust is continuously analyzed for total hydrocarbons using a heated sample line and analyzer. The other gaseous emissions, CO,  $\text{CO}_2$  and  $\text{NO}_x$  are collected continuously for analysis as in § 86.127(b). For methanol-fueled vehicles, hydrocarbons, methanol, formaldehyde, CO,  $\text{CO}_2$ , and  $\text{NO}_x$  are collected continuously for analysis as in § 86.127(b). Hydrocarbons, methanol and formaldehyde are collected using heated sample lines, and a heated FID is used for hydrocarbons analyses. Simultaneous with the gaseous exhaust collection and analysis, particulates from a proportional part of the diluted exhaust are collected continuously on a filter. The mass of particulate is determined by the procedure described in § 86.139. This testing requires a dilution tunnel as well as the constant volume sampler.

(d) The evaporative emission test (gasoline-fueled vehicles and methanol-fueled vehicles) is designed to determine hydrocarbon and methanol evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving, and hot soaks during parking. It is associated with a series of events representative of a motor vehicle's operation, which result in hydrocarbon and/or methanol vapor losses. The test procedure is designed to measure:

(1) Diurnal breathing losses resulting from daily temperature changes, measured by the enclosure technique;

(2) Running losses from suspected sources (if indicated by engineering analysis or vehicle inspection) resulting from a simulated trip on a chassis dynamometer, measured by carbon traps; and

(3) Hot soak losses, which result when the vehicle is parked and the hot engine is turned off, measured by the enclosure technique.

(e) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.088-25.

46. A new § 86.131-90 is added to Subpart B, to read as follows:

**§ 86.131-90 Vehicle preparation.**

(a) For gasoline-fueled and methanol-fueled vehicles prepare the fuel tank(s) for recording the temperature of the prescribed test fuel at the approximate mid-volume of the fuel.

(b) Provide additional fittings and adapters, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

47. A new § 86.132-90 is added to Subpart B, to read as follows:

**§ 86.132-90 Vehicle preconditioning.**

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be drained through the provided fuel tank(s) drain(s) and filled to the prescribed "tank fuel volume" with the specified test fuel, § 86.113. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one Urban Dynamometer Driving Schedule test procedure, see § 86.115 and Appendix I. A test vehicle may not be used to set dynamometer horsepower.

(3) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the Administrator.

(4) The Administrator may also choose to conduct or require the conduct of additional preconditioning to insure

that the evaporative emission control system is stabilized in the case of gasoline-fueled and methanol-fueled vehicles, or to insure that the exhaust system is stabilized in the case of petroleum-fueled and methanol-fueled diesel vehicles.

(i) *Gasoline-fueled and methanol-fueled vehicles.* (A) The additional preconditioning shall consist of an initial one hour minimum soak and, one, two, or three driving cycles of the UDDS, as described in (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off.

(B) The vehicle may be driven off the dynamometer following each UDDS for the soak period.

(ii) *Petroleum-fueled diesel vehicles.* The preconditioning shall consist of either of the following:

(A) The additional preconditioning described in paragraph (a)(4)(i) of this section; or

(B) For abnormally treated vehicles, as defined in § 86.085-2, two Highway Fuel Economy Driving Schedules, found in Part 600 Appendix I, run in immediate succession, with the road load power set at twice the value obtained from § 86.129-80.

(b) Within five minutes of completion of preconditioning, the vehicle shall be driven off the dynamometer and parked. The vehicle shall be stored for not less than 12 hours nor for more than 36 hours prior to the cold start exhaust test. (Gasoline-fueled and methanol-fueled vehicles undergo a one-hour diurnal heat build prior to the cold start exhaust test. A wait of up to one hour is permitted between the end of the diurnal heat build and the beginning of the cold start exhaust test. See § 86.130 and Figure B79-5.)

(c) Vehicles to be tested for evaporative emissions shall be processed in accordance with procedures in §§ 86.133 through 86.138. Vehicles to be tested for exhaust emissions only shall be processed according to § 86.133 through § 86.137.

48. A new § 86.133-90 is added to Subpart B, to read as follows:

**§ 86.133-90 Diurnal breathing loss test.**

(a)(1) Following vehicle preparation and vehicle preconditioning procedures described in §§ 86.131 and 86.132 the test vehicle shall be allowed to soak for a period of not less than 12 or more than 36 hours prior to the exhaust emission test. The diurnal test shall start not less than 10 or more than 35 hours after the end of the preconditioning procedure. The start of the exhaust test shall follow

the end of the diurnal test within one hour.

(2) Gasoline-fueled and methanol-fueled vehicles to be tested for exhaust emissions only shall undergo the diurnal heat build. Since no evaporative measurements are necessary, an evaporative enclosure is not required.

(b) The evaporative emission enclosure shall be purged for several minutes immediately prior to the test.

Note: If at any time the concentration of hydrocarbons, of methanol or of methanol and hydrocarbons exceeds 15,000 ppm C the enclosure should be immediately purged. The concentration provides a 4:1 safety factor of hydrocarbons and methanol against the lean flammability limit.

(c) The FID (or HFID) hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(d) Impingers charged with known volumes of pure deionized water shall be placed in the methanol sampling system (methanol-fueled vehicles only).

(e) If not already on, evaporative enclosure mixing fan shall be turned on at this time.

(f) Immediately prior to the diurnal breathing loss test, the fuel tank(s) of the prepared vehicle shall be drained and recharged with the specified test fuel, § 86.113, to the prescribed "tank fuel volume," defined in § 86.078-2. The temperature of the fuel prior to its delivery to the fuel tank shall be between 45° and 60° F (7.2° C and 16° C). The fuel tank cap(s) is not installed until the diurnal heat build begins.

(g) The test vehicle, with the engine shut off, shall be moved into the evaporative emission enclosure, the test vehicle windows and luggage compartment(s) shall be opened, the fuel tank temperature sensor shall be connected to the temperature recording system, and, if required, the heat source shall be properly positioned with respect to the fuel tank(s) and/or connected to the temperature controller.

(h) The temperature recording system shall be started.

(i) The fuel may be artificially heated to the starting diurnal temperature.

(j) When the fuel temperature recording system reaches at least 58° F (14° C), immediately:

(1) Install fuel tank cap(s).

(2) Turn off purge blowers, if not already off at this time.

(3) Close and seal enclosure doors.

(k) When the fuel temperature recording system reaches 60° ± 2° F (16° ± 1.1° C), immediately:

(1) Analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration,  $C_{\text{HC}}$ , § 86.143.

(2) Simultaneously with initiation of the hydrocarbon analysis, initiate collection of the methanol sample by drawing a sample from the enclosure through the sampling system for four minutes. This is the initial methanol measurement from which methanol concentration  $C_{\text{CH}_3\text{OH}}$  and mass are calculated. Remove impingers and replace with freshly charged clean impingers which will be used to collect the final methanol sample.

(3) Start diurnal heat build and record time. This commences the 60 ± 2 minute test period.

(1) The fuel shall be heated in such a way that its temperature change conforms to the following function to within ± 3° F (± 1.6° C):

$$(1) F = T_0 + 0.4t.$$

$$(2) \text{For SI units, } C = T_0 + (2/9)t.$$

Where:

(3) F = fuel temperature, °F.

(4) C = fuel temperature, °C.

(5) t = time since beginning of test, minutes.

(6)  $T_0$  = initial temperature.

After 60 ± 2 minutes of heating, the fuel temperature rise shall be 24° ± 1° F (13.4° C ± 0.5° C).

(m) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the diurnal test.

(n) The end of the diurnal breathing loss test occurs 60 ± 2 minutes after the heat build begins, paragraph (j)(2). Analyze the enclosure atmosphere for hydrocarbons and record. This is the final (time = 60 minutes) hydrocarbon concentration,  $C_{\text{HC}}$ , § 86.143. The time (or elapsed time) of this analysis shall be recorded.

(o) Simultaneously with the start of the hydrocarbon analysis, initiate collection of the methanol sample. Sample for 4.0 ± 0.5 minutes. This is the final methanol sample.

(p) *Alternate method for methanol sampling.* Since sample times of longer than four minutes may be necessary in order to collect an adequate and representative sample of methanol at the end of a test (when SHED concentrations are usually increasing rapidly), it may be necessary to rapidly collect the methanol sample in a bag and then bubble the bag sample through the impingers at the specified flow rate. The time elapsed between collection of the bag sample and flowing through the impingers should be minimized in order to prevent any losses. This alternative must be adopted if the four minute sample period is inadequate to collect a sample of sufficient concentration to allow accurate GC analysis.



(q) Once the final methanol sample has been collected, the heat source shall be turned off and the enclosure doors unsealed and opened.

(r) The heat source shall be moved away from the vehicle, if required, and/or disconnected from the temperature controller, the fuel tank temperature sensor shall be disconnected from the temperature recording system, the test vehicle windows and luggage compartments may be closed and the test vehicle, with the engine shut off, shall be removed from the evaporative emission enclosure.

(s) For vehicles with multiple tanks, the largest tank shall be designated as the primary tank and shall be heated in accordance with the procedures described in paragraph (1) of this section. All other tanks shall be designated as auxiliary tanks and shall undergo a similar heat build such that the fuel temperature shall be within 3°F (1.6°C) of the primary tank.

49. A new § 86.135-90 is added to Subpart B, to read as follows:

**§ 86.135-90 Dynamometer procedure.**

(a) *Overview*—(1) *Gasoline-fueled and methanol-fueled Otto-cycle vehicles.* The dynamometer run consists of two tests, a "cold" start test after a minimum 12-hour and a maximum 36-hour soak according to the provisions of §§ 86.132 and 86.133, and a "hot" start test following the "cold" start test by 10 minutes. Engine startup (with all accessories turned off), operation over the UDDS and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles (a single dilution air formaldehyde sample covering the total time of the test may be collected in place of three individual samples). Methanol and formaldehyde samples may be omitted for 1990 through 1994 model years when a FID calibrated on methanol is used.

(2) *Petroleum-fueled and methanol-fueled diesel vehicles.* The dynamometer run consists of two tests, a "cold" start test after a minimum 12-

hour and a maximum 36-hour soak according to the provisions of §§ 86.132 and 86.133, and a "hot" start test following the "cold" start by 10 minutes. Engine startup (with all accessories turned off), operation over the UDDS, and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air in the dilution tunnel as shown in Figure B90-5 and Figure B90-6. Six particulate samples are collected on filters for weighing; the first sample plus back-up is collected during the first 505 seconds of the cold start test; the second sample plus back-up is collected during the remainder of the cold start test (including shutdown); the third sample plus back-up is collected during the hot start test. Continuous proportional samples of gaseous emissions are collected for analysis during each test phase. For petroleum-fueled vehicles, the composite samples collected in bags are analyzed for carbon monoxide, carbon dioxide, and oxides of nitrogen. Hydrocarbons from petroleum-fueled vehicles are sampled and analyzed continuously according to the provisions of § 86.110. Parallel samples of the dilution air are similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen. For methanol-fueled vehicles, bag samples are collected and analyzed for hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen. Methanol and formaldehyde samples are taken for both exhaust emissions and dilution air (a single dilution air formaldehyde sample, covering the total test period may be collected). Methanol and formaldehyde samples may be omitted for 1990 through 1994 model years when an FID calibrated on methanol is used. Parallel bag samples of dilution air are analyzed for hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen.

(b) During dynamometer operation, a fixed speed cooling fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 12 inches (30.5 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5300 cfm (2.50 m<sup>3</sup>/s). If, however, the manufacturer can show that during field operation the vehicle

receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used if approved in advance by the Administrator.

(c) The vehicle speed as measured from the dynamometer rolls shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(d) Practice runs over the prescribed driving schedule may be performed at test point, provided an emission sample is not taken, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit sampling system adjustment.

*Note:* When using two-roll dynamometers a truer speed-time trace may be obtained by minimizing the rocking of the vehicle in the rolls; the rocking of the vehicle changes the tire rolling radius on each roll. This rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch.

(e) The drive wheel tires may be inflated up to a gauge pressure of 45 psi (310 kPa) in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the 2-hour period immediately preceding the test, it shall be warmed up for 15 minutes by operating at 30 mph (48 kph) using a non-test vehicle or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, it shall be set within 1 hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make this adjustment. Dynamometers using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

(h) The driving distance, as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test. The revolutions shall be measured on the same roll or shaft used for measuring the vehicle's speed.

(i) Four-wheel drive vehicles will be tested in a two-wheel drive mode of operation. Full-time four-wheel drive vehicles will have one set of drive wheels temporarily disengaged by the vehicle manufacturer. Four-wheel drive vehicles which can be manually shifted to a two-wheel mode will be tested in the normal on-highway two-wheel drive mode of operation.

50. A new § 86.136-90 is added to Subpart B, to read as follows:

**§ 86.136-90 Engine starting and restarting.**

(a) *Gasoline-fueled and methanol-fueled Otto-cycle vehicles.* Paragraph (a) of this section applies to gasoline-fueled and methanol-fueled Otto-cycle vehicles.

(1) The engine shall be started according to the manufacturer's recommended starting procedures in the owner's manual. The initial 20-second idle period shall begin when the engine starts.

(2) *Choke operation:* (i) Vehicles equipped with automatic chokes shall be operated according to the manufacturer's operating instructions in the owner's manual, including choke setting and "kick-down" from cold fast idle.

(ii) Vehicles equipped with manual chokes shall be operated according to the manufacturer's operating instructions in the owner's manual.

(3) The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(4) The operator may use the choke, accelerator pedal, *etc.*, where necessary to keep the engine running.

(5) If the manufacturer's operating instructions in the owner's manual do not specify a warm engine starting procedure, the engine (automatic and manual-choke engines) shall be started by depressing the accelerator pedal about half way and cranking the engine until it starts.

(b) *Petroleum-fueled and methanol-fueled diesel vehicles.* The engine shall be started according to the manufacturer's recommended starting procedures in the owner's manual. The initial 20-second idle period shall begin when the engine starts. The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(c) If the vehicle does not start after 10 seconds of cranking, cranking shall cease and the reason for failure to start shall be determined. The gas flow measuring device on the constant volume sampler (usually a revolution counter) or CFV (and the hydrocarbon integrator and particulate sampling system when testing petroleum-fueled diesel vehicles and the particulate sampling system when testing methanol-fueled diesel vehicles, *see* § 86.137 Dynamometer test runs) shall be turned off and the sampler selector valves, including the methanol sampler, placed in the "standby" position during this

diagnostic period. In addition, either the CVS should be turned off, or the exhaust tube disconnected from the tailpipe during the diagnostic period. If failure to start is an operational error, the vehicle shall be rescheduled for testing from a cold start.

(1) If a failure to start occurs during the cold portion of the test and is caused by a vehicle malfunction, corrective action of less than 30 minutes duration may be taken (according to § 86.088-25), and the test continued. All sampling system(s) shall be reactivated at the same time cranking begins. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by vehicle malfunction and the vehicle cannot be started, the test shall be voided, the vehicle removed from the dynamometer, and corrective action may be taken according to § 86.088-25. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

(2) If a failure to start occurs during the hot start portion of the test and is caused by vehicle malfunction, the vehicle must be started within one minute of key on. All sampling system(s) shall be reactivated at the same time cranking begins. When the engine starts, the driving schedule timing sequence shall begin. If the vehicle cannot be started within one minute of key on, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken (according to § 86.088-25), and the vehicle rescheduled for testing. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

(d) If the engine "false starts" the operator shall repeat the recommended starting procedure (such as resetting the choke, *etc.*).

(e) *Stalling:* (1) If the engine stalls during an idle period, the engine shall be restarted immediately and the test continued. If the engine cannot be started soon enough to allow the vehicle to follow the next acceleration as prescribed, the driving schedule indicator shall be stopped. When the vehicle restarts, the driving schedule indicator shall be reactivated.

(2) If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the vehicle shall then be restarted and accelerated to the speed required at that point in the driving schedule and the test continued. During acceleration to this point, shifting shall be performed in accordance with § 86.128.

(3) If the vehicle will not restart within one minute, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

51. A new § 86.137-90 is added to Subpart B, to read as follows:

**§ 86.137-90 Dynamometer test run, gaseous and particulate emissions.**

(a) *General—* (1) *Gasoline-fueled and methanol-fueled Otto-cycle vehicles.*

The vehicle shall be allowed to stand with the engine turned off for a period of not less than 12 hours or more than 36 hours before the cold start exhaust emission test. The cold start exhaust test shall follow the diurnal breathing loss test by not more than one hour. The vehicle shall be stored prior to the emission test in such a manner that precipitation (*e.g.*, rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 km) and simulates a hot start drive of 7.5 miles (12.1 km). The vehicle is allowed to stand on the dynamometer during the 10 minute time period between the cold and hot start tests. The cold start test is divided into two periods. The first period, representing the cold start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of the driving schedule including engine shutdown. The hot start test, similarly, consists of two periods. The first period, representing the hot start "transient" phase, terminates at the same point in driving schedule as the first period of the cold start test. The second period of the hot start test, "stabilized" phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(2) *Petroleum-fueled and methanol-fueled diesel vehicles.* The vehicle shall be allowed to stand with the engine turned off for a period of not less than 12 hours or more than 36 hours before the cold start exhaust emission test. The vehicle shall be stored prior to the emission test in such a manner that precipitation (*e.g.*, rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 km), and simulates a hot start drive of 7.5 miles (12.1 km). The vehicle is allowed to stand on the dynamometer during the 10

minute time period between the cold and hot start tests. The cold start test is divided into two periods. The first period, representing the cold start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of the driving schedule including engine shutdown. The hot start test, similarly, consists of two periods. The first period, representing the start of the "transient" phase, terminates at the same point in the driving schedule as the first period of the cold start test. The second period of the hot start test, "stabilized" phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(b) The following steps shall be taken for each test:

(1) Place drive wheels of vehicle on dynamometer without starting engine.

(2) Open the vehicle engine compartment cover and position the cooling fan.

(3) For all vehicles, with the sample selector valves in the "standby" position, connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(4) For methanol-fueled vehicles, with the sample selector valves in the "standby" position, insert fresh sample collection impingers into the methanol sample collection system, the formaldehyde sample collection system and fresh impingers (or capsules for formaldehyde) into the dilution air sample collection systems for methanol and formaldehyde (may be omitted for 1990 through 1994 model years).

(5) Start the CVS (if not already on), the sample pumps (except the diesel particulate sample pump, if applicable), the temperature recorder, the vehicle cooling fan, and the heated hydrocarbon analysis recorder (diesels only). (The heat exchanger of the constant volume sampler, if used, petroleum-fueled diesel hydrocarbon analyzer continuous sample line and filter, methanol-fueled vehicle hydrocarbon, methanol and formaldehyde sample lines, if applicable, should be preheated to their respective operating temperatures before the test begins.)

(6) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

(i) For gaseous bag samples (except hydrocarbon samples), the minimum flow rate is 0.17 cfm (0.08 l/sec).

(ii) For hydrocarbon samples, the minimum FID (or HFID in the case of diesel- and methanol-fueled Otto-cycle

vehicles) flow rate is 0.066 cfm (0.031 l/sec).

(iii) For methanol samples, the minimum flow rate is 0.14 cfm (0.067 l/sec).

(iv) For formaldehyde samples, the minimum flow rate is 0.036 cfm (0.017 l/s) with capsule collector and 0.14 cfm (0.067 l/s) with impinger.

**Note:** CFV sample flow rate is fixed by the venturi design.

(7) Attach the exhaust tube to the vehicle tailpipe(s).

(8) Carefully install a particulate sample filter into each of the filter holders for diesel vehicle tests. The filters must be handled only with forceps or tongs. Rough or abrasive filter handling will result in erroneous weight determination.

(9) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the "transient" exhaust sample bag, the "transient" methanol exhaust sample, the "transient" formaldehyde exhaust sample, the "transient" dilution air sample bag, the "transient" methanol dilution air sample and the "transient" formaldehyde dilution air sample (turn on the petroleum-fueled diesel hydrocarbon analyzer system integrator, mark the recorder chart, start particulate sample pump No. 1, and record both gas meter or flow measurement instrument readings, if applicable), turn the key on, and start cranking the engine.

(10) Fifteen seconds after the engine starts, place the transmission in gear.

(11) Twenty seconds after the engine starts, begin the initial vehicle acceleration of the driving schedule.

(12) Operate the vehicle according to the Urban Dynamometer Driving Schedule (§ 86.115).

**Note:** During diesel vehicle testing, adjust the flow rate through the particulate sample probe to maintain a constant value within  $\pm 5$  percent of the set flow rate. Record the average temperature and pressure at the gas meter or flow instrument inlet. If the set flow rate cannot be maintained because of high particulate loading on the filter, the test shall be terminated. The test shall be rerun using a lower flow rate, or larger diameter filter, or both.

(13) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously switch the sample flows from the "transient" bags and samples to the "stabilized" bags and samples, switch off gas flow measuring device No. 1, switch off the No. 1 petroleum-fueled diesel hydrocarbon integrator and the No. 1 particulate sample pump, mark the petroleum-fueled diesel hydrocarbon recorder chart, and close valves

isolating particulate filter No. 1, if applicable, and start gas flow measuring device No. 2, and start the petroleum-fueled diesel hydrocarbon integrator No. 2 and the No. 2 particulate sample pump and open valves isolating particulate filter No. 2, if applicable. Before the acceleration which is scheduled to occur at 510 seconds, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible transfer the "transient" exhaust and dilution air samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test.

(14) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(15) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 and if applicable, turn off the petroleum-fueled diesel hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart, turn off the No. 2 particulate sample pump and close the valves isolating particulate filter No. 2, and position the sample selector valves to the "standby" position (and open the valves isolating particulate filter No. 1, if applicable). Record the measured roll or shaft revolutions (both gas meter or flow measurement instrumentation readings), and re-set the counter. As soon as possible, transfer the "stabilized" exhaust and dilution air samples to the analytical system and process the samples according to § 86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period. If applicable, carefully remove both pairs of particulate sample filters from their respective holders, and place each in a separate petri dish, and cover.

(16) Immediately after the end of the sample period, turn off the cooling fan and close the engine compartment cover.

(17) Turn off the CVS or disconnect the exhaust tube from the tailpipe(s) of the vehicle.

(18) Repeat the steps in paragraphs (b)(2) through (b)(2) of this section for the hot start test, except only two evacuated sample bags, two methanol

sample impingers, two formaldehyde sample impingers, and one pair of particulate sample filters, as appropriate, are required. The step in paragraph (b)(9) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold start test.

(19) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously turn off gas flow measuring device No. 1 (and the petroleum-fueled diesel hydrocarbon integrator No. 1, mark the petroleum-fueled diesel hydrocarbon recorder chart and turn off the No. 1 particulate sample pump, if applicable) and position the sample selector valve to the "standby" position. (Engine shutdown is not part of the hot start test sample period.) Record the measured roll or shaft revolutions (and the No. 1 gas meter reading or flow measurement instrument). (Carefully remove the third pair of particulate sample filters from its holder and place in a clean petri dish and cover, if applicable.)

(20) As soon as possible, transfer the hot start "transient" exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period (if it is not possible to perform analysis on the methanol and formaldehyde samples, within 24 hours, the samples should be stored in a dark cold ( $\sim 0^\circ\text{C}$ ) environment until analysis).

(21) As soon as possible, and in no case longer than one hour after the end of the hot start phase of the test, transfer the six particulate filters to the weighing chamber for post-test conditioning, if applicable.

(22) Disconnect the exhaust tube from the vehicle tailpipe(s) and drive the vehicle from dynamometer.

(23) The CVS or CFV may be turned off, if desired.

(24) Vehicles to be tested for evaporative emissions will proceed according to § 86.136. For all others this completes the test sequence.

52. A new § 86.138-90 is added to Subpart B, to read as follows:

**§ 86.138-90 Hot-soak test.**

The hot-soak evaporative emission test shall be conducted immediately following the hot transient exhaust emission test.

(a) Prior to the completion of the hot-start transient exhaust emission

sampling period, the evaporative emission enclosure shall be purged for several minutes.

(b) The FID (or HFID) hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(c) Fresh impingers shall be installed in the methanol sample collection system immediately prior to the start of the test, if applicable.

(d) If not already on, the evaporative enclosure mixing fan shall be turned on at this time.

(e) Upon completion of the hot transient exhaust emission sampling period, the vehicle engine compartment cover shall be closed, the cooling fan shall be moved, the vehicle shall be disconnected from the dynamometer and exhaust sampling system, and then driven at minimum throttle to the vehicle entrance of the enclosure.

(f) The vehicle's engine must be stopped before any part of the vehicle enters the enclosure. The vehicle may be pushed or coasted into the enclosure.

(g) The test vehicle windows and luggage compartments shall be opened, if not already open.

(h) The temperature recording system shall be started and the time of engine shut off shall be noted on the evaporative emission hydrocarbon recording system.

(i) The enclosure doors shall be closed and sealed within two minutes of engine shutdown and within seven minutes after the end of the exhaust test.

(j) The  $60 \pm 0.5$  minute hot soak begins when the enclosure doors are sealed. The enclosure atmosphere shall be analyzed for hydrocarbon and recorded. This is initial (time=0 minutes) hydrocarbon concentration,  $C_{\text{HC}}$ , for use in calculating evaporative losses, see § 86.143. The "zero" time methanol sample shall be collected starting at the same time as the hydrocarbon analysis is started. Sampling should continue for four minutes.

(k) The test vehicle shall be permitted to soak for a period of one hour in the enclosure.

(1) The FID (or HFID) hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(m) Fresh impingers shall be installed in the methanol collection system immediately prior to the end of the test, if applicable.

(n) At the end of the  $60 \pm 0.5$  minute test period, again analyze the enclosure atmosphere for hydrocarbons and methanol, as described in § 86.138-90(j), and record time. These analyses provide the final (time=60 minutes) hydrocarbon concentration,  $C_{\text{HC}}$ , and the final methanol level for use in calculating evaporative losses, see

§ 86.143. This operation completes the evaporative emission measurement procedure.

(o) *Alternate method for methanol sampling.* Since sample times of longer than four minutes may be necessary in order to collect an adequate and representative sample of methanol at the end of a test (when SHED concentrations are usually increasing rapidly), it may be necessary to rapidly collect the methanol sample in a bag and then bubble the bag sample through the impingers at the specified flow rate. The time elapsed between collection of the bag sample and flowing through the impingers should be minimized in order to prevent any losses. This alternative must be adopted if the four minute sample period is inadequate to collect a sample of sufficient concentration to allow accurate GC analysis.

53. A new § 86.139-90 is added to Subpart B, to read as follows:

**§ 86.139-90 Particulate filter handling and weighing.**

(a) At least 8 hours, but not more than 56 hours before the test, place each filter in an open, but protected, petri dish and place in the weighing chamber which meets the humidity and temperature specifications of § 86.112.

(b) At the end of the 8 to 56 hour stabilization period, weigh the filter on a balance having a precision of one microgram. Record this weight. This reading is the tare weight.

(c) The filter shall then be stored in a covered petri dish which shall remain in the weighing chamber until needed for testing.

(d)(1) If the filter is not used within one hour of its removal from the weighing chamber, it shall be reweighed.

(2) The one hour limit may be replaced by an eight-hour limit if one or both of the following conditions are met:

(i) A stabilized filter is placed and kept in a sealed filter holder assembly with the ends plugged, or

(ii) A stabilized filter is placed in a sealed filter holder assembly, which is then immediately placed in a sample line through which there is no flow.

(e) After the test, and after the sample filter is returned to the weighing room, condition it for at least 1 hour but not more than 56 hours. Then weigh a second time. This latter reading is the gross weight of the filter. Record this weight.

(f) The net weight ( $P_e$ ) is the gross weight minus the tare weight.

**Note:** Should the sample on the filter contact the petri dish or any other surface, the test is void and must be rerun.

54. A new § 86.140-90 is added to Subpart B, to read as follows:

**§ 86.140-90 Exhaust sample analysis.**

The following sequence of operations shall be performed in conjunction with each series of measurements:

(a) For CO, CO<sub>2</sub>, NO<sub>x</sub>, and for Otto-cycle and methanol-fueled diesel vehicle HC:

(1) Zero the analyzers and obtain a stable zero reading. Recheck after tests.

(2) Introduce span gases and set instrument gains. In order to avoid errors, span and calibrate at the same flow rates used to analyze the test sample. Span gases should have concentrations equal to 75 to 100 percent of full scale. If gain has shifted significantly on the analyzers, check the calibrations. Show actual concentrations on chart.

(3) Check zeroes; repeat the procedure in paragraphs (1) and (2) of this section if required.

(4) Check flow rates and pressures.

(5) Measure HC, CO, CO<sub>2</sub>, and NO<sub>x</sub> concentrations of samples.

(6) Check zero and span points. If difference is greater than 2 percent of full scale, repeat the procedure in paragraphs (a) (1) through (5) of this section.

(b) For petroleum-fueled diesel vehicle HC:

(1) Zero HFID analyzer and obtain a stable zero reading.

(2) Introduce span gas and set instrument gains. Span gas should have concentration equal to 75 to 100 percent of full scale.

(3) Check zero as in (b)(1) of this section.

(4) Introduction of zero and span gas into the analyzer can be accomplished by either of the following methods:

(i) Close heated valve in HC sample (see Figures B90-5 or B90-6), and allow gases to enter HFID. Extreme care should be taken not to introduce gases under high pressure.

(ii) Connect zero and span line directly to HC sample probe and introduce gases at a flow rate greater than 125 percent of the HFID flow rate with the CVS blower operating (see Figures B90-5 or B90-6). Excess flow must be allowed to exit probe inlet.

**Note:** In order to minimize errors, HFID flow rate and pressure during zero and span (and background bag reading) must be exactly the same as that used during testing.

(5) Continuously record (integrate electronically if desired) dilute hydrocarbon emissions levels during test. Background samples are collected in sample bags and analyzed as in paragraphs (b)(4) (i) or (ii) of this section.

(6) Check zero and span as in paragraphs (b)(1) through (b)(4) (i) or (ii) of this section. If difference is greater than 2 percent of full scale, void test and check for HC "hangup" or electronic drift in analyzer.

(c) For CH<sub>3</sub>OH (methanol-fueled vehicles):

(1) Introduce a reference sample of methanol (the concentration of methanol in deionized water is known and is C<sub>MR</sub> in the calculations) into the gas chromatograph and measure the area of the response peak. This reference sample peak area is A<sub>MR</sub> in the calculations.

(2) Introduce test samples into the gas chromatograph and measure the area of the response peak. This peak area is A<sub>MS</sub> in the calculations.

(d) For HCHO (methanol-fueled vehicles): (1) Introduce a reference sample of formaldehyde (the concentration of formaldehyde as a dinitrophenylhydrazine derivative in acetonitrile is known (C<sub>FR</sub>)) into the high pressure liquid chromatograph (HPLC) and measure the area of the response peak. This reference sample peak area is A<sub>FR</sub> in the calculations.

(2) Introduce test samples into the high pressure liquid chromatograph and measure the area of the responses peak. This peak area is A<sub>FS</sub> in the calculations.

55. A new § 86.142-90 is added to Subpart B, to read as follows:

**§ 86.142-90 Records required.**

The following information shall be recorded with respect to each test:

(a) Test number.

(b) System or device tested (brief description).

(c) Date and time of day for each part of the test schedule.

(d) Instrument operated.

(e) Driver or operator.

(f) Vehicle: ID number, manufacturer, model year, standards, engine family, evaporative emissions family, basic engine description (including displacement, number of cylinders, turbocharger used, and catalyst usage), fuel system (including number of carburetors, number of carburetor barrels, fuel injection type and fuel tank(s) capacity and location), engine code, gross vehicle weight rating, inertia weight class, actual curb weight at zero miles, actual road load at 50 mph (80 kph), transmission configuration, axle ratio, car line, system miles, idle rpm, and drive wheel tire pressure, as applicable.

(g) Indicated road load power absorption at 50 mph (80 kph) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be

used, with the advance approval of the Administrator, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning—gain—serial number—detector number—range. As an alternative a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span, exhaust gas, and dilution air sample traces.

(j) Test cell barometric pressure, ambient temperature, and humidity.

**Note:** A central laboratory barometer may be used: *Provided*, that individual test cell barometric pressures are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures, as prescribed.

(l) Pressure of the mixture of exhaust and dilution air entering the CVS metering device (or pressure drop across the CFV), the pressure increase across the device, and the temperature at the inlet. The temperature may be recorded continuously or digitally to determine temperature variations.

(m) The number of revolutions of the positive displacement pump accumulated during each test phase while exhaust samples are being collected. The number of standard cubic feet metered by a critical flow venturi during each test phase would be the equivalent record for a CFV.

(n) The humidity of the dilution air.

**Note:** If conditioning columns are not used (see §§ 86.122 and 86.144) this measurement can be deleted. If the conditioning columns are used and the dilution air is taken from the test cell, the ambient humidity can be used for this measurement.

(o) The temperature of the gas flowing in the heated sample line before the heated filter, and also before the HFID, and the temperature of the control system of the heated hydrocarbon detector (for petroleum-fueled diesel vehicles only).

(p) The driving distance for each of the three phases of the test, calculated from the measured roll or shaft revolutions.

(q) *Additional required records for petroleum-fueled and methanol-fueled diesel vehicles.* (1) Pressure and temperature of the dilute exhaust mixture (and background air if sampled) at the inlet to the gas meter used for particulate sampling.

(2) The temperature of the dilute exhaust mixture inside the dilution

tunnel near the inlet of the particulate probe.

(3) Gas meter or flow measurement instrumentation readings at the start of each sample period and at the end of each sample period.

(4) The stabilized pre-test weight and post-test weight of each particulate sample and back-up filter.

(5) Continuous temperature and humidity recording of the ambient air in which the particulate filters were stabilized.

(r) *Additional required records for methanol-fueled vehicles.* (1) Specification of the methanol-fuel used during the test.

(2) Volume of sample passed through the methanol sampling system and the volume of deionized water in each impinger.

(3) The methanol concentration in the reference sample and the peak area from the GC analysis of the reference sample.

(4) The peak area of the GC analyses of the test samples (methanol).

(5) Volume of sample passed through the formaldehyde sampling system.

(6) The formaldehyde concentration in the reference sample and the peak area from the HPLC analysis of the reference sample.

(7) The peak area of the HPLC analysis of the test sample (formaldehyde).

(8) The temperature of the sample lines before the HFID and the impingers, and the temperature of the control system of the heated hydrocarbon detector.

56. A new § 86.143-90 is added to Subpart B, to read as follows:

**§ 86.143-90 Calculations; evaporative emissions.**

(a) The calculation of the net hydrocarbon, methanol and hydrocarbon plus methanol (organic material hydrocarbon equivalent) mass change in the enclosure is used to determine the diurnal and hot soak mass emissions. The mass changes are calculated from initial and final hydrocarbon and methanol concentrations in ppm carbon, initial and final enclosure ambient temperatures, initial and final barometric pressures, and net enclosure volume using the following equations:

(1) For methanol:

$$M_{\text{CH}_3\text{OH}} = \left( \frac{V_n \times C_{\text{MR}}}{A_{\text{MR}}} \right) \times \left( \frac{T_{\text{Ef}}}{(V_{\text{Ef}} \times T_{\text{SHEDf}})} \times [(A_{\text{MS1f}} \times AV_{1f}) + (A_{\text{MS2f}} \times AV_{2f})] - \frac{T_{\text{Ei}}}{(V_{\text{Ei}} \times T_{\text{SHEDI}})} \times [(A_{\text{MS1i}} \times AV_{1i}) + (A_{\text{MS2i}} \times AV_{2i})] \right)$$

Where:

(i)  $M_{\text{CH}_3\text{OH}}$  = Methanol mass change,  $\mu\text{g}$ .

(ii)  $V_n$  = Net enclosure volume,  $\text{ft}^3$ , as determined by subtracting  $50 \text{ ft}^3$  ( $1.42 \text{ m}^3$ ) (volume of vehicle with trunk and windows open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal  $50 \text{ ft}^3$ ) with advance approval by the Administrator:

*Provided*, the measured volume is

determined and used for all vehicles tested by that manufacturer.

(iii)  $C_{\text{MR}}$  = Concentration of methanol in standard sample for calibration of GC,  $\mu\text{g}/\text{ml}$ .

(iv)  $A_{\text{MR}}$  = GC peak area of standard sample.

(v)  $T_E$  = Temperature of sample withdrawn,  $^{\circ}\text{R}$ .

(vi)  $V_E$  = Volume of sample withdrawn,  $\text{ft}^3$ .

(vii)  $T_{\text{SHED}}$  = Temperature of SHED,  $^{\circ}\text{R}$ .

(viii)  $A_{\text{MS}}$  = GC peak area of sample.

(ix)  $AV$  = Volume of absorbing reagent in impinger.

(x)  $P_B$  = Barometric pressure at time of sampling, in. Hg.

(xi)  $i$  = Initial sample.

(xii)  $f$  = Final sample.

(xiii) 1 = First impinger.

(xiv) 2 = Second impinger.

(2) For hydrocarbons:

$$M_{\text{HC}} = (kV_n \times 10^{-9}) \left[ \frac{(C_{\text{HCf}} - rC_{\text{CH}_3\text{OHf}})P_{\text{Bf}}}{T_f} - \frac{(C_{\text{HCi}} - rC_{\text{CH}_3\text{OHi}})P_{\text{Bi}}}{T_i} \right]$$

Where:

(i)  $M_{\text{HC}}$  = Hydrocarbon mass change, g.

(ii)  $C_{\text{HC}}$  = FID hydrocarbon concentration as ppm carbon including FID response to methanol in the sample.

(iii)  $C_{\text{CH}_3\text{OH}}$  = Methanol concentration as ppm carbon.

$$= \left( \frac{1.501 \times 10^{-3} C_{MR} \times T}{A_{MR} \times P_B \times V_E} \right) \times [(A_{S1} \times AV_1) + (A_{S2} \times AV_2)]$$

(iv)  $V_n$  = Net enclosure volume ft<sup>3</sup> (m<sup>3</sup>), as determined by subtracting 50 ft<sup>3</sup> (1.42 m<sup>3</sup>) (volume of vehicle with trunk and windows open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal 50 ft<sup>3</sup>) with advance approval by the Administrator: *Provided*, the measured volume is determined and used for all vehicles tested by that manufacturer.

(v)  $r$  = FID response factor to methanol.

(vi)  $P_B$  = Barometric pressure, in Hg (kPa).

(vii)  $T$  = Enclosure temperature, °R (°K).

(viii)  $i$  = initial reading.

(ix)  $f$  = final reading.

(x) 1 = First impinger.

(xi) 2 = Second impinger.

(xii)(A)  $k = 0.208 (12 + H/C)$ .

(B) For SI units,  $k = 1.2 (12 + H/C)$ .

Where:

(xiii)  $H/C$  = hydrogen-carbon ratio.

(A)  $H/C = 2.33$  for diurnal emissions.

(B)  $H/C = 2.2$  for hot soak emissions.

(3) For total evaporative emissions:

Total Evaporative Emissions = Total Diurnal Emissions + Total Hot Soak Emissions

$$= (M_{HC} + \frac{14.3594}{32.042} \times 10^6 M_{CH_3OH}) + (M_{HC} + \frac{14.2284}{32.042} \times 10^6 M_{CH_3OH}), g$$

(b) The final reported results shall be computed by summing the individual evaporative emission results determined for the diurnal breathing-loss test, running-loss test and the hot-soak test.

57. A new § 86.144-90 is added to Subpart B, to read as follows:

**§ 86.144-90 Calculations; exhaust emissions.**

The final reported test results shall be computed by use of the following formula:

(a) For light-duty vehicles and light duty trucks:

$$Y_{wm} = 0.43 \left( \frac{Y_{ct} + Y_s}{D_{ct} + D_s} \right) + 0.57 \left( \frac{Y_{ht} + Y_s}{D_{ht} + D_s} \right)$$

Where:

(1)  $Y_{wm}$  = Weighted mass emissions of each

pollutant, *i.e.*, HC, CO, NO<sub>x</sub> or CO<sub>2</sub>, in grams per vehicle mile and if appropriate, the weighted organic material hydrocarbon equivalent mass in grams per vehicle mile.

(2)  $Y_{ct}$  = Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.

(3)  $Y_{ht}$  = Mass emissions as calculated from the "transient" phase of the hot start test, in grams per test phase.

(4)  $Y_s$  = Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

(5)  $D_{ct}$  = The measured driving distance from the "transient" phase of the cold start test, in miles.

(6)  $D_{ht}$  = The measured distance from the "transient" phase of the hot start test, in miles.

(7)  $D_s$  = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

(b) The mass of each pollutant for each phase of both the cold start test

and the hot start test is determined from the following:

(1) Hydrocarbon mass:

$$HC_{mass} = V_{mix} \times \text{Density}_{HC} \times (HC_{conc} / 1,000,000)$$

(2) Oxides of nitrogen mass:

$$NO_{xmass} = V_{mix} \times \text{Density}_{NO_2} \times K_H \times (NO_{xconc} / 1,000,000)$$

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times \text{Density}_{CO} \times (CO_{conc} / 1,000,000)$$

(4) Carbon dioxide mass:

$$CO_2_{mass} = V_{mix} \times \text{Density}_{CO_2} \times (CO_2_{conc} / 100)$$

(5) Methanol mass:

$$CH_3OH_{mass} = V_{mix} \times \text{Density}_{CH_3OH} \times (CH_3OH_{conc} / 1,000,000)$$

(6) Formaldehyde mass:

$$HCHO_{mass} = V_{mix} \times \text{Density}_{HCHO} \times (HCHO_{conc} / 1,000,000)$$

(7) Organic material hydrocarbon equivalent mass:

(i) OMHCE =

$$HC_{mass} + \frac{13.8756}{32.042} (CH_3OH_{mass}) + \frac{13.8756}{30.0262} (HCHO_{mass})$$

(c) Meaning of symbols:

(1)(i)  $HC_{mass}$  = Hydrocarbon emissions, in grams per test phase.

(ii)  $\text{Density}_{HC}$  = Density of hydrocarbons is 16.33 g/ft<sup>3</sup> (0.5768 kg/m<sup>3</sup>), assuming an average carbon to

hydrogen ratio of 1:1.85, at 68°F (20°C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $HC_{conc}$  = Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent, *i.e.*, equivalent propane × 3.

(B)  $HC_{conc} = HC_e - HC_d(1 - 1/DF)$ .

Where:

(iv)(A)  $HC_e$  = Hydrocarbon concentration of the dilute exhaust sample or, for diesel (or methanol-fueled vehicles, if selected), average

hydrocarbon concentration of the dilute exhaust sample as calculated from the integrated HC traces, in ppm carbon equivalent.

$$(B) HC_e = FID HC_e - (r)C_{CH_3OH_e}$$

(v) FID  $HC_e$  = Concentration of hydrocarbon plus methanol in dilute exhaust as measured by the FID, ppm carbon equivalent.

(vi)  $r$  = FID response to methanol.

(vii)  $C_{CH_3OH_e}$  = Concentration of methanol in dilute exhaust as determined from the dilute exhaust methanol sample in ppm carbon. For vehicles not fueled with methanol,  $C_{CH_3OH_e}$  equals zero.

(viii)(A)  $HC_d$  = Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.

$$(B) HC_d = FID HC_d - (r)C_{CH_3OH_d}$$

(ix) FID  $HC_d$  = Concentration of hydrocarbon plus methanol in dilution air as measured by the FID, ppm carbon equivalent.

(x)  $C_{CH_3OH_d}$  = Concentration of methanol in dilution air as determined from dilution air methanol sample in ppm carbon. For vehicles not fueled with methanol,  $C_{CH_3OH_d}$  equal zero.

(2)(i)  $NO_{x_{mass}}$  = Oxides of nitrogen emissions, in grams per test phase.

(ii) Density  $NO_2$  = Density of oxides of nitrogen is 54.16 g/ft<sup>3</sup> (1.913 kg/m<sup>3</sup>) assuming they are in the form of nitrogen dioxide, at 68°F (20°C) and 760 mm Hg (101.3kPa) pressure.

(iii)(A)  $NO_{x_{conc}}$  = Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm.

$$(B) NO_{x_{conc}} = NO_{x_e} - NO_{x_d}(1 - (1/DF))$$

Where:

(iv)  $NO_{x_e}$  = Oxides of nitrogen concentration of the dilute exhaust sample as measured, in ppm.

(v)  $NO_{x_d}$  = Oxides of nitrogen concentration of the dilution air as measured, in ppm.

(3)(i)  $CO_{mass}$  = Carbon monoxide emissions, in grams per test phase.

(ii) Density  $CO$  = Density of carbon monoxide is 32.97 g/ft<sup>3</sup> (1.164 kg/m<sup>3</sup>), at 68°F (20°C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $CO_{conc}$  = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO<sub>2</sub> extraction, in ppm.

$$(B) CO_{conc} = CO_e - CO_d(1 - (1/DF))$$

Where:

(iv)(A)  $CO_e$  = Carbon monoxide concentration of the dilute exhaust volume corrected for water vapor and carbon dioxide extraction, in ppm.

$$(B) CO_e = (1 - 0.01925CO_{2e} - 0.000323R)CO_{em}$$

for petroleum fuel with hydrogen to carbon ratio of 1.85:1.

$$(C) CO_e = (1 - (0.01 + 0.005HCR)CO_{2e} - 0.000323R)CO_{em}$$

for methanol fuel, where HCR is hydrogen-to-carbon ratio as measured for the fuel used.

(v)  $CO_{em}$  = Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.

(vi)  $CO_{2e}$  = Carbon dioxide concentration of the dilute exhaust sample, in percent.

(vii)  $R$  = Relative humidity of the dilution air, in percent (see § 86.142(n)).

(viii)(A)  $CO_d$  = Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.

$$(B) CO_d = (1 - 0.000323R)CO_{dm}$$

Where:

(ix)  $CO_{dm}$  = Carbon monoxide concentration of the dilution air sample as measured, in ppm.

Note: If a CO instrument which meets the criteria specified in § 86.111 is used and the conditioning column has been deleted,  $CO_{em}$  must be substituted directly for  $CO_e$  and  $CO_{dm}$  must be substituted directly for  $CO_d$ .

(4)(i)  $CO_{2_{mass}}$  = Carbon dioxide emissions, in grams per test phase.

(ii) Density  $CO_2$  = Density of carbon dioxide is 51.81 g/ft<sup>3</sup> (1.830 kg/m<sup>3</sup>), at 68°F (20°C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $CO_{2_{conc}}$  = Carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.

$$(B) CO_{2_{conc}} = CO_{2e} - CO_{2d}(1 - (1/DF))$$

Where:

(iv)  $CO_{2d}$  = Carbon dioxide concentration of the dilution air as measured, in percent.

(5)(i)  $CH_3OH_{mass}$  = Methanol emissions corrected for background, in grams per test phase.

(ii) Density  $CH_3OH$  = Density of methanol is 37.71 g/ft<sup>3</sup> (1.332 kg/m<sup>3</sup>), at 68°F (20°C) and 760 mmHg (101.3kPa) pressure.

(iii)(A)  $CH_3OH_{conc}$  = Methanol concentration of the dilute exhaust corrected for background, ppm.

$$(B) CH_3OH_{conc} = C_{CH_3OH_e} - C_{CH_3OH_d}(1 - (1/DF))$$

Where:

(iv)(A)  $C_{CH_3OH_e}$  = Methanol concentration in the dilute exhaust, ppm.

$$(B) C_{CH_3OH_e} = \frac{3.813 \times 10^{-2} \times C_{CH_3OHR} \times T_{EM} [(A_{S1} \times AV_{S1}) + (A_{S2} \times AV_{S2})]}{A_{CH_3OHR} \times P_B \times V_{EM}}$$

(v)(A)  $C_{CH_3OH_d}$  = Methanol concentration in the dilution air, ppm.

$$(B) C_{CH_3OH_d} = \frac{3.813 \times 10^{-2} \times C_{CH_3OHR} \times T_{DM} [(A_{D1} \times AV_{D1}) + (A_{D2} \times AV_{D2})]}{A_{CH_3OHR} \times P_B \times V_{DM}}$$

(vi)  $C_{CH_3OHR}$  = Concentration of methanol in standard sample for calibration of GC, µg/ml.

(vii)  $A_{CH_3OHR}$  = GC peak area of standard sample.

(viii)  $T_{EM}$  = Temperature of methanol sample withdrawn from dilute exhaust, °R.



- (ix)  $T_{DM}$  = Temperature of methanol sample withdrawn from dilution air, °R.
- (x)  $P_B$  = Barometric pressure during test, mm Hg.
- (xi)  $V_{EM}$  = Volume of methanol sample withdrawn from dilute exhaust, ft<sup>3</sup>.
- (xii)  $V_{DM}$  = Volume of methanol sample withdrawn from dilution air, ft<sup>3</sup>.
- (xiii)  $A_S$  = GC peak area of sample drawn from dilute exhaust.
- (xiv)  $A_D$  = GC peak area of sample drawn from dilution air.

- (xv)  $AV_S$  = Volume of absorbing reagent (deionized water) in impinger through which methanol sample from dilute exhaust is drawn, ml.
- (xvi)  $AV_D$  = Volume of absorbing reagent (deionized water) in impinger through which methanol sample from dilution air is drawn, ml.
- (xvii) 1 = first impinger.
- (xviii) 2 = second impinger.
- (6)(i)  $HCHO_{mms}$  = Formaldehyde emissions corrected for background, in grams per test phase.

- (ii)  $Density_{HCHO}$  = Density of formaldehyde is 35.36 g/ft<sup>3</sup> (1.249 kg/m<sup>3</sup>), at 68 °F (20 °C) and 760 mmHg (101.3 kPa) pressure.
- (iii)(A)  $HCHO_{conc}$  = Formaldehyde concentration of the dilute exhaust corrected for background, in ppm.
- (B)  $HCHO_{conc} = C_{HCHO_e} - C_{HCHO_d} (1 - (1/DF))$
- Where:
- (iv)(A)  $C_{HCHO_e}$  = Formaldehyde concentration in dilute exhaust, in ppm.

$$(B) C_{HCHO_e} = \frac{4.069 \times 10^{-2} \times C_{FDE} \times V_{AE} \times Q \times T_{EF}}{V_{SE} \times P_B}$$

(v)(A)  $C_{HCHO_d}$  = Formaldehyde concentration in dilution air in ppm.

$$(B) C_{HCHO_d} = \frac{4.069 \times 10^{-2} \times C_{FDA} \times V_{AA} \times Q \times T_{DF}}{V_{BA} \times P_B}$$

- (vi)  $C_{FDE}$  = Concentration of DNPH derivative of formaldehyde from dilute exhaust sample in sampling solution, µg/ml.
- (vii)  $V_{AE}$  = Volume of sampling solution for dilute exhaust formaldehyde sample, ml.
- (viii)(A)  $Q$  = Ratio of molecular weights of formaldehyde to its DNPH derivative.
- (B)  $Q = 0.1429$ .

- (ix)  $T_{EF}$  = Temperature of formaldehyde sample withdrawn from dilute exhaust, °R.
- (x)  $V_{SE}$  = Volume of formaldehyde sample withdrawn from dilute exhaust, ft<sup>3</sup>.
- (xi)  $P_B$  = Barometric pressure during test, mm Hg.
- (xii)  $C_{FDA}$  = Concentration of DNPH derivative of formaldehyde from dilution air sample in sampling solution, µg/ml.

- (xiii)  $V_{AA}$  = Volume of sampling solution for dilution air formaldehyde sample, ml.
- (xiv)  $T_{DF}$  = Temperature of formaldehyde sample withdrawn from dilution air, °R.
- (xv)  $V_{BA}$  = Volume of formaldehyde sample withdrawn from dilution air, ft<sup>3</sup>.
- (7)(i)  $DF = 13.4 / [CO_{2e} + (HC_e + CO_e) 10^{-4}]$  for petroleum-fueled vehicles.

$$(ii) DF = \frac{100 \times \left( \frac{x}{x + y/2 + 3.76(x + y/4 - z/2)} \right)}{CO_{2e} + (HC_e + CO_e + C_{CH_3OH_e}) 10^{-4}}$$

for methanol-fueled vehicles where fuel composition is  $C_xH_yO_z$  as measured for the fuel used.

- (iii)(A)  $K_H$  = Humidity correction factor.
- (B)  $K_H = 1 / [1 - 0.0047(H - 75)]$ .
- (C) For SI units,  $K_H = 1 / [1 - 0.0329(H - 10.71)]$ .

Where:

- (iv)(A)  $H$  = Absolute humidity in grains (grams) of water per pound (kilogram) of dry air.
- (B)  $H = [(43.478)R_a \times P_d] / [P_B - (P_d \times R_a / 100)]$ .

(C) For SI units,  $H = [(6.211)R_a \times P_d] / [P_B - (P_d \times R_a / 100)]$ .

- (v)  $R_a$  = Relative humidity of the ambient air, percent.
- (vi)  $P_d$  = Saturated vapor pressure, mm Hg (kPa) at the ambient dry bulb temperature.
- (vii)  $P_B$  = Barometric pressure, mm Hg (kPa).

(viii)(A)  $V_{mix}$  = Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528 °R (293 °K) and 760 mm Hg (101.3 kPa)).

(B) For PDP-CVS,  $V_{mix}$  is:

$$V_{mix} = \frac{V_o \times N \times (P_B - P_i) \times 528}{760 \times T_P}$$

(C) For SI units,

$$V_{mix} = \frac{V_o \times N \times (P_B - P_i) \times 293}{101.3 \times T_P}$$

Where:

- (ix)  $V_o$  = Volume of gas pumped by the positive displacement pump, in cubic feet (m<sup>3</sup>) per revolution. This volume is

dependent on the pressure differential across the positive displacement pump.

(x) N=Number of revolutions of the positive displacement pump during the test phase while samples are being collected.

(xi) P<sub>B</sub>=Barometric pressure, mm Hg (kPa).

(xii) P<sub>4</sub>=Pressure depression below atmospheric measured at the inlet to the positive displacement pump, in mm Hg (kPa) (during an idle mode).

(xiii) T<sub>p</sub>=Average temperature of dilute exhaust entering positive displacement pump during test, °R(°K).

(d) For petroleum-fueled vehicles, example calculation of mass values of exhaust emissions using positive displacement pump:

(1) For the "transient" phase of the cold start test assume the following:

V<sub>o</sub>=0.29344 ft<sup>3</sup>/rev; N=10,485; R=48.0 pct; R<sub>a</sub>=48.2 percent; P<sub>B</sub>=762 mm Hg; P<sub>d</sub>=22.225 mm Hg; P<sub>4</sub>=70 mm Hg; T<sub>p</sub>=570 °R; HC<sub>e</sub>=105.8 ppm, carbon equivalent; NO<sub>x</sub><sub>e</sub>=11.2 ppm; CO<sub>em</sub>=306.6 ppm; CO<sub>2e</sub>=1.43 percent; HC<sub>d</sub>=12.1 ppm; NO<sub>x</sub><sub>d</sub>=0.8 ppm; CO<sub>dm</sub>=15.3 ppm; CO<sub>2d</sub>=0.032 percent; D<sub>ct</sub>=3.598 miles.

Then:

(i) V<sub>mix</sub>=(0.29344)(10,485)(762-70)(528)/(760)(570)=2595.0 ft<sup>3</sup> per test phase.

$$(ii) H = \frac{(43.478)(48.2)(22.225)}{762 - (22.225)(48.2/100)}$$

=62 grains of water per pound of dry air.

(iii) K<sub>H</sub>=1/[1-0.0047(62-75)]=0.9424

(iv) CO<sub>e</sub>=[1-0.01925(1.43)-0.000323(48)](306.6)=293.4 ppm.

(v) CO<sub>d</sub>=[1-0.000323(48)](15.3)=15.1 ppm.

(vi) DF=13.4/[1.43+10<sup>-4</sup>(105.8+293.4)]=9.116.

(vii) HC<sub>conc</sub>=105.8-12.1(1-1/9.116)=95.03 ppm.

(viii) HC<sub>mass</sub>=(2595)(16.33)(95.03/1,000,000)=4.027 grams per test phase.

(ix) NO<sub>x</sub><sub>conc</sub>=11.2-0.8(1-1/9.116)=10.49 ppm.

(x) NO<sub>x</sub><sub>mass</sub>=(2595)(54.16)(10.49/1,000,000)(0.9424)=1.389 grams per test phase.

(xi) CO<sub>conc</sub>=293.4-15.1(1-1/9.116)=280.0 ppm.

(xii) CO<sub>mass</sub>=(2595)(32.97)(280/1,000,000)=23.96 grams per test phase.

(xiii) CO<sub>2conc</sub>=1.43-0.032(1-1/9.116)=1.402 percent.

(xiv) CO<sub>2mass</sub>=(2595.0)(51.85)(1.402/100)=1886 grams per test phase.

(2) For the stabilized portion of the cold start test assume that similar calculations resulted in the following:

(i) HC<sub>mass</sub>=0.62 grams per test phase.

(ii) NO<sub>x</sub><sub>mass</sub>=1.27 grams per test phase.

(iii) CO<sub>mass</sub>=5.98 grams per test phase.

(iv) CO<sub>2mass</sub>=2346 grams per test phase.

(v) D<sub>e</sub>=3.902 miles.

(3) For the "transient" portion of the hot start test assume that similar calculations resulted in the following:

(i) HC<sub>mass</sub>=0.51 gram per test phase.

(ii) NO<sub>x</sub><sub>mass</sub>=1.38 grams per test phase.

(iii) CO<sub>mass</sub>=5.01 grams per test phase.

(iv) CO<sub>2mass</sub>=1758 grams per test phase.

(v) D<sub>ht</sub>=3.598 miles.

(4) Weighted mass emission results:

(i) HC<sub>wm</sub>=0.43[(4.027+0.62)/(3.598+3.902)]+0.57[(0.51+0.62)/(3.598+3.902)]=0.352 grams per vehicle mile.

(ii) NO<sub>xwm</sub>=0.43[(1.389+1.27)/(3.598+3.902)]+0.57[(1.38+1.27)/(3.598+3.902)]=0.354 grams per vehicle mile.

(iii) CO<sub>wm</sub>=0.43[(23.96+5.98)/(3.598+3.902)]+0.57[(5.01+5.98)/(3.598+3.902)]=2.55 grams per vehicle mile.

(iv) CO<sub>2wm</sub>=0.43[(1886+2346)/(3.598+3.902)]+0.57[(1758+2346)/(3.598+3.902)]=555 grams per vehicle mile.

(e) For methanol-fueled vehicle with measured fuel composition of CH<sub>3.14</sub>O<sub>0.8</sub> example calculation of exhaust emissions using positive displacement pump:

(1) For the "transient" phase of the cold start test assume the following:

V<sub>o</sub>=0.29344 ft<sup>3</sup>/rev; N=10,485; R=48.0 pct; R<sub>a</sub>=48.2 percent; P<sub>B</sub>=762 mm Hg; P<sub>d</sub>=22.225 mm Hg; P<sub>4</sub>=70 mm Hg; T<sub>p</sub>=570 °R; FID HC<sub>e</sub>=81.6 ppm, carbon equivalent; r=0.75; C<sub>CH3OHR</sub>=71 ug/ml; T<sub>EM</sub>=567 °R; A<sub>CH3OHR</sub>=3660; V<sub>EM</sub>1.18 ft<sup>3</sup>; A<sub>S1</sub>=4460; AV<sub>S1</sub>=25.2 ml; A<sub>S2</sub>=360; AV<sub>S2</sub>=24.9 ml; T<sub>DM</sub>=532 °R; V<sub>DM</sub>=1.17 ft<sup>3</sup>; A<sub>D1</sub>=110; AV<sub>D1</sub>=25.0 ml; A<sub>D2</sub>=10; AV<sub>D2</sub>=25.1 ml; C<sub>FDE</sub>=20 ug/ml; V<sub>AE</sub>=5.0 ml; Q=0.1429; T<sub>EF</sub>=569 °R; V<sub>SE</sub>=0.30 ft<sup>3</sup>; C<sub>FDA</sub>=1 ug/ml; V<sub>AA</sub>=5.0 ml; T<sub>DF</sub>=532 °R; V<sub>SA</sub>=0.31 ft<sup>3</sup>; NO<sub>x</sub><sub>e</sub>=11.2 ppm; CO<sub>em</sub>=306.6 ppm; CO<sub>2e</sub>=1.43 pct; FID HC<sub>d</sub>=12.1 ppm; NO<sub>x</sub><sub>d</sub>=0.8 ppm; CO<sub>dm</sub>=15.3 ppm; CO<sub>2d</sub>=0.032 percent; D<sub>ct</sub>=3.598 miles.

Then:

(i) V<sub>mix</sub>=(0.29344)(10,485)(762-70)(528)/(760)(570)=2595.0 ft<sup>3</sup> per test phase.

(ii) H=(43.478)(48.2)(22.225)/[762-(22.225×48.2/100)]=62 grains of water per pound of dry air.

(iii) K<sub>H</sub>=1/[1-0.0047(62-75)]=0.9424.

(iv) CO<sub>e</sub>=[1-(0.01+0.005×3.14×1.43)-0.000323(48)]×306.6=291.9 ppm.

(v) CO<sub>d</sub>=(1-0.000323(48))×15.3=15.1 ppm.

$$(vi) C_{CH3OHR} = \frac{(3.813 \times 10^{-4})(71)(567)[(4460)(25.2) + (360)(24.9)]}{(3660)(762)(1.18)} = 56.61 \text{ ppm.}$$

$$(vii) DF = \frac{100(1/[1 + (3.14/2) + 3.76(1 + (3.14/4) - (0.6/2)])])}{1.43 + 10^{-4}[(81.6 + 291.9 + (1 - 0.75)(56.60)]} = 8.350$$

$$(viii) C_{CH3OHR} = \frac{(3.813 \times 10^{-4})(71)(532)[(110)(25.0) + (10)(25.1)]}{(3660)(762)(1.17)} = 1.32 \text{ ppm.}$$

(ix)  $CH_3OH_{conc} = 56.60 - 1.32(1 - 1/8.350) = 55.44$  ppm.

(x)  $CH_3OH_{mass} = 2595.0 \times 37.71 \times (55.44/1,000,000) = 5.43$  grams per test phase.

(xi)  $HC_{conc} = [81.6 - (0.75)(56.60)] - [12.1 - (0.75)(1.32)](1 - 1/8.530) = 29.34$  ppm.

(xii)  $HC_{mass} = (2594)(16.33)(29.34/1,000,000) = 1.24$  grams per test phase.

(xiii)  $C_{HCHO} = \frac{4.069 \times 10^{-7}(20)(5)(0.1429)(569)}{(0.30)(762)} = 1.4473$  ppm.

(xiv)  $C_{HCHO} = \frac{4.069 \times 10^{-7}(1)(5)(0.1429)(532)}{(0.31)(762)} = 0.0655$  ppm.

(xv)  $HCHO_{conc} = 1.4473 - 0.0655(1 - 1/8.350) = 1.3896$  ppm.

(xvi)  $HCHO_{mass} = (2595)(35.36)(1.3896/1,000,000) = 0.1275$  grams per test phase.

(xvii)  $OMHCE = 1.24 + (13.8756/32.042)(5.43) + (13.8756/30.0262)(0.1275) = 3.65$  grams per test phase.

(xviii)  $NO_{x,conc} = 11.2 - (0.8)(1 - 1/8.350) = 10.50$  ppm.

(xix)  $NO_{x,mass} = (2595)(54.16)(10.50/1,000,000)(0.9424) = 1.390$  grams per test phase.

(xx)  $CO_{conc} = 291.9 - 15.1(1 - 1/8.350) = 278.61$  ppm.

(xxi)  $CO_{mass} = (2595.0)(32.97)(278.69/1,000,000) = 23.84$  grams per test phase.

(xxii)  $CO_{2,conc} = 1.43 - 0.032(1 - 1/8.350) = 1.402$  percent.

(xxiii)  $CO_{2,mass} = (2595.0)(51.85)(1.402/100) = 1886$  grams per test phase.

(2) For the stabilized portion of the cold start test assume that similar calculations resulted in the following:

(i)  $OMHCE = 0.55$  grams per test phase.

(ii)  $NO_{x,mass} = 1.27$  grams per test phase.

(iii)  $CO_{mass} = 5.98$  grams per test phase.

(iv)  $CO_{2,mass} = 2346$  grams per test phase.

(v)  $D_c = 3.932$  miles.

(3) For the "transient" portion of the hot start test assume that similar calculations resulted in the following:

(i)  $OMHCE = 0.67$  grams as carbon equivalent per test phase.

(ii)  $NO_{x,mass} = 1.38$  grams per test phase.

(iii)  $CO_{trans} = 5.01$  grams per test phase.

(iv)  $CO_{2,mass} = 1758$  grams per test phase.

(v)  $D_{ht} = 3.598$  miles.

(4) Weighted emission results:

(i)  $OMHCE_{wm} = 0.43[(3.65 + 0.55)/(3.598 + 3.902)] + 0.57[(0.67 + 0.55)/(3.598 + 3.902)] = 0.334$  grams as carbon equivalent per mile.

(ii)  $NO_{x,wm} = 0.43[(1.390 + 1.27)/(3.598 + 3.902)] + 0.57[1.38 + 1.27]/$

$(3.598 + 3.902)] = 0.354$  grams per vehicle mile.

(iii)  $CO_{wm} = 0.43[(23.84 + 5.98)/(3.598 + 3.902)] + 0.57[(5.01 + 5.98)/(3.598 + 3.902)] = 2.54$  grams per vehicle mile.

(iv)  $CO_{2,wm} = 0.43[(1886 + 2346)/(3.598 + 3.902)] + 0.57[(1758 + 2346)/(3.598 + 3.902)] = 555$  grams per vehicle mile.

58. A new § 86.401-90 is added to Subpart E, to read as follows:

**§ 86.401-90 General applicability.**

(a) This subpart applies to 1978 and later model year, new, gasoline-fueled motorcycles built after December 31, 1977, and to 1990 and later model year, new, methanol-fueled motorcycles built after December 31, 1989.

(b) Motorcycles with engine displacements less than 50 cc (3.1 cu in) are excluded from the requirements of this subpart.

(c) Motorcycles are excluded from the requirements of this subpart, if with an 80 kg (176 lb) driver, it cannot:

(1) Start from a dead stop using only the engine, or

(2) Exceed a maximum speed of 40 km/h (25 mph) on level paved surfaces.

59. A new § 86.410-90 is added to Subpart E, to read as follows:

**§ 86.410-90 Emission standards for 1990 and later model year motorcycles.**

(a)(1) Exhaust emissions from 1990 and later model year gasoline-fueled motorcycles shall not exceed:

(i) *Hydrocarbons*. 5.0 grams per vehicle kilometer.

(ii) *Carbon monoxide*. 12 grams per vehicle kilometer.

(2) Exhaust emissions from 1990 and later model year methanol-fueled motorcycles shall not exceed:

(i) *Organic material hydrocarbon equivalent*. 5.0 grams per vehicle kilometer.

(ii) *Carbon monoxide*. 12 grams per vehicle kilometer.

(3) The standards set forth in paragraphs (a) (1) and (2) of this section refer to the exhaust emitted over driving schedule as set forth in Subpart F and measured and calculated in accordance with those procedures.

(b) No crankcase emissions shall be discharged into the ambient atmosphere from any new motorcycle subject to this subpart.

60. A new § 86.509-90 is added to Subpart F, to read as follows:

**§ 86.509-90 Exhaust gas sampling system.**

(a)(1) *General*. The exhaust gas sampling system is designed to measure the true mass emissions of vehicle exhaust. In the CVS concept of measuring mass emissions, two conditions must be satisfied: the total volume of the mixture of exhaust and dilution air must be measured and a continuously proportioned volume of sample must be collected for analysis. Mass emissions are determined from the sample concentration and totalized flow over the test period.

(2) *Vehicle tailpipe to CVS duct*. For methanol fueled vehicles, cooling of the exhaust gases in the duct connecting the vehicle tailpipe to the CVS shall be minimized. This may be accomplished by:

(i) Using a duct of unrestricted length maintained at  $113 \pm 8$  °C ( $235 \pm 15$  °F), heating and possibly cooling capabilities are required; or

(ii) Using a short max. length) duct (up to 12 feet long) constructed of smooth wall pipe with a minimum of flexible sections, maintained at  $112 \pm 8$  °C ( $235 \pm 15$  °F) prior to the test and during any breaks in the test and uninsulated during the test (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded); or

(iii) Using a smooth wall duct less than five feet long with no required heating; or

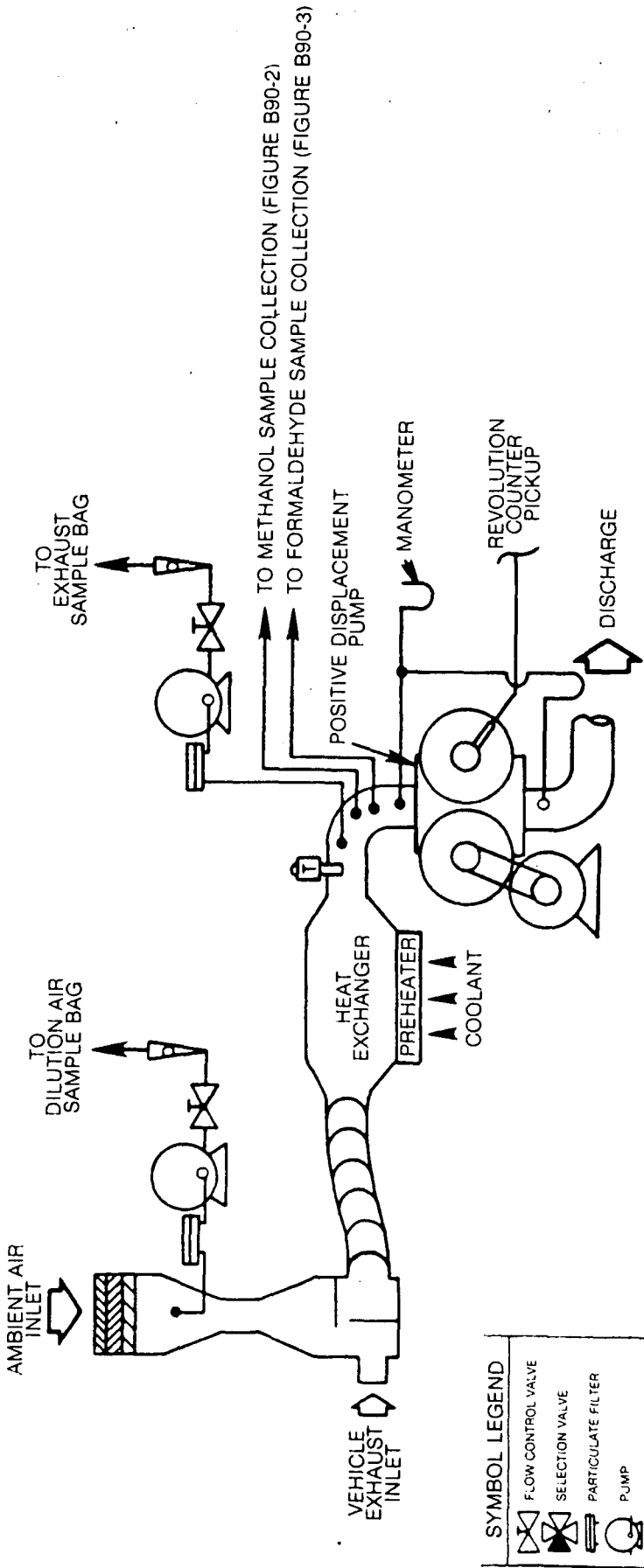
(iv) Omitting the duct and performing the exhaust gas dilution function at the motorcycle tailpipe exit.

(3) *Positive Displacement Pump.* The Positive Displacement Pump-Constant Volume Sampler (PDP-CVS), Figure F90-1, satisfies the first condition by metering at a constant temperature and

pressure through the pump. The total volume is measured by counting the revolutions made by the calibrated positive displacement pump. The proportional samples are achieved by sampling at a constant flow rate. For methanol-fueled motorcycles only, the sample lines for the methanol and

formaldehyde samples are heated to  $113 \pm 8$  °C ( $235 \pm 15$  °F) Note: For 1990 through 1994 model year methanol-fueled motorcycles, methanol and formaldehyde sampling may be omitted provided the bag sample is analyzed using a HFID calibrated with methanol.

BILLING CODE 6560-50-M



**SYMBOL LEGEND**

	FLOW CONTROL VALVE
	SELECTION VALVE
	PARTICULATE FILTER
	PUMP
	FLOWMETER
	PRESSURE GAUGE
	RECORDER
	TEMPERATURE SENSOR

FIGURE F90-1 EXHAUST GAS SAMPLING SYSTEM (PDP-CVS)

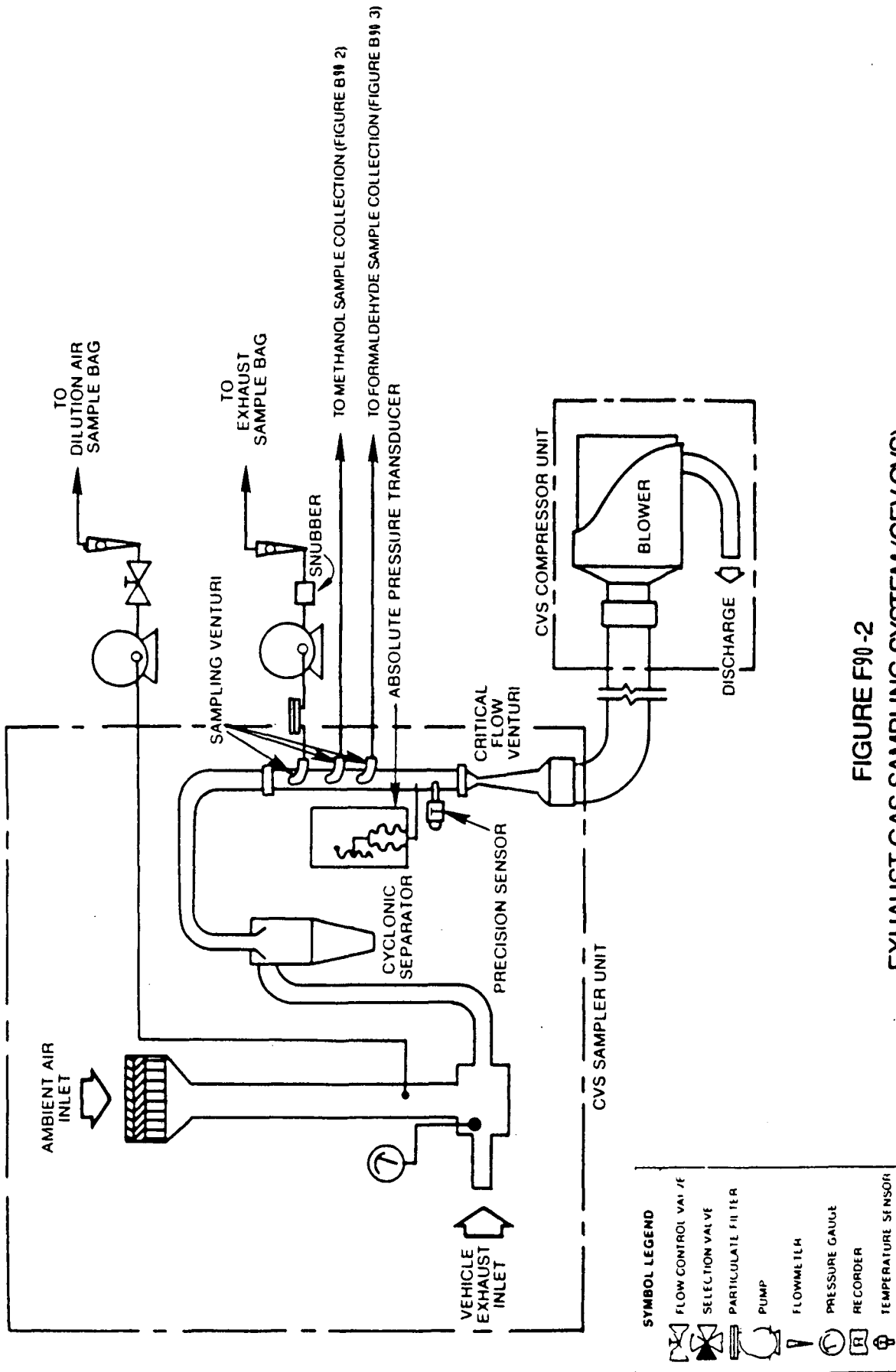
BILLING CODE 6560-50-C

(4) *Critical Flow Venturi*. The operation of the Critical Flow Venturi-Constant Volume Sampler (CFV-CVS), Figure F90-2, is based upon the principles of fluid dynamics associated with critical flow. Proportional sampling is maintained by use of small CFVs in the sample lines, which responds to the varying temperatures in the same manner as the main CFV. For methanol-

fueled motorcycles, the sample lines (methanol and formaldehyde) are heated to  $113 \pm 8$  °C ( $235 \pm 15$  °F). Care must be taken to prevent heating of the small CFVs in the sample probe because heating would cause loss of proportionality. Note: For 1990 through 1994 model year methanol-fueled motorcycles, methanol and formaldehyde sampling may be omitted

provided the bag sample is analyzed using a HFID calibrated with methanol. Total flow per test phase is determined by continuously computing and integrating instantaneous flow. A low response time temperature sensor is necessary for accurate flow calculation.

BILLING CODE 6550-50-M



**FIGURE F90-2**  
**EXHAUST GAS SAMPLING SYSTEM (CFV-CVS)**

BILLING CODE 6560-50-C

(5) [Reserved]

(6) *Other systems.* Other sampling systems may be used if shown to yield equivalent results, and if approved in advance by the Administrator (e.g., a heat exchanger with the CFV-CVS or an electronic flow integrator without a heat exchanger, with the PDP-CVS).

(b) *Component description, PDP-CVS.* The PDP-CVS, Figure F90-1, consists of a dilution air filter and mixing assembly, heat exchanger, positive displacement pump, sampling systems including probes and sampling lines which in the case of the methanol-fueled motorcycles, are heated to  $113 \pm 8$  °C ( $235 \pm 15$  °F) (heating of the sample lines may be omitted provided the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of sample due to resulting condensation in the sample lines) and associated valves, pressure and temperature sensors. The PDP-CVS shall conform to the following requirements:

(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within  $\pm 1.25$  kPa ( $\pm 5.02$  in H<sub>2</sub>O) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within  $\pm 0.25$  kPa ( $\pm 1.00$  in. H<sub>2</sub>O) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The gas mixture temperature, measured at a point immediately ahead of the positive displacement pump, shall be within  $\pm 5$ °C (9 °F) of the designed operating temperature at the start of the test. The gas mixture temperature variation from its value at the start of the test shall be limited to  $\pm 5$  °C (9 °F) during the entire test. The temperature measuring system shall have an accuracy and precision of  $\pm 1$  °C (1.8 °F).

(3) The pressure gauges shall have an accuracy and precision of  $\pm 0.4$  kPa ( $\pm 3$  mm Hg).

(4) The location of the dilution air inlet shall be placed so as to use test-cell air for dilution air and the flow capacity of the CVS shall be large enough to eliminate water condensation in the system. Control of water

condensation with methanol-fueled vehicles is critical. Procedures for determining CVS flow rates are detailed in "Calculation of Emissions and Fuel Economy When Using Alternative Fuels," EPA 460/3-83-009.

(5) Sample collection bags for dilution air and exhaust samples (hydrocarbon and carbon monoxide) shall be of sufficient size so as to not impede sample flow. A single dilution air sample covering the total test period may be collected for determination of formaldehyde background (methanol-fueled motorcycles).

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient size so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the PDP.

(c) *Component description, CFV-CVS.* The CFV-CVS, Figure F90-2, consists of a dilution air filter and mixing assembly, cyclone particulate separator, unheated sampling venturies for the bag, and for methanol-fueled motorcycles the methanol and formaldehyde samples, sample lines (heated to  $113 \pm 8$  °C ( $235 \pm 15$  °F) for the methanol and formaldehyde samples from methanol-fueled motorcycles (heating of sample lines may be omitted provided, the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of sample due to cooling and resulting condensation in the sample line), critical flow venturi, and assorted valves, pressure and temperature sensors. The CFV-CVS shall conform to the following requirements:

(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within  $\pm 1.25$  kPa (5.02 in H<sub>2</sub>O) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within  $\pm 0.25$  kPa (1.00 in H<sub>2</sub>O) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The temperature measuring system shall have an accuracy and precision of  $\pm 1$  °C (1.8 °F) and a response time of

0.100 second to 62.5 percent of a temperature change (as measured in hot silicone oil).

(3) The pressure measuring system shall have an accuracy and precision of  $\pm 0.4$  kPa ( $\pm 3$  mm Hg).

(4) The location of the dilution air inlet shall be placed so as to use test-cell air for dilution air and the flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system. Control of water condensation with methanol fueled vehicles is critical. Procedures for determining CVS flow rates are detailed in "Calculation of Emissions And Fuel Economy When Using Alternate Fuels," EPA 460/3-83-009.

(5) Sample collection bags (hydrocarbon monoxide) for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow. A single dilution air sample covering the total test period may be collected for determination of formaldehyde background for methanol-fueled motorcycles.

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient size so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the CVS.

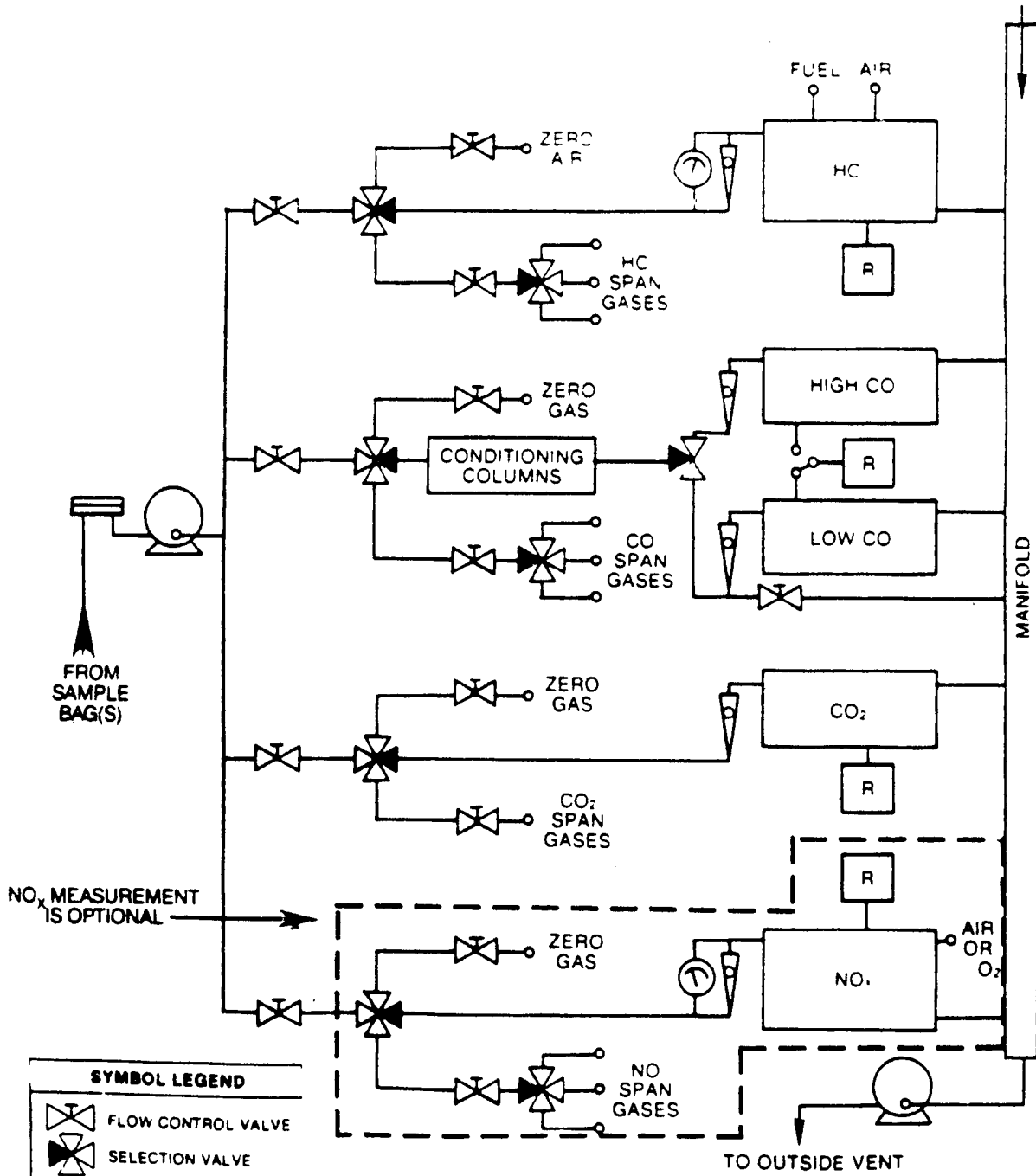
61. A new § 86.511-90 is added to Subpart F, to read as follows:

**§ 86.511-90 Exhaust gas analytical system.**

(a) *Schematic drawings.* Figure F90-3 is a schematic drawing of the exhaust gas analytical system for analysis of hydrocarbons (HC) (hydrocarbons plus methanol in the case of methanol-fueled motorcycles), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>). Since various configurations can produce accurate results, exact conformance with the drawing is not required. Additional components such as instruments, valves, solenoids, pumps and switches may be used to provide additional information and coordinate the functions of the component systems

BILLING CODE 6560-50-M





**SYMBOL LEGEND**

	FLOW CONTROL VALVE
	SELECTION VALVE
	PARTICULATE FILTER
	PUMP
	FLOWMETER
	PRESSURE GAUGE
	RECORDER
	TEMPERATURE SENSOR

FIGURE F90-3 EXHAUST GAS ANALYTICAL SYSTEM

(b) *Major component description.* The exhaust gas analytical system for HC, CO and CO<sub>2</sub>, Figure F90-3, consists of a flame ionization detector (FID) (heated (235°±15 °C (113°±8 °C)) for methanol-fueled vehicles) for the determination of hydrocarbons, nondispersive infrared analyzers (NDIR) for the determination of carbon monoxide and carbon dioxide and, if oxides of nitrogen are measured, a chemiluminescence analyzer (CL) for the determination of oxides of nitrogen. The analytical system for methanol consists of a gas chromatograph (GC) equipped with a flame ionization detector. The analysis for formaldehyde is performed using high pressure liquid chromatography (HPLC) of 2,4-dinitrophenylhydrazine (DNPH) derivatives using ultraviolet (UV) detection. The exhaust gas analytical system shall conform to the following requirements:

(1) The CL requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(2) The carbon monoxide (CO) NDIR analyzer may require a sample conditioning column containing CaSO<sub>4</sub>, or indicating silica gel to remove water vapor and containing ascarite to remove carbon dioxide from the CO analysis stream.

(i) If CO instruments which are essentially free of CO<sub>2</sub> and water vapor interference are used, the use of the conditioning column may be deleted, see §§ 86.522 and 86.544.

(ii) A CO instrument will be considered to be essentially free of CO<sub>2</sub> and water vapor interference if its response to a mixture of 3 percent CO<sub>2</sub> in N<sub>2</sub> which has been bubbled through water at room temperature produces an equivalent CO response, as measured on the most sensitive CO range, which is less than 1 percent of full scale CO concentration on ranges above 300 ppm full scale or less than 3 ppm on ranges below 300 ppm full scale; see § 86.522.

(c) *Other analyzers and equipment.* Other types of analyzers and equipment may be used if shown to yield equivalent results and if approved in advance by the Administrator.

62. Section 86.513-90 of Subpart F is amended by revising paragraphs (c), (d), (e), and adding paragraphs (f), (g), and (h) to read as follows:

**§ 86.513-90 Fuel and engine lubricant specifications.**

\* \* \* \* \*

(c) Methanol fuel used for exhaust and evaporative emission testing and in

service accumulation of methanol-fueled motorcycle vehicles shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(1) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (c).

(2) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(d) Other methanol fuels may be used for testing and service accumulation provided:

(1) They are commercially available, and

(2) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(3) Use of a fuel listed under paragraph (a)(3) of this section would have a detrimental effect on emissions or durability, and

(4) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(e) The specification range of the fuels and engine lubricants to be used under paragraph (b) of this section shall be reported in accordance with § 86.416.

(f) The same lubricant(s) shall be used for both service accumulation and emission testing.

(g) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

(h) *Mixtures of petroleum and methanol fuels for flexible fuel motorcycles.* (1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel motorcycles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (h)(1) of this section shall be reported in accordance with § 86.090 21(b)(3).

63. A new § 86.516-90 is added to Subpart F, to read as follows:

**§ 86.516-90 Calibrations, frequency and overview.**

(a) Calibrations shall be performed as specified in §§ 86.517 through 86.526.

(b) [Reserved]

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer, carbon dioxide analyzer, carbon monoxide analyzer, methanol analyzer, formaldehyde analyzer and, if oxides of nitrogen are measured, oxides of nitrogen analyzer (certain analyzers may require more frequent calibration depending on particular equipment and uses).

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration), the monthly calibration need not be performed.

(d) At least weekly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Check the oxides of nitrogen converter efficiency, if oxides of nitrogen are measured, and

(2) Perform a CVS system verification, and

(3) Run a performance check on the dynamometer. This check may be omitted if the dynamometer has been calibrated within the preceding month.

(e) The CVS positive displacement pump or Critical Flow Venturi shall be calibrated following initial installation, major maintenance or as necessary when indicated by the CVS system verification (described in § 86.519).

(f) Sample conditioning columns, if used in the CO analyzer train, should be checked at a frequency consistent with observed column life or when the indicator of the column packing begins to show deterioration.

64. A new § 86.519-90 is added to Subpart F, to read as follows:

**§ 86.519-90 Constant volume sampler calibration.**

(a) The CVS (Constant Volume Sampler) is calibrated using an accurate flowmeter and restrictor valve. Measurements of various parameters are made and related to flow through the unit. Procedures used by EPA for both PDP (Positive Displacement Pump) and CFV (Critical Flow Venturi) are

outlined below. Other procedures yielding equivalent results may be used if approved in advance by the Administrator. After the calibration curve has been obtained, verification of the entire system can be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true mass injected. An indicated error does not necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system, e.g., analyzer calibration. A verification procedure is found in paragraph (d) of this section.

(b) *PDP calibration.* (1) The following calibration procedures outlines the equipment, the test configuration, and the various parameters which must be measured to establish the flow rate of the constant volume sampler pump. All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump.

The calculated flow rate (at pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value of a specific combination of pump parameters. The linear equation which relates the pump flow and the correlation function is then determined. In the event that a CVS has a multiple speed drive, a calibration for each range must be performed.

(2) This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Three conditions must be maintained to assure the accuracy and integrity of the calibration curve. First, the pump pressures should be measured at taps on the pump rather than at the external piping on the pump inlet and outlet. Pressure taps that are mounted at the top center and bottom center of the pump drive headplate are exposed to the actual pump cavity pressures, and therefore reflect the absolute pressure differentials. Secondly, temperature

stability must be maintained during the calibration. The laminar flowmeter is sensitive to inlet temperature oscillations which cause the data points to be scattered. Gradual changes ( $\pm 1^\circ\text{C}$  ( $\pm 1.8^\circ\text{F}$ )) in temperature are acceptable as long as they occur over a period of several minutes. Finally, all connections between the flowmeter and the CVS pump must be absolutely void of any leakage.

(3) During an exhaust emission test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

(4) Connect a system as shown in Figure F78-5. Although particular types of equipment are shown, other configurations that yield equivalent results may be used if approved in advance by the Administrator. For the system indicated, the following data with given accuracy are required:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure corrected	P <sub>B</sub>	kPa (in. Hg)	$\pm 0.03$ kPa ( $\pm 0.01$ in. Hg)
Ambient temperature	T <sub>A</sub>	$^\circ\text{C}$ ( $^\circ\text{F}$ )	$\pm 0.3^\circ\text{C}$ ( $\pm 0.54^\circ\text{F}$ )
Air Temperature into LFE	ETI	$^\circ\text{C}$ ( $^\circ\text{F}$ )	$\pm 0.15^\circ\text{C}$ ( $\pm 0.27^\circ\text{F}$ )
Pressure depression upstream of LFE	EPI	kPa (in. H <sub>2</sub> O)	$\pm 0.01$ kPa ( $\pm 0.05$ in. H <sub>2</sub> O)
Pressure drop across the LFE matrix	EDP	kPa (in. H <sub>2</sub> O)	$\pm 0.001$ kPa ( $\pm 0.005$ in. H <sub>2</sub> O)
Air temperature at CVS pump inlet	PTI	$^\circ\text{C}$ ( $^\circ\text{F}$ )	$\pm 0.25^\circ\text{C}$ ( $\pm 0.45^\circ\text{F}$ )
Pressure depression at CVS pump inlet	PPI	kPa (in. Fluid)	$\pm 0.021$ kPa ( $\pm 0.046$ in. Fluid)
Specific gravity of manometer fluid (1.75 oil)	Sp Gr		
Pressure head at CVS pump outlet	PPO	kPa (in. Fluid)	$\pm 0.21$ kPa ( $\pm 0.046$ in. Fluid)
Air temperature at CVS pump outlet (optional)	PTO	$^\circ\text{C}$ ( $^\circ\text{F}$ )	$\pm 0.25^\circ\text{C}$ ( $\pm 0.45^\circ\text{F}$ )
Pump revolutions during test period	N	Revs	$\pm 1$ Rev.
Elapsed time for test period	t	sec	$\pm 0.05$ sec.

(5) After the system has been connected as shown in Figure F78-6, set the variable restrictor in the wide open position and run the CVS pump for twenty minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression (about 1.0 kPa (4 in. H<sub>2</sub>O)) that will yield a minimum of six data points for the total calibration. Allow the system to stabilize for 3 minutes and repeat the data acquisition.

(7) Data analysis:

(i) The air flow rate, Q<sub>a</sub>, at each test point is calculated from the flowmeter

data using the manufacturers' prescribed method.

(ii) The air flow rate is then converted to pump flow, V<sub>o</sub> in m<sup>3</sup> per revolution at absolute pump inlet temperature and pressure.

$$V_o = (Q_a/n) \times (T_p/293) \times (101.3/P_p)$$

Where:

(A) V<sub>o</sub> = Pump flow, m<sup>3</sup>/rev (ft<sup>3</sup>/rev) at T<sub>p</sub>, P<sub>p</sub>.

(B) Q<sub>a</sub> = Meter air flow rate in standard cubic meters per minute; standard conditions are 20°C, 101.3 kPa (68°F, 29.92 in. Hg).

(C) n = Pump speed in revolutions per minute.

(D)(1) T<sub>p</sub> = Pump inlet temperature, ( $^\circ\text{K}$ ) = PTI + 273.

(2) For English units, T<sub>p</sub> = PTI + 460.

(E)(1) P<sub>p</sub> = Absolute pump inlet pressure, kPa (in. Hg) = P<sub>B</sub> - PPI.

(2) For English units, P<sub>p</sub> = P<sub>B</sub> - PPI(S P.G.R./13.57).

Where:

(F) P<sub>B</sub> = barometric pressure, kPa (in. Hg.).

(G) PPI = Pump inlet depression, kPa (in. fluid).

(H) SP.G.R. = Specific gravity of manometer fluid relative to water.

(iii) The correlation function at each test point is then calculated from the calibration data:

$$X_o = \frac{1}{n} \sqrt{\frac{\Delta P}{P_e} P}$$

Where:

- (A)  $X_o$  = correlation function.
- (B)  $\Delta P_p$  = The pressure differential from pump inlet to pump outlet, kPa (in. Hg) =  $P_e - P_p$ .
- (C)(1)  $P_e$  = Absolute pump outlet pressure, kPa (in. Hg) =  $P_B + PPO$ .
- (2) For English units,  $P_e = P_B + PPO$  (S.P.G.R./13.57).

Where:

- (D) PPO = Pressure head at pump outlet, kPa (in. fluid).
- (iv) A linear least squares fit is performed to generate the calibration equations which have the forms:  
 $V_o = D_o - M(X_o)$   
 $n = A - B(\Delta P_p)$   
 $D_o, M, A,$  and  $B$  are the slope-intercept constants, describing the lines.

(8) A CVS system that has multiple speeds shall be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values,  $D_o$ , will increase as the pump flow range decreases.

(9) If the calibration has been performed carefully, the calculated values from the equation will be within  $\pm 0.50$  percent of the measured value of  $V_o$ . Values of  $M$  will vary from one pump to another, but values of  $D_o$  for pumps of the same make, model, and range should agree within  $\pm 3$  percent of each other. Particulate influx from use will cause the pump slip to decrease as reflected by lower values for  $M$ . Calibrations should be performed at pump startup and after major maintenance to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

(c) CFV calibration. (1) Calibration of

the Critical Flow Venturi (CFV) is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_v = \frac{K_v P}{\sqrt{T}}$$

Where:

- (i)  $Q_v$  = Flow.
  - (ii)  $K_v$  = Calibration coefficient.
  - (iii)  $P$  = Absolute pressure.
  - (iv)  $T$  = Absolute temperature.
- The calibration procedure described below establishes the value of the calibration coefficient at the measured values of pressure, temperature and air flow.
- (2) The manufacturer's recommended procedure shall be followed for calibrating electronic portions of the CFV.
- (3) Measurements necessary for flow calibration are as follows:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected).....	$P_B$ .....	kPa (in. Hg).....	$\pm 0.03$ kPa ( $\pm 0.01$ in. Hg)
Air temperature, flowmeter.....	ETI.....	$^{\circ}$ C ( $^{\circ}$ F).....	$\pm 0.15^{\circ}$ C ( $\pm 0.27^{\circ}$ F)
Pressure depression upstream of LFE.....	EPI.....	kPa (in. H <sub>2</sub> O).....	$\pm 0.01$ kPa ( $\pm 0.05$ in. H <sub>2</sub> O)
Pressure drop across LFE matrix.....	EOP.....	kPa (in. H <sub>2</sub> O).....	$\pm 0.001$ kPa ( $\pm 0.005$ in. H <sub>2</sub> O)
Air flow.....	$Q_v$ .....	$m^3/min$ ( $ft^3/min$ ).....	$\pm 0.5\%$
CFV inlet depression.....	PPI.....	kPa (in. fluid).....	$\pm 0.02$ kPa ( $\pm 0.05$ in. fluid)
Temperature at venturi inlet.....	$T_v$ .....	$^{\circ}$ C ( $^{\circ}$ F).....	$\pm 0.25^{\circ}$ C ( $\pm 0.45^{\circ}$ F)
Specific gravity of manometer fluid (1.75 oil).....	Sp Gr.....		

(4) Set up equipment as shown in Figure F78-6 and check for leaks. Any leaks between the flow measuring device and the critical flow venturi will seriously affect the accuracy of the calibration.

(5) Set the variable flow restrictor to the open position, start the blower and allow the system to stabilize. Record data from all instruments.

(6) Vary the flow restrictor and make at least 8 readings across the critical flow range of the venturi.

(7) Data analysis. The data recorded during the calibration are to be used in the following calculations:

- (i) The air flow rate,  $Q_v$ , at each test point is calculated from the flowmeter data using the manufacturer's prescribed method.
- (ii) Calculate values of the calibration coefficient for each test point:

$$K_v = \frac{Q_v \sqrt{T_v}}{P_v}$$

Where:

- (A)  $Q_v$  = Flow rate in  $m^3$ /minute, standard conditions are  $20^{\circ}$  C,  $101.3$  kPa ( $68^{\circ}$  F,  $29.92$  in. Hg)
- (B)  $T_v$  = Temperature at venturi inlet,  $^{\circ}$ K ( $^{\circ}$ R).
- (C)(1)  $P_v$  = Pressure at venturi inlet, kPa (mm Hg) =  $P_B - PPI$ .
- (2) For English units,  $P_v = P_B - PPI$  (S.P.G.R./13.57).

Where:

- (D) PPI = Venturi inlet pressure depression, kPa (in. fluid).
- (E) SP.GR. = Specific gravity of manometer fluid, relative to water.
- (iii) Plot  $K_v$  as a function of venturi inlet depression. For sonic flow,  $K_v$  will have a relatively constant value. As

pressure decreases (vacuum increases), the venturi becomes unchoked and  $K_v$  decreases (is no longer constant). See Figure F78-7.

(iv) For a minimum of 8 points in the critical region, calculate an average  $K_v$  and the standard deviation.

(v) If the standard deviation exceeds 0.3 percent of the average  $K_v$ , take corrective action.

(d) CVS system verification. The following "gravimetric" technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system. If the CVS and analytical system will be used only in the testing of gasoline-fueled vehicles, the system verification may be performed using either propane or carbon monoxide. If the CVS and analytical system will be used with

methanol-fueled vehicles as well as gasoline-fueled vehicles, system verification performance check must include a methanol check in addition to either the propane or carbon monoxide check. (Verification can also be accomplished by constant flow metering using critical flow orifice devices.)

(1) Obtain a small cylinder that has been charged with pure propane or carbon monoxide gas (caution—carbon monoxide is poisonous). Obtain another small cylinder which has been charged with pure methanol if the system will be used for methanol-fueled vehicle testing. Since this cylinder will be heated to 150–155 °F, care must be taken to ensure that the liquid volume of methanol placed in the cylinder does not exceed approximately one-half of the total volume of the cylinder.

(2) Determine a reference cylinder weight to the nearest 0.01 grams.

(3) Operate the CVS in the normal manner and release a quantity of pure propane or carbon monoxide into the system during the sampling period (approximately 5 minutes).

(4) Following the completion of paragraph (d)(3) of this section, continue to operate the CVS in the normal manner and release a quantity of pure methanol into the system during the sampling period (approximately 5 minutes).

(5) The calculations of § 86.544 are performed in the normal way except in the case of propane. The density of propane (0.6109 kg/m<sup>3</sup>/carbon atom (17.30 g/ft<sup>3</sup>/carbon atom)) is used in place of the density of exhaust hydrocarbons. In the case of carbon monoxide, the density of 1.164 kg/m<sup>3</sup> (32.97 g/ft<sup>3</sup>) is used. In the case of methanol, the density of 1.332 kg/m<sup>3</sup> (37.71 g/ft<sup>3</sup>) is used.

(6) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to

determine the percent accuracy of the system.

(7) The cause for any discrepancy greater than  $\pm 2$  percent must be found and corrected.

65. A new § 86.521–90 is added to Subpart F, to read as follows:

**§ 86.521–90 Hydrocarbon analyzer calibration.**

(a) The FID hydrocarbon analyzer shall receive the following initial and periodic calibration. The HFID used with methanol-fueled vehicles shall be operated at 235°F $\pm$ 15 °F (113°C $\pm$ 8 °C).

(b) *Initial and periodic optimization of detector response.* Prior to its introduction into service and at least annually thereafter, the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow the manufacturer's instructions or good engineering practice for instrument startup and basic operating adjustment using the appropriate FID fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer a propane in air mixture (methanol in air mixture for methanol-fueled vehicles when optional methanol calibrated FID procedure is used during the 1990 through 1994 model years) with a propane (or methanol) concentration equal to approximately 90 percent of the most common operating range.

(3) Select an operating FID fuel flow rate that will give near maximum response and least variation in response with minor fuel flow variations.

(4) To determine the optimum air flow, use the FID fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, record them for future reference.

*(c) Initial and periodic calibration.*

Prior to its introduction into service and monthly thereafter the FID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges, and, if applicable, the methanol response factor shall be determined (paragraph (d) of this section). Use the same flow rate as when analyzing sample.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero grade air.

(3) Calibrate on each normally used operating range with propane in air calibration gases (methanol in air as appropriate) having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(d) *FID response factor to methanol.* When the FID analyzer is to be used for the analysis of hydrocarbon samples containing methanol, the methanol response factor of the analyzer shall be established. The methanol response factor shall be determined at several concentrations in the range of concentrations in the exhaust sample.

(1) The bag sample of methanol for analysis in the FID shall be prepared using the apparatus shown in Figure F90–4. A known volume of methanol is injected, using a microliter syringe, into the heated mixing zone (250 °F (121°C)) of the apparatus. The methanol is vaporized and swept into the sample bag with a known volume of zero grade air measured by a dry gas meter.

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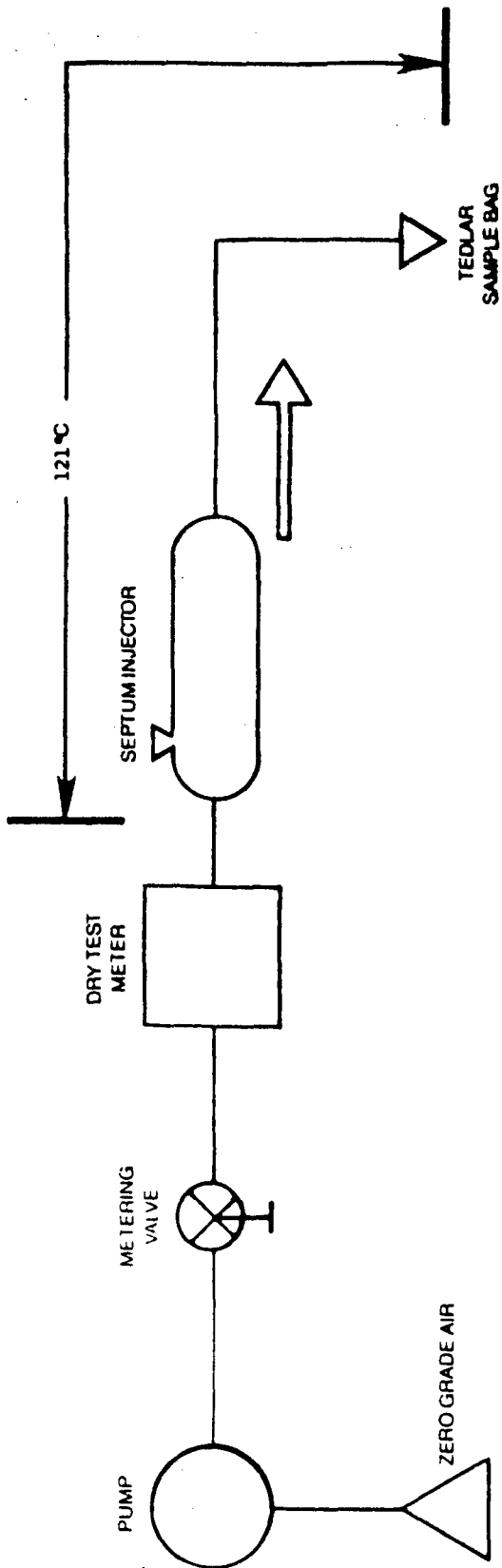


FIGURE F-90-4 APPARATUS FOR PREPARATION OF FID METHANOL RESPONSE CALIBRATION MIX

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(2) The bag sample is analyzed using the FID.

(3) The FID response factor,  $r$ , is calculated as follows:

$$r = \text{FID}_{\text{ppm}} / \text{SAM}_{\text{ppm}}$$

Where:

- (i)  $r$  = FID response factor.
- (ii)  $\text{FID}_{\text{ppm}}$  = FID reading, ppmC.
- (iii)  $\text{SAM}_{\text{ppm}}$  = methanol concentration in the sample bag, ppmC.

$$\frac{0.02406 \times \text{Fuel injected} \times \text{Fuel density}}{\text{Air volume} \times \text{Mol. Wt. CH}_3\text{OH}}$$

Air volume  $\times$  Mol. Wt. CH<sub>3</sub>OH

Where:

(iv) 0.02406 = Volume of one mole at 101.3 kPa (29.92 in. Hg) and 20 °C (68 °F), m<sup>3</sup>.

(v) Fuel injected = Volume of methanol injected, ml.

(vi) Fuel Density = Density of methanol, 0.7914 g/ml

(vii) Air volume = Volume of zero grade air, m<sup>3</sup>

(viii) Mol. Wt. CH<sub>3</sub>OH = 32.04

66. A new § 86.526-90 is added to Subpart F, to read as follows:

**§ 86.526-90 Calibration of other equipment.**

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice. Specific equipment requiring calibration is the gas chromatograph and flame ionization detector used in measuring methanol and the high pressure liquid chromatograph (HPLC) and ultraviolet detector for measuring formaldehyde.

67. A new § 86.527-90 is added to Subpart F, to read as follows:

**§ 86.527-90 Test procedures, overview.**

(a) The procedures described in this and subsequent sections are used to determine the conformity of vehicles with the standards set forth in Subpart E.

(b) The overall test consists of prescribed sequences of fueling, parking, and operating conditions.

(c) The exhaust emission test is designed to determine hydrocarbon (gasoline-fueled vehicles), methanol, formaldehyde, and hydrocarbon (methanol-fueled vehicles), carbon monoxide, and oxides of nitrogen mass emissions while simulating an average trip in an urban area. The test consists of engine startups and vehicle operation on a chassis dynamometer, through a specified driving schedule. A proportional part of the diluted exhaust emissions is collected continuously for

subsequent analysis, using a constant volume (variable dilution) sampler.

(d) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this Subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with Subpart E.

68. A new § 86.535-90 is added to Subpart F, to read as follows:

**§ 86.535-90 Dynamometer procedure.**

(a) The dynamometer run consists of two tests, a "cold" start test and a "hot" start test following the "cold" start by 10 minutes. Engine startup (with all accessories turned off), operation over the driving schedule, and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbons, carbon monoxide, carbon dioxide, and, optionally, for oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and, optionally, for oxides of nitrogen. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles (a single dilution air formaldehyde sample covering the total time of the test may be collected in place of individual test phases).

(b) [Reserved]

(c) The vehicle speed, as measured from the dynamometer roll, shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(d) Practice runs over the prescribed driving schedule may be performed at test points, provided an emission sample is not taken, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit sampling system adjustments.

(e) The drive wheel tires must be inflated to the manufacturer's recommended pressure,  $\pm 15$  kPa ( $\pm 2.2$  psi). The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the two-hour period immediately preceding the test, it shall be warmed up for 15 minutes by operating at 50 km/h (31 mph) using a

nontest vehicle, or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, it shall be set within one hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make this adjustment. Dynamometers using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

(h) The driving distance, as measured by counting the number of dynamometer roll revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test.

69. A new § 86.537-90 is added to Subpart F, to read as follows:

**§ 86.537-90 Dynamometer test runs.**

(a) The vehicle shall be allowed to stand with the engine turned off (see § 86.532 for required time). The vehicle shall be stored prior to the emission test in such a manner that precipitation (e.g., rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 12.0 km (7.5 mi), (10.9 km (6.8 mi) for Class I motorcycles) and simulates a hot start drive of 12.0 km (7.5 mi), (10.9 km (6.8 mi) for Class I motorcycles). The vehicle is allowed to stand on the dynamometer during the 10-minute period between the cold and hot start tests. The cold start is divided into two periods. The first period, representing the cold start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of the driving schedule including engine shutdown. The hot start test similarly consists of two periods. The period, representing the hot start "transient" phase, terminates at the same point in the driving schedule at the first point of the cold start test. The second period of the hot start test, "stabilized" phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(b) The following steps shall be taken for each test:

(1) Place drive wheel of vehicle on dynamometer without starting engine.

(2) Activate vehicle cooling fan.

(3) For all vehicles, with the sample selector valves in the "standby" position connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(4) For methanol-fueled vehicles, with the sample selector valves in the

"standby" position, insert fresh sample collection impingers into the methanol sample collection system, fresh collection impingers or capsules into the formaldehyde sample collection system, and fresh impingers (or capsules for formaldehyde) into the dilution air sample collection systems for methanol and formaldehyde (may be omitted for 1990 through 1994 model years).

(5) Start the CVS (if not already on), the sample pumps and the temperature recorder. (The heat exchanger of the constant volume sampler, if used, methanol-fueled vehicle hydrocarbon analyzer and sample lines should be preheated to their respective operating temperatures before the test begins.)

(6) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

(i) For gaseous bag samples (except hydrocarbon samples), the minimum flow rate is 0.17 cfm (0.08 l/s).

(ii) For hydrocarbon samples, the minimum FID (or HFID in the case of methanol-fueled vehicles) flow rate is 0.066 cfm (0.031 l/s).

(iii) For methanol samples, the minimum flow rate is 0.14 cfm (0.067 l/s).

(iv) For formaldehyde samples, the minimum flow rate is 0.036 cfm (0.017 l/s) with capsule collector and 0.014 cfm (0.007 l/s) with impinger.

Note: CFV sample flow rate is fixed by the venturi design.

(7) Attach the flexible exhaust tube to the vehicle tailpipe(s).

(8) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the "transient" exhaust sample bag, the "transient" methanol exhaust sample, the "transient" formaldehyde exhaust sample, the "transient" dilution air sample bag, the "transient" methanol dilution air sample and the "transient" formaldehyde dilution air sample, turn the key on, and start cranking the engine.

(9) Fifteen seconds after the engine starts, place the transmission in gear.

(10) Twenty seconds after the engine starts, begin the initial vehicle acceleration of the driving schedule.

(11) Operate the vehicle according to the Urban Dynamometer Driving Schedule (§ 86.515).

(12) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously switch the sample flows from the "transient" bags and samples to the "stabilized" bags and samples, switch off gas flow measuring device No. 1, and start gas flow measuring device No. 2. Before the acceleration which is scheduled to occur

at 510 seconds, record the measured roll or shaft revolutions and reset the counter or switch to a second counter.

As soon as possible transfer the "transient" exhaust and dilution air samples to the analytical system and process the samples according to § 86.540 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test (if it is not possible to perform analysis on the methanol and formaldehyde samples within 24 hours, the samples should be stored in a dark, cold (approximately 0 °C) environment until analysis).

(13) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(14) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 and position the sample selector valves to the "standby" position. Record the measured roll or shaft revolutions, (both gas meter or flow measurement instrumentation readings), and re-set the counter. As soon as possible, transfer the "stabilized" exhaust and dilution air samples to the analytical system and process the samples according to the § 86.540, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period (if it is not possible to perform analysis on the methanol and formaldehyde samples within 24 hours, the samples should be stored in a dark, cold (~ 0 °C) environment until analysis).

(15) Immediately after the end of the sample period, turn off the cooling fan.

(16) Turn off the CVS or disconnect the exhaust tube from the tailpipe(s) of the vehicle.

(17) Repeat the steps in paragraph (b) (2) through (11) of this section for the hot start test, except only two evacuated sample bags, two methanol sample impingers, two formaldehyde sample impingers are required. The step in paragraph (b)(8) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold start test.

(18) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously turn off gas flow measuring device No. 1 and position the sample selector valve to the "standby" position. (Engine shutdown is not part of the hot start test sample

period.) Record the measured roll or shaft revolutions.

(19) As soon as possible, transfer the hot start "transient" exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.540 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period (if it is not possible to perform analysis on the methanol and formaldehyde samples within 24 hours, the samples should be stored in a dark, cold (~ 0 °C) environment until analysis).

(20) Disconnect the exhaust tube from the vehicle tailpipe(s) and remove the vehicle from dynamometer.

(21) The CVS or CFV may be turned off, if desired.

(22) Continuous monitoring of exhaust emissions will not normally be allowed. Specific written approval must be obtained from the Administrator for continuous monitoring of exhaust emissions.

70. A new § 86.540-90 is added to Subpart F, to read as follows:

#### § 86.540-90 Exhaust sample analysis.

The following sequence of operations shall be performed in conjunction with each series of measurements:

(a) For CO, CO<sub>2</sub>, gasoline-fueled and methanol-fueled vehicle HC, and, if appropriate, NO<sub>x</sub>:

(1) Zero the analyzers and obtain a stable zero reading. Recheck after tests.

(2) Introduce span gases and set instrument gains. In order to avoid errors, span and calibrate at the same flow rates used to analyze the test sample. Span gases should have concentrations equal to 75 to 100 percent of full scale. If gain has shifted significantly on the analyzers, check the calibrations. Show actual concentrations on chart.

(3) Check zeros; repeat the procedure in paragraphs (a) (1) and (2) of this section if required.

(4) Check flow rates and pressures.

(5) Measure HC, CO, CO<sub>2</sub>, and, if appropriate, NO<sub>x</sub>, concentrations of samples.

(6) Check zero and span points. If difference is greater than 2 percent of full scale, repeat the procedure in paragraphs (a) (1) through (5) of this section.

(b) For CH<sub>3</sub>OH (methanol-fueled vehicles):

(1) Introduce a reference sample of methanol (the concentration of methanol



in deionized water is known, and is  $C_{MR}$  in the calculations) into the gas chromatograph and measure the area of the response peak. This reference sample peak area is  $A_{MR}$  in the calculations.

(2) Introduce test samples into the gas chromatograph and measure the area of the response peak. This peak area is  $A_{MS}$  in the calculations.

(c) For HCHO (methanol-fueled vehicles):

(1) Introduce a reference sample of formaldehyde (the concentration of formaldehyde as a dinitrophenylhydrazine derivative in acetonitrile ( $C_{FR}$ ) is known) into the high pressure liquid chromatograph and measure the area of the response peak. This reference sample peak area is  $A_{FR}$  in the calculations.

(2) Introduce test samples into the high pressure liquid chromatograph and measure the area of the responses peak. This peak area is  $A_{FS}$  in the calculations.

71. A new § 86.542-90 is added to Subpart F, to read as follows:

**§ 86.542-90 Records required.**

The following information shall be recorded with respect to each test:

- (a) Test number.
- (b) System or device tested (brief description).
- (c) Date and time of day for each part of the test schedule.
- (d) Instrument operator.
- (e) Driver or operator.
- (f) *Vehicle:* Make, Vehicle identification number, Model year, Transmission type, Odometer reading at initiation of preconditioning, Engine displacement, Engine family, Emission control system, Recommended idle RPM, Nominal fuel tank capacity, Inertial loading, Actual curb mass recorded at 0 kilometers, and Drive wheel tire pressure.

(g) *Dynamometer serial number:* As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided the test cell records show the pertinent instrument information.

(h) All pertinent instrument information such as tuning-gain-serial number-detector number-range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder Charts: Identify zero, span, exhaust gas, and dilution air sample traces.

(j) Test cell barometric pressure, ambient temperature and humidity.

**Note:** A central laboratory barometer may be used; *Provided*, that individual test cell barometric pressures are shown to be within  $\pm 0.1$  percent of the barometric pressure at the central barometer location.

(k) [Reserved]

(l) Pressure of the mixture of exhaust and dilution air entering the CVS metering device, the pressure increase across the device, and the temperature at the inlet. The temperature may be recorded continuously or digitally to determine temperature variations.

(m) The number of revolutions of the positive displacement pump accumulated during each test phase while exhaust samples are being collected. The number of standard cubic meters metered by a critical flow venturi during each test phase would be the equivalent record for a CFV-CVS.

(n) The humidity of the dilution air.

**Note:** If conditioning columns are not used (see §§ 86.522 and 86.544) this measurement can be deleted. If the conditioning columns are used and the dilution air is taken from the test cell, the ambient humidity can be used for this measurement.

(o) The driving distance for each of the three phases of test, calculated from the measured roll or shaft revolutions.

(p) *Additional required records for methanol-fueled vehicles:* (1) Specification of the methanol fuel used during testing.

(2) Volume of sample passed through the methanol sampling system and the volume of deionized water in each impinger.

(3) The methanol concentration in the reference sample and the peak area from the GC analysis of the reference sample.

(4) The peak area of the GC analyses of the test samples (methanol).

(5) Volume of sample passed through the formaldehyde sampling system.

(6) The formaldehyde concentration in the reference sample and the peak area from the HPLC analysis of the reference sample.

(7) The peak area of the HPLC analysis of the test sample (formaldehyde).

72. A new § 86.544-90 is added to Subpart F, to read as follows:

**§ 86.544-90 Calculations; exhaust emissions.**

The final reported test results, with oxides of nitrogen being optional, shall

be computed by use of the following formula: (The results of all emission tests shall be rounded, using the "Rounding-Off Method" specified in ASTM E 29-67, to the number of places to the right of the decimal point indicated by expressing the applicable standard to three significant figures.)

$$(a) Y_{wm} = 0.43 \left( \frac{Y_{ct} + Y_s}{D_{ct} + D_s} \right) + 0.57 \left( \frac{Y_{ht} + Y_s}{D_{ht} + D_s} \right)$$

Where:

(1)  $Y_{wm}$  = Weighted mass emissions of  $CO_2$  or of each pollutant (*i.e.*, HC, CO, or  $NO_x$ ) in grams per vehicle kilometer and if appropriate, the weighted carbon mass equivalent of organic material hydrocarbon equivalent, in grams per vehicle kilometer.

(2)  $Y_{ct}$  = Mass emissions as calculated from the "transient" phase of the cold-start test, in grams per test phase.

(3)  $Y_{ht}$  = Mass emissions as calculated from the "transient" phase of the hot-start test, in grams per test phase.

(4)  $Y_s$  = Mass emissions as calculated from the "stabilized" phase of the cold-start test, in grams per test phase.

(5)  $D_{ct}$  = The measured driving distance from the "transient" phase of the cold-start test, in kilometers.

(6)  $D_{ht}$  = The measured driving distance from the "transient" phase of the hot-start test, in kilometers.

(7)  $D_s$  = The measured driving distance from the "stabilized" phase of the cold-start test, in kilometers.

(b) The mass of each pollutant for each phase of both the cold-start test and the hot-start test is determined from the following:

(1) Hydrocarbon mass:  
 $HC_{mass} = V_{mix} \times \text{Density}_{HC} \times (HC_{conc} / 1,000,000)$

(2) Oxides of nitrogen mass:  
 $NO_{xmass} = V_{mix} \times \text{Density}_{NO_2} \times K_H \times (NO_{xconc} / 1,000,000)$

(3) Carbon monoxide mass:  
 $CO_{mass} = V_{mix} \times \text{Density}_{CO} \times (CO_{conc} / 1,000,000)$

(4) Carbon dioxide mass:  
 $CO_{2mass} = V_{mix} \times \text{Density}_{CO_2} \times (CO_{2conc} / 100)$

(5) Methanol mass:  
 $CH_3OH_{mass} = V_{mix} \times \text{Density}_{CH_3OH} \times (CH_3OH_{conc} / 1,000,000)$

(6) Formaldehyde mass:  
 $HCHO_{mass} = V_{mix} \times \text{Density}_{HCHO} \times (HCHO_{conc} / 1,000,000)$

(7) Organic material hydrocarbon equivalent:

(i)  $OMHCE =$

$$HC_{Mass} + \frac{13.8756}{32.042} (CH_3OH)_{Mass} + \frac{13.8756}{30.0262} (HCHO)_{Mass}$$

(c) Meaning of symbols:

(1)(i)  $HC_{mass}$  = Hydrocarbon emissions, in grams per test phase.

(ii)  $Density_{HC}$  = Density of hydrocarbon in the exhaust gas, 576.8 g/m<sup>3</sup>/carbon atom (16.33 g/ft<sup>3</sup>/carbon atom), assuming an average carbon to hydrogen ratio of 1:1.85, at 20 °C (68 °F) and 101.3 kPa (760 mm Hg) pressure.

(iii)(A)  $HC_{conc}$  = Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent, *i.e.*, equivalent propane x 3.

(B)  $HC_{conc} = HC_e - HC_d(1 - (1/DF))$   
Where:

(iv)(A)  $HC_e$  = Hydrocarbon concentrations of the dilute exhaust sample as measured, in ppm carbon equivalent (propane ppm x 3).

(B)  $HC_e = FID_{HC_e} - (r)C_{CH_3OH_e}$

(v)  $FID_{HC_e}$  = Concentration of hydrocarbon plus methanol in dilute exhaust as measured by the FID, ppm carbon equivalent.

(vi)  $r$  = FID response to methanol.

(vii)  $C_{CH_3OH_e}$  = Concentration of methanol in dilute exhaust as determined from the dilute exhaust methanol sample, ppm carbon.

(viii)(A)  $HC_d$  = Hydrocarbon concentration of the dilution air as measured, ppm carbon equivalent.

(B)  $HC_d = FID_{HC_d} - (r)C_{CH_3OH_d}$

(ix)  $FID_{HC_d}$  = Concentration of hydrocarbon plus methanol in dilution air as measured by the FID, ppm carbon equivalent.

(x)  $C_{CH_3OH_d}$  = Concentration of methanol in dilution air as determined from dilution air methanol sample, ppm carbon.

(2)(i)  $NOx_{mass}$  = Oxides of nitrogen emissions, grams per test phase.

(ii)  $Density_{NO_2}$  = Density of oxides of nitrogen in the exhaust gas, assuming they are in the form of nitrogen dioxide,

1913 g/m<sup>3</sup> (54.16 g/ft<sup>3</sup>), at 20 °C (68 °F) and 101.3 kPa (760 mm Hg) pressure.

(iii)(A)  $NOx_{conc}$  = Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, ppm.

(B)  $NOx_{conc} = NOx_e - NOx_d(1 - (1/DF))$   
Where:

(iv)  $NOx_e$  = Oxides of nitrogen concentration of the dilute exhaust sample as measured, ppm.

(v)  $NOx_d$  = Oxides of nitrogen concentration of the dilution air as measured, ppm.

(3)(i)  $CO_{mass}$  = Carbon monoxide emissions, in grams per test phase.

(ii)  $Density_{CO}$  = Density of carbon monoxide, 1164 g/m<sup>3</sup> (32.97 g/ft<sup>3</sup>), at 20 °C (68 °F) and 101.3 kPa (760 mm Hg) pressure.

(iii)(A)  $CO_{conc}$  = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO<sub>2</sub> extraction, ppm.

(B)  $CO_{conc} = CO_e - CO_d(1 - (1/DF))$   
Where:

(iv)(A)  $CO_e$  = Carbon monoxide concentration of the dilute exhaust sample volume corrected for water vapor and carbon dioxide extraction, in ppm.

(B)  $CO_e = (1 - 0.01925CO_{2e} - 0.000323R)CO_{em}$  for gasoline-fueled vehicles with hydrogen to carbon ratio of 1.85:1

(C)  $CO_e = [1 - (0.01 + 0.005HCR)CO_{2e} - 0.000323R]CO_{em}$  for methanol-fueled vehicles, where HCR is hydrogen to carbon ratio as measured for the fuel used.

(v)  $CO_{em}$  = Carbon monoxide concentration of the dilute exhaust sample as measured, ppm

(vi)  $CO_{2e}$  = Carbon dioxide concentration of the dilute exhaust sample, pct.

(vii)  $R$  = Relative humidity of the dilution air, pct (*see* § 86.542(n)).

(viii)(A)  $CO_d$  = Carbon monoxide concentration of the dilution air corrected for water vapor extraction, ppm.

(B)  $CO_d = (1 - 0.000323R)CO_{dm}$   
Where:

(ix)  $CO_{dm}$  = Carbon monoxide concentration of the dilution air sample as measured, ppm.

Note: If a CO instrument which meets the criteria specified in § 86.511 is used and the conditioning column has been deleted,  $CO_{em}$  can be substituted directly for  $CO_e$  and  $CO_{dm}$  must be substituted directly for  $CO_d$ .

(4)(i)  $CO_{2mass}$  = Carbon dioxide emissions, grams per test phase.

(ii)  $Density_{CO_2}$  = Density of carbon dioxide, 1830 g/m<sup>3</sup> (51.81 g/ft<sup>3</sup>), at 20 °C (68 °F) and 101.3 kPa (760 mm Hg) pressure.

(iii)(A)  $CO_{2conc}$  = carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.

(B)  $CO_{2conc} = CO_{2e} - CO_{2d}(1 - (1/DF))$   
Where:

(iv)  $CO_{2d}$  = Carbon dioxide concentration of the dilution air as measured, in percent.

(5)(i)  $CH_3OH_{mass}$  = Methanol emissions corrected for background, grams per test phase.

(ii)  $Density_{CH_3OH}$  = Density of methanol is 1332 g/m<sup>3</sup> (37.71 g/ft<sup>3</sup>), at 20 °C (68 °F) and 101.3 kPa (760 mm Hg) pressure.

(iii)(A)  $CH_3OH_{conc}$  = Methanol concentration of the dilute exhaust corrected for background, ppm.

(B)  $CH_3OH_{conc} = C_{CH_3OH_e} - C_{CH_3OH_d}(1 - (1/DF))$   
Where:

(iv)(A)  $C_{CH_3OH_e}$  = Methanol concentration in the dilute exhaust, ppm.

(B)

$$C_{CH_3OH_e} = \frac{3.813 \times 10^{-2} \times C_{CH_3OH_R} \times T_{EM} [(A_{S1} \times AV_{S1}) + (A_{S2} \times AV_{S2})]}{A_{CH_3OH_R} \times P_B \times V_{EM}}$$

(v)(A)  $C_{CH_3OH_d}$  = Methanol concentration in the dilution air, ppm.

$$(B) C_{CH_3OHd} = \frac{3.813 \times 10^{-2} \times C_{CH_3OHR} \times T_{DM} [(A_{D1} \times AV_{D1}) + (A_{D2} \times AV_{D2})]}{A_{CH_3OHR} \times P_B \times V_{DM}}$$

(vi)  $C_{CH_3OHR}$  = Concentration of methanol in standard sample for calibration of GC,  $\mu\text{g/ml}$ .

(vii)  $A_{CH_3OHR}$  = GC peak area of standard sample.

(viii)  $T_{EM}$  = Temperature of methanol sample withdrawn from dilute exhaust,  $^{\circ}\text{R}$ .

(ix)  $T_{DM}$  = Temperature of methanol sample withdrawn from dilution air,  $^{\circ}\text{R}$ .

(x)  $P_B$  = Barometric pressure during test, mm Hg.

(xi)  $V_{EM}$  = Volume of methanol sample withdrawn from dilute exhaust,  $\text{ft}^3$ .

(xii)  $V_{DM}$  = Volume of methanol sample withdrawn from dilution air,  $\text{ft}^3$ .

(xiii)  $A_s$  = GC peak area of sample drawn from dilute exhaust.

(xiv)  $A_D$  = GC peak area of sample drawn from dilution air.

(xv)  $AV_s$  = Volume of absorbing reagent (deionized water) in impinger through which methanol sample from dilute exhaust is drawn, ml.

(xvi)  $AV_D$  = Volume of absorbing reagent (deionized water) in impinger through which methanol sample from dilution air is drawn, ml.

(xvii) 1 = first impinger.

(xviii) 2 = second impinger.

(6)(i)  $\text{HCHO}_{\text{mans}}$  = Formaldehyde emissions corrected for background, grams per test phase.

(ii)  $\text{Density}_{\text{HCHO}}$  = Density of formaldehyde is  $1249 \text{ g/m}^3$  ( $35.36 \text{ g/ft}^3$ ), at  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ) and  $101.3 \text{ kPa}$  ( $760 \text{ mm Hg}$ ) pressure.

(iii)(A)  $\text{HCHO}_{\text{conc}}$  = Formaldehyde concentration of the dilute exhaust corrected for background, ppm.

(B)  $\text{HCHO}_{\text{conc}} = C_{\text{HCHOe}} - C_{\text{HCHOd}} (1 - (1/DF))$

Where:

(iv)(A)  $C_{\text{HCHOe}}$  = Formaldehyde concentration in dilute exhaust, ppm.

$$(B) C_{\text{HCHOe}} = \frac{4.069 \times 10^{-2} \times C_{\text{FD E}} \times V_{\text{AE}} \times Q \times T_{\text{EF}}}{V_{\text{SE}} \times P_B}$$

(v)(A)  $C_{\text{HCHOd}}$  = Formaldehyde concentration in dilution air, ppm.

$$(B) C_{\text{HCHOd}} = \frac{4.069 \times 10^{-2} \times C_{\text{FDA}} \times V_{\text{AA}} \times Q \times T_{\text{DF}}}{V_{\text{SA}} \times P_B}$$

(vi)  $C_{\text{FDE}}$  = Concentration of DNPH derivative of formaldehyde from dilute exhaust sample in sampling solution,  $\mu\text{g/ml}$ .

(vii)  $V_{\text{AE}}$  = Volume of sampling solution for dilute exhaust formaldehyde sample, ml.

(viii)(A)  $Q$  = Ratio of molecular weights of formaldehyde to its DNPH derivative.

(B)  $Q = 0.1429$

(ix)  $T_{\text{EF}}$  = Temperature of formaldehyde sample withdrawn from dilute exhaust,  $^{\circ}\text{R}$ .

(x)  $V_{\text{SE}}$  = Volume of formaldehyde sample withdrawn from dilute exhaust,  $\text{ft}^3$ .

(xi)  $P_B$  = Barometric pressure during test, mm Hg.

(xii)  $C_{\text{FDA}}$  = Concentration of DNPH derivative of formaldehyde from dilution air sample in sampling solution,  $\mu\text{g/ml}$ .

(xiii)  $V_{\text{AA}}$  = Volume of sampling solution for dilution air formaldehyde sample, ml.

(xiv)  $T_{\text{DF}}$  = Temperature of formaldehyde sample withdrawn from dilution air,  $^{\circ}\text{R}$ .

(xv)  $V_{\text{SA}}$  = Volume of formaldehyde sample withdrawn from dilution air,  $\text{ft}^3$ .

(7)(i)  $DF = 13.4 / [\text{CO}_{2e} + (\text{HC}_e + \text{CO}_e) \times 10^{-4}]$  for gasoline-fueled vehicles.

$$(ii) DF = \frac{100 \times \left( \frac{x}{x + y/2 + 3.76(x + y/4 - z/2)} \right)}{\text{CO}_{2e} + (\text{HC}_e + \text{CO}_e + C_{\text{CH}_3\text{OHe}}) \times 10^{-4}}$$

for methanol-fueled vehicles where fuel composition is  $\text{C}_x\text{H}_y\text{O}_z$  as measured for the fuel used.

(iii)(A)  $V_{\text{mix}}$  = Total dilute exhaust

volume in cubic meters per test phase corrected to standard conditions ( $293^{\circ}\text{K}$  ( $528^{\circ}\text{R}$ ) and  $101.3 \text{ kPa}$  ( $760 \text{ mm Hg}$ )).

(B)

$$V_{\text{mix}} = \frac{V_o \times N \times (P_B - P_i) \times 293}{101.3 \times T_p}$$

Where:

(iv)  $V_o$  = Volume of gas pumped by the positive displacement pump, in cubic meters per revolution. This volume is dependent on the pressure differential across the positive displacement pump. (See calibration techniques in § 86.519.)

(v)  $N$  = Number of revolutions of the positive displacement pump during the test phase while samples are being collected.

(vi)  $P_B$  = Barometric pressure, kPa.

(vii)  $P_i$  = Pressure depression below atmospheric measured at the inlet to the positive displacement pump, kPa.

(viii)  $T_p$  = Average temperature of dilute exhaust entering positive displacement pump during test while samples are being collected, °K.

(ix)(A)  $K_h$  = Humidity correction factor.

(B)  $K_h = 1/[1 - 0.0329(H - 10.71)]$

Where:

(x)(A)  $H$  = Absolute humidity in grams of water per kilogram of dry air.

(B)  $H = [(6.211)R_a \times P_d] / [P_B - (P_d \times R_a / 100)]$

(xi)  $R_a$  = Relative humidity of the ambient air, pct.

(xii)  $P_d$  = Saturated vapor pressure, in kPa at the ambient dry bulb temperature.

(xiii)  $P_B$  = Barometric pressure, kPa.

(d) Sample calculation of mass emission values for gasoline-fueled vehicles with engine displacements equal to or greater than 170 cc (10.4 cu. in.):

(1) For the "transient" phase of the cold-start test, assume  $V_o = 0.0077934 \text{ m}^3$  per rev;  $N = 12,115$ ;  $R = 20.5$  pct;  $R_a = 20.5$  pct;  $P_B = 99.05$  kPa;  $P_d = 3.382$  kPa;  $P_i = 9.851$  kPa;  $T_p = 309.8$  °K;  $HC_e = 249.75$  ppm carbon equivalent;  $NOx_e = 38.30$  ppm;  $CO_{em} = 311.23$  ppm;  $CO_{2e} = 0.415$  percent;  $HC_d = 4.90$  ppm;  $NOx_d = 0.30$  ppm;  $CO_{dm} = 8.13$  ppm;  $CO_{2d} = 0.037$  pct;  $D_{ct} = 5.650$  km.

Then:

(i)  $V_{mix} = [(0.0077934)(12,115)(99.05 - 9.851)(293.15)] / [(101.325)(309.8)] = 78.651 \text{ m}^3$  per test phase.

(ii)  $H = [(6.211)(20.5)(3.382)] / [(99.05) - (3.382)(20.5/100)] = 4.378$  grams  $H_2O$  per kg dry air.

(iii)  $K_h = 1/[1 - 0.0329(4.378 - 10.71)] = 0.8276$

(iv)  $CO_e = [1 - 0.01925(0.415) - 0.000323(20.5)](311.23) = 306.68$  ppm.

(v)  $CO_d = [1 - 0.000323(20.5)](8.13) = 8.08$  ppm.

(vi)  $DF = 13.4/[0.415 + (249.75 + 306.68)10^{-4}] = 28.472$

(vii)  $HC_{conc} = 249.75 - 4.90(1 - 1/28.472) = 245.02$  ppm.

(viii)  $HC_{mass} = (78.651)(576.8)(245.02)10^{-6} = 11.114$  grams per test phase.

(ix)  $NOx_{conc} = 38.30 - 0.30(1 - 1/28.472) = 38.01$  ppm.

(x)

$NOx_{mass} = (78.651)(1913)(38.01)(0.8276) \times 10^{-6} = 4.733$  grams per test phase.

(xi)  $CO_{conc} = 306.68 - 8.08(1 - 1/28.472) = 298.88$  ppm.

(xii)  $CO_{mass} = (78.651)(1164)(298.88)10^{-6} = 27.362$  grams per test phase.

(xiii)  $CO_{2conc} = 0.415 - 0.037(1 - 1/28.472) = 0.3793$  percent.

(xiv)  $CO_{2mass} = (78.651)(1843)(0.3793)/100 = 549.81$  grams per test phase.

(2) For the "stabilized" portion of the cold-start test, assume that similar calculations resulted in  $HC_{mass} = 7.184$  grams per test phase;  $NOx_{mass} = 2.154$  grams per test phase;  $CO_{mass} = 64.541$  grams per test phase; and  $CO_{2mass} = 529.52$  grams per test phase.  $D_{ct} = 6.070$  km.

(3) For the "transient" portion of the hot-start test, assume that similar calculations resulted in  $HC_{mass} = 6.122$  grams per test phase;  $NOx_{mass} = 7.056$  grams per test phase;  $CO_{mass} = 34.964$  grams per test phase; and  $CO_{2mass} = 480.93$  grams per test phase.  $D_{ct} = 5.660$  km.

(4) For a 1978 motorcycle with an engine displacement equal to or greater than 170 cc (10.4 cu. in.):

(i)  $HC_{wm} = 0.43 [(11.114 + 7.184)/(5.650 + 6.070)] + 0.57 [(6.122 + 7.184)/(5.660 + 6.070)] = 1.318$  grams per vehicle kilometer.

(ii)  $NOx_{wm} = 0.43 [(4.733 + 2.154)/(5.650 + 6.070)] + 0.57 [(7.056 + 2.154)/(5.660 + 6.070)] = 0.700$  gram per vehicle kilometer.

(iii)  $CO_{wm} = 0.43 [(27.362 + 64.541)/(5.650 + 6.070)] + 0.57 [(34.964 + 64.541)/(5.660 + 6.070)] = 8.207$  grams per vehicle kilometer.

(iv)  $CO_{2wm} = 0.43 [(549.81 + 529.52)/(5.650 + 6.070)] + 0.57 [(480.93 + 529.52)/(5.660 + 6.070)] = 88.701$  grams per vehicle kilometer.

(e) For methanol-fueled vehicle with measured fuel composition of  $CH_{3.14}O_{0.6}$  example calculation of exhaust emissions using positive displacement pump:

(1) For the "transient" phase of the cold start test assume the following:

$V_o = 0.29344 \text{ ft}^3/\text{rev}$ ;  $N = 10,485$ ;  
 $R = 48.0$  pct;  $R_a = 48.2$  pct;  $P_B = 762$  mm Hg;  $P_d = 22.225$  mm Hg;  $P_i = 70$  mm Hg;  $T_p = 570^\circ\text{R}$ ;  $FID = HCE = 81.6$  ppm, carbon equivalent;  $r = 0.75$ ;  $C_{CH_3OHR} = 71$  ug/ml;  $T_{EM} = 567^\circ\text{R}$ ;  $A_{CH_3OHR} = 3660$ ;  $V_{EM} = 1.18 \text{ ft}^3$ ;  $A_{S1} = 4460$ ;  $AV_{S1} = 25.2$  ml;  $A_{S2} = 360$ ;  $AV_{S2} = 24.9$  ml;  $T_{DM} = 532^\circ\text{R}$ ;  $V_{DM} = 1.17 \text{ ft}^3$ ;  $A_{D1} = 110$ ;  $AV_{D1} = 25.0$  ml;  $A_{D2} = 10$ ;  $AV_{D2} = 25.1$  ml;  $C_{FDE} = 20$  ug/ml;  $V_{AE} = 5.0$  ml;  $Q = 0.1429$ ;  $T_{EF} = 569^\circ\text{R}$ ;  $V_{SE} = 0.30 \text{ ft}^3$ ;  $C_{FDA} = 1$  ug/ml;  $V_{AA} = 5.0$  ml;  $T_{DF} = 532^\circ\text{R}$ ;  $V_{SA} = 0.31 \text{ ft}^3$ ;  $NOx_e = 11.2$  ppm;  $CO_{em} = 306.6$  ppm;  $CO_{2e} = 1.43$  pct;  $FID$   $HC_d = 12.1$  ppm;  $NOx_d = 0.8$  ppm;  $CO_{dm} = 15.3$  ppm;  $CO_{2d} = 0.032$  pct;  $D_{ct} = 3.598$  mi.

Then:

(i)  $V_{mix} = (0.29344)(10,485)(762 - 70)(528)/(760)(570) = 2595.0 \text{ ft}^3$  per test phase.

(ii)  $H = (43.478)(48.2)(22.225)/[762 - (22.225 \times 48.2/100)] = 62$  grains of water per pound of dry air.

(iii)  $K_H = 1/[1 - 0.0047(62 - 75)] = 0.9424$

(iv)  $CO_e = [1 - (0.01 + 0.005 \times 3.14 \times 1.43) - 0.000323(48)]/306.6 = 291.9$  ppm.

(v)  $CO_d = (1 - 0.000323(48))15.3 = 15.1$  ppm.

(vi)  $C_{CH_3OHR} =$

$(3.813 \times 10^{-2})(71)(567)[(4460)(25.2) + (360)(24.9)] / (3660)(762)(1.18)$

= 56.60 ppm.

$$(vii) DF = \frac{100 \times \frac{1}{1 + (3.14/2) + 3.76(1 + 3.14/4 - 0.6/2)}}{1.43 + [81.6 + 291.9 + (1 - 0.75)(56.60)] \times 10^{-4}}$$

$$= 8.350$$

$$(viii) C_{CH_3OH} = \frac{(3.813 \times 10^{-2})(71)(532)[(110)(25.0) + (10)(25.1)]}{(3660)(762)(1.17)} = 1.32 \text{ ppm.}$$

$$(ix) CH_3OH_{conc} = 56.60 - 1.32(1 - 1/8.350) = 55.44 \text{ ppm.}$$

$$(x) CH_3OH_{mass} = (2595.0)(37.71)(55.44/1,000,000) = 5.43 \text{ grams per test phase.}$$

$$(xi) HC_{conc} = [81.6 - (0.75)(56.60)] - [12.1 - (0.75)(1.32)](1 - 1/8.350) = 29.34 \text{ ppm.}$$

$$(xii) HC_{mass} = (2594)(16.33)(29.34/1,000,000) = 1.24 \text{ grams per test phase.}$$

$$(xiii) C_{HCHO} = (4.069 \times 10^{-2})(20)(5)(0.1429)(569)/(0.30)(762) = 1.4473 \text{ ppm.}$$

$$(xiv) C_{HCHO_d} = (4.069 \times 10^{-2})(1)(5)(0.1429)(532)/(0.31)(762) = 0.0655 \text{ ppm.}$$

$$(xv) HCHO_{conc} = 1.4473 - 0.0655(1 - 1/8.350) = 1.3896 \text{ ppm.}$$

$$(xvi) HCHO_{mass} = (2595)(35.36)(1.3896/1,000,000) = 0.1275 \text{ grams per test phase.}$$

$$(xvii) OMHCE = 1.24 + \frac{13.8756}{32.042} (5.43) + \frac{13.8756}{30.0262} (0.1275)$$

= 3.65 grams per test phase.

$$(xviii) NOx_{conc} = 11.2 - (0.8)(1 - 1/8.350) = 10.50 \text{ ppm.}$$

$$(xix) NOx_{mass} = (2595)(54.16)(10.50/1,000,000)(0.9424) = 1.390 \text{ grams per test phase.}$$

$$(xx) CO_{conc} = 291.9 - 15.1(1 - 1/8.530) = 278.69 \text{ ppm.}$$

$$(xxi) CO_{mass} = (2595.0)(32.97)(278.69/1,000,000) = 23.84 \text{ grams per test phase.}$$

$$(xxii) CO_2_{conc} = 1.43 - 0.032(1 - 1/8.350) = 1.402 \text{ percent.}$$

$$(xxiii) CO_2_{mass} = (2595.0)(51.85)(1.402/100) = 1886 \text{ grams per test phase.}$$

(2) For the stabilized portion of the cold start test assume that similar calculations resulted in the following:

(i) OMHCE = 0.55 grams per test phase.

(ii) NOx<sub>mass</sub> = 1.27 grams per test phase.

(iii) CO<sub>mass</sub> = 5.98 grams per test phase.

(iv) CO<sub>2mass</sub> = 2346 grams per test phase.

(v) D<sub>s</sub> = 3.902 miles.

(3) For the "transient" portion of the hot start test assume that similar calculations resulted in the following:

(i) OMHCE = 0.67 grams per test phase.

(ii) NOx<sub>mass</sub> = 1.38 grams per test phase.

(iii) CO<sub>mass</sub> = 5.01 grams per test phase.

(iv) CO<sub>2mass</sub> = 1758 grams per test phase.

(v) D<sub>ht</sub> = 3.598 miles.

(4) Weighted emission results:

(i) OMHCE<sub>wm</sub> = 0.43[(3.65 + 0.55)/(3.598 + 3.902)] + 0.57[(0.67 + 0.55)/(3.598 + 3.902)] = 0.334 grams per vehicle mile.

(ii) NOx<sub>wm</sub> = 0.43[(1.390 + 1.27)/(3.598 + 3.902)] + 0.57[(1.38 + 1.27)/(3.598 + 3.902)] = 0.354 grams per vehicle mile.

(iii) CO<sub>wm</sub> = 0.43[(23.84 + 5.98)/(3.598 + 3.902)] + 0.57[(5.01 + 5.98)/(3.598 + 3.902)] = 2.54 grams per vehicle mile.

(iv) CO<sub>2wm</sub> = 0.43[(1886 + 2346)/(3.598 + 3.902)] + 0.57[(1758 + 2346)/(3.598 + 3.902)] = 555 grams per vehicle mile.

73. A new section 86.608-90 is added to Subpart G, to read as follows:

**§ 86.608-90 Test procedures.**

(a) The prescribed test procedures are contained in Subpart B of this Part 86. For purposes of Selective Enforcement Audit testing, the manufacturer shall not perform any of the test procedures in Subpart B of this part relating to evaporative emission testing, except as specified in paragraph (a)(2) of this section.

(1) The Administrator may, on the basis of a written application by a manufacturer, prescribe test procedures other than those in Subpart B of this part for any motor vehicle which he determines is not susceptible to satisfactory testing using the procedures in Subpart B of this part.

(2) The following exceptions to the test procedures in Subpart B of this part are applicable to Selective Enforcement Audit testing:

(i) For mileage accumulation, the manufacturer may use test fuel meeting the specifications of mileage and service accumulation fuels of § 86.113. Otherwise, the manufacturer may use fuels other than those specified in this section only with the advance approval of the Administrator.

(ii) The manufacturer may measure the temperature of the test fuel at other than the approximate midvolume of the fuel tank, as specified in paragraph § 86.131-90(a), and may drain the test fuel from other than the lowest point of the tank, as specified in paragraph § 86.131-90(b), provided an equivalent method is used. Equivalency documentation shall be maintained by the manufacturer and shall be made

available to the Administrator upon request.

(iii) The manufacturer may perform additional preconditioning on SEA test vehicles other than the preconditioning specified in § 86.132 only if the additional preconditioning had been performed on certification test vehicles of the same configuration.

(iv) The manufacturer shall perform the heat build procedure 11 to 34 hours following vehicle preconditioning rather than according to the time period specified in paragraph § 86.133-90(a). All references in § 86.133 to an evaporative emission enclosure (SHED) and analyzing for HC during the heat build can be ignored.

(v) The manufacturer may substitute slave tires for the drive wheel tires on the vehicle as specified in paragraph § 86.135-90(e): Provided, that the slave tires are the same size.

(vi) The cold start exhaust emission test described in § 86.137 shall follow the heat build procedure described in § 86.133 by not more than one hour.

(vii) In performing exhaust sample analysis under § 86.140.

(A) When testing diesel vehicles, or methanol-fueled Otto-cycle vehicles, the manufacturer shall allow a minimum of 20 minutes warm-up for the HC analyzer, and for diesel vehicles, a minimum of two hours warm-up for the CO, CO<sub>2</sub>, and NO<sub>x</sub> analyzers. (Power is normally left on infrared and chemiluminescent analyzers. When not in use, the chopper motors of the infrared analyzers are turned off and the phototube high voltage supply to the chemiluminescent analyzers is placed in the standby position.)

(B) The manufacturer shall exercise care to prevent moisture from condensing in the sample collection bags.

(viii) The manufacturer need not comply with § 86.142, since the records required therein are provided under other provisions of Subpart G of this part.

(ix) In addition to the requirements of Subpart B of this part, the manufacturer shall prepare gasoline-fueled and methanol-fueled vehicles as follows prior to exhaust emissions testing:

(A) The manufacturer shall inspect the fuel system to insure the absence of any leaks of liquid or vapor to the atmosphere by applying a pressure of 14.5±0.5 inches of water to the fuel system, allowing the pressure to stabilize, and isolating the fuel system from the pressure source, pressure must not drop more than 2.0 inches of water in 5 minutes. If required, the manufacturer shall perform corrective action in accordance with § 86.608 and

report this action in accordance with § 86.609.

(B) When performing this pressure check, the manufacturer shall exercise care to neither purge nor load the evaporative emission control system.

(C) The manufacturer shall not modify the test vehicle's evaporative emission control system by component addition, deletion, or substitution, except to comply with paragraph (a)(2)(ii) of this section if approved in advance by the Administrator.

(b)(1) The manufacturer shall not adjust, repair, prepare, or modify the vehicles selected for testing and shall not perform any emission tests on vehicles selected for testing pursuant to the test order unless this adjustment, repair, preparation, modification, and/or tests are documented in the manufacturer's vehicle assembly and inspection procedures and are actually performed or unless these adjustments and/or tests are required or permitted under this subpart or are approved in advance by the Administrator.

(2) For 1982 and later model years the Administrator may adjust or cause to be adjusted any engine or vehicle parameter which the Administrator has determined to be subject to adjustment for new vehicle compliance testing (e.g., for certification or Selective Enforcement Audit testing) in accordance with § 86.081-22(c)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.081-22(e)(3)(ii), prior to the performance of any tests. However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a lower engine idle speed than will be possible within the physically adjustable range of the idle speed parameter on the vehicle when it has accumulated 4,000 miles, all other parameters being adjusted identically for the purpose of comparison. The Administrator, in making or specifying such adjustments, will consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use light-duty vehicles or light-duty trucks. In determining likelihood, the Administrator will consider factors such as, but not limited to, the effect of the adjustment on vehicle performance characteristics and surveillance information from similar in-use vehicles.

(c) Prior to performing exhaust emission testing on an SEA test vehicle, the manufacturer may accumulate on

each vehicle a number of miles equal to the greater of 4,000 miles, or the number of miles the manufacturer accumulated during certification on the emission-data vehicle corresponding to the configuration specified in the test order.

(1) Mileage accumulation must be performed in any manner using good engineering judgement to obtain emission results representative of normal production vehicles. This mileage accumulation must be consistent with the new vehicle break-in instructions contained in the applicable vehicle owner's manual, if any.

(2) The manufacturer shall accumulate mileage at a minimum rate of 300 miles per vehicle during each 24 hour period, unless otherwise provided by the Administrator.

(i) The first 24 hour period for mileage accumulation shall begin as soon as authorized vehicle checks, inspections and preparations are completed on each vehicle.

(ii) The minimum mileage accumulation rate does not apply on weekends or holidays.

(iii) If the manufacturer's mileage accumulation target is less than the minimum rate specified (300 miles per day), then the minimum daily accumulation rate shall be equal to the manufacturer's mileage accumulation target.

(3) Mileage accumulation shall be completed on a sufficient number of test vehicles during consecutive 24 hour periods to assure that the number of vehicles tested per day fulfills the requirements of paragraph (g) of this section.

(d) The manufacturer shall not perform any maintenance on test vehicles after selection for testing nor shall the Administrator allow deletion of any test vehicle from the test sequence, unless requested by the manufacturer and approved by the Administrator before any test vehicle maintenance or deletion.

(e) The manufacturer will be allowed 24 hours to ship test vehicles from the assembly plant or storage facility to the test facility if the test facility is not located at the plant or storage facility or in close proximity to the plant or storage facility: Except, That the Administrator may approve more time based upon a request by the manufacturer accompanied by a satisfactory justification.

(f) If a vehicle cannot complete the mileage accumulation or emission tests because of vehicle malfunction, the manufacturer may request the Administrator to authorize the repair of

that vehicle or its deletion from the test sequence.

(g) Whenever the manufacturer conducts testing pursuant to a test order issued under this subpart, the manufacturer shall notify the Administrator within one working day of receipt of the test order, which test facility will be used to comply with the test cells at that facility. If no test cells are available at the desired facility, the manufacturer must provide alternate testing capability satisfactory to the Administrator. The manufacturer shall complete emission testing on a minimum of four vehicles per 24 hour period including voided tests for each available test cell at his testing facility: Except, That the Administrator may approve a longer period based upon a request by the manufacturer accompanied by satisfactory justification.

(h) The manufacturer shall perform test vehicle selection, preparation, mileage accumulation, shipping, and testing in such a manner as to assure that the audit is performed in an expeditious manner.

(i) The manufacturer may retest any test vehicle after a fail decision has been reached in accordance with paragraph (d) of § 86.610 based on the first test on each vehicle; except, that the Administrator may approve retesting at other times during the audit based upon a request by the manufacturer accompanied by a satisfactory justification. The manufacturer may test each vehicle the same number of times. The manufacturer may accumulate additional mileage on test vehicles before conducting retests, subject to the provisions of paragraph (c) of this section.

74. The heading of Subpart I is revised, to read as follows:

**Subpart I—Emission Regulations for New Diesel Heavy-Duty Engines; Smoke Exhaust Test Procedure**

75. Section 86.884-1 of Subpart I is revised, to read as follows:

**§ 86.884-1 General applicability.**

The provisions of this subpart are applicable to new petroleum-fueled diesel heavy-duty engines beginning with the 1984 model year and methanol-fueled diesel heavy-duty engines beginning with the 1990 model year.

76. Section 86.884-5 of Subpart I is amended by revising paragraph (b), to read as follows:

**§ 86.884-5 Test procedures.**

\* \* \* \* \*

(b) The test is designed to determine the opacity of smoke in exhaust

emissions during those engine operating conditions which tend to promote smoke from diesel vehicles.

\* \* \* \* \*

77. Section 86.884-6 of Subpart I is revised, to read as follows:

**§ 86.884-6 Fuel specifications.**

The requirements of this section are set forth in § 86.1313.

78. The heading of Subpart K is revised, to read as follows:

**Subpart K—Selective Enforcement Auditing and Production Compliance Auditing of New Heavy-Duty Engines and Light-Duty Trucks**

79. Section 86.1001-84 of Subpart K is amended, to read as follows:

**§ 86.1001-84 Applicability.**

The provisions of this subpart are applicable for 1984 and later model year heavy-duty engines and light-duty trucks.

80. A new § 86.1003-90 is added to Subpart K, to read as follows:

**§ 86.1003-84 Test orders.**

(a) The Administrator shall require any testing under this subpart by means of a test order addressed to the manufacturer.

(b) The test order will be signed by the Assistant Administrator for Air and Radiation or his designee. The test order will be delivered in person by an EPA Enforcement Officer to a company representative or sent by registered mail, return receipt requested, to the manufacturer's representative who signs the Application for Certification submitted by the manufacturer pursuant to the requirements of this applicable section of Subpart A of this part. Upon receipt of a test order, the manufacturer shall comply with all of the provisions of this subpart and instructions in the test order.

(c)(1) The test order will specify the engine or vehicle configuration selected for testing, the manufacturer's vehicle or engine assembly plant or associated storage facility from which the engines or vehicles must be selected, the time and location at which engines or vehicles must be selected, and the procedure by which engines or vehicles of the specified configuration must be selected. The test order may specify the number of vehicles or engines to be selected per day.

(i) If the total production of the specified vehicle configuration is less than the number specified in the test order, the manufacturer will select the actual number of vehicles produced per day.

(ii) Heavy-duty engine manufacturers will be required to select a minimum of four engines per day unless an alternate selection procedure is approved pursuant to § 86.1007-84(a) or unless total production of the specified configuration is less than four engines per day. If total production of the specified configuration is less than four engines per day, the manufacturer will select the actual number of engines produced that day.

(2) The test order may include alternative configurations to be selected for testing in the event that engines or vehicles of the specified configuration are not available for testing because those engines or vehicles are not being manufactured during the specified time, or not being stored at the specified assembly plant or associated storage facilities.

(3) If the specified configuration is not being manufactured at a rate of at least four vehicles per day, in the case of light-duty truck manufacturers, two engines per day, in the case of heavy-duty engine manufacturers specified in paragraph (g)(1) of § 86.1008-84 or one engine per day, in the case of heavy-duty engine manufacturers specified in paragraph (g)(2) of § 86.1008-90, over the expected duration of the audit, the Assistant Administrator or his designated representative may select engines or vehicles of the alternate configuration for testing.

(4) In addition, the test order may include other directions or information essential to the administration of the required testing.

(d) A manufacturer may submit a list of engine families and the corresponding assembly plants or associated storage facilities from which the manufacturer prefers to have engines or vehicles selected for testing or response to a test order. In order that a manufacturer's preferred location be considered for inclusion in a test order for a configuration of a particular engine family, the list must be submitted prior to issuance of the test order. Notwithstanding the fact that a manufacturer has submitted the above list, the Administrator may order selection at other than a preferred location.

(e) Upon receipt of a test order, a manufacturer shall proceed in accordance with the provisions of this subpart.

(f)(1) During a given model year, the Administrator shall not issue to a manufacturer more Selective Enforcement Audit (SEA) test orders than an annual limit determined by the following:

(i) For manufacturers of heavy-duty engines, either petroleum-fueled or methanol-fueled, the number determined by dividing the projected heavy-duty engine sales bound for the United States market for that year, as made by the manufacturer in its Application for Certification, by 30,000 and rounding to the nearest whole number, unless the projected sales are less than 15,000, in which case the number is one;

(ii) For manufacturers of petroleum-fueled or methanol-fueled light-duty trucks, the number determined by dividing the projected light-duty truck sales bound for the United States market for that model year, as made by the manufacturer in its report submitted under paragraph (a)(2) of § 800.207-80 of the Automobile Fuel Economy Regulations, by 300,000 and rounding to the nearest whole number, unless the projected sales are less than 150,000, in which case the number is one.

(iii) If a manufacturer submits to EPA in writing prior to or during the model year a reliable sales projection update, that update will be used for recalculating the manufacturer's annual limit of SEA test orders.

(2) Any SEA test order for which the configuration fails in accordance with § 86.1010 or for which testing is not completed will not be counted against the annual limit.

(3) When the annual limit has been met, the Administrator may issue additional test orders for those configurations for which evidence exists indicating noncompliance. An SEA test order issued on this basis will include a statement as to the reason for its issuance.

81. A new § 86.1005-90 is added to Subpart K, to read as follows:

**§ 86.1005-90 Maintenance of records; submittal of information.**

(a) The manufacturer of any new petroleum-fueled or methanol-fueled heavy-duty engine or light-duty truck subject to any of the provisions of this subpart shall establish, maintain, and retain the following adequately organized and indexed records:

(1) *General records.* A description of all equipment used to test engines or vehicles in accordance with § 86.1008 pursuant to a test order issued under this subpart, specifically:

(i) If testing heavy-duty gasoline-fueled or methanol-fueled Otto-cycle engines, the equipment requirements specified in §§ 86.1306 and 86.1506 of this part;

(ii) If testing heavy-duty petroleum-fueled or methanol-fueled diesel engines, the equipment requirements

specified in §§ 86.1306-84, 86.884-8, and 86.884-9 of this part.

(iii) If testing gasoline-fueled or methanol-fueled Otto-cycle light-duty trucks, the equipment requirements specified in §§ 86.106 (excluding all references to evaporative and particulate emission testing) and 86.1506-84 of this part; and

(iv) If testing petroleum-fueled or methanol-fueled diesel light-duty trucks, the equipment requirements specified in §§ 86.106 (excluding all references to evaporative emission testing) and 86.1506-83 of this part.

(2) *Individual records.* These records pertain to each audit conducted pursuant to this subpart.

(i) The date, time, and location of each test;

(ii) The number of hours of service accumulated on each engine or the number of miles on the vehicle when the test began and ended;

(iii) The names of all supervisory personnel involved in the conduct of the audit;

(iv) A record and description of any repairs performed prior to and/or subsequent to approval by the Administrator, giving the date and time of the repair, the reason for it, the person authorizing it, and the names of all supervisory personnel responsible for the conduct of the repair;

(v) The date when the engine or vehicle was shipped from the assembly plant or associated storage facility and when it was received at the testing facility;

(vi) A complete record of all emission tests performed pursuant to this subpart (except tests performed by EPA directly), including all individual worksheets and/or other documentation relating to each test, or exact copies thereof, specifically

(A) If testing gasoline-fueled or methanol-fueled Otto-cycle heavy-duty engines, the record requirements specified in §§ 86.1342 and 86.1542 of this part;

(B) If testing petroleum-fueled or methanol-fueled diesel heavy-duty engines, the record requirements specified in §§ 86.1342, 86.1542, and 86.884-10;

(C) If testing gasoline-fueled or methanol-fueled Otto-cycle light-duty trucks, the record requirements specified in §§ 86.142 (excluding all references to diesel vehicles) and 86.1542; and

(D) If testing petroleum-fueled or methanol-fueled diesel light-duty trucks, the record requirements specified in § 86.142; and

(vii) A brief description of any significant audit events commencing with the test engine or vehicle selection

process, but not described by any subparagraph under paragraph (a)(2) of this section, including such extraordinary events as engine damage during shipment or vehicle accident.

(viii) A paper copy of the driver's trace for each test.

(3) The manufacturer shall record test equipment description, pursuant to paragraph (a)(1) of this section, for each test cell that can be used to perform emission testing under this subpart.

(b) The manufacturer shall retain all records required to be maintained under this subpart for a period of one (1) year after completion of all testing in response to a test order. Records may be retained as hard copy or reduced to microfilm, punch cards, etc., depending upon the manufacturer's record retention procedure: *Provided*, that in every case all information contained in the hard copy is retained.

(c) Pursuant to a request made by the Administrator, the manufacturer shall submit to him the following information with regard to engine or vehicle production:

(1) Number of engines or vehicles, by configuration and assembly plant, scheduled for production for the time period designated in the request.

(2) Number of engines or vehicles, by configuration and assembly plant, produced during the time period designated in the request which are complete form introduction into commerce.

(d) Nothing in this section limits the Administrator's discretion in requiring the manufacturer to retain additional records or submit information not specifically required by this section.

(e) The manufacturer shall address all reports, submissions, notifications, and requests for approvals made under this subpart to: Director, Manufacturers Operations Division, U.S. Environmental Protection Agency, EN-340, 401 M Street, SW., Washington, DC 20460.

82. A new § 86.1008-90 is added to Subpart K, to read as follows:

**§ 86.1008-90 Test procedures.**

(a)(1) For heavy-duty engines, the prescribed test procedure is the Federal Test Procedure as described in Subparts N, I, and P of this part.

(2) For light-duty trucks, the prescribed test procedure is the Federal Test Procedure as described in Subparts B and P of this part. The manufacturer shall not perform the evaporative emission test procedure contained in Subpart B.

(3) When testing light-duty trucks the following exceptions to the test procedures in Subpart B are applicable:



(i) For mileage accumulation, the manufacturer may use test fuel meeting the specifications of mileage and service accumulation fuels of § 86.113. Otherwise, the manufacturer may use fuels other than those specified in this section only with the advance approval of the Administrator.

(ii) The manufacturer may measure the temperature of the test fuel at other than the approximate midvolume of the fuel tank, as specified in paragraph (a) of § 86.131-90, and may drain the test fuel from other than the lowest point of the fuel tank, as specified in paragraph (b) of § 86.131-90, provided an equivalent method is used. Equivalency documentation shall be maintained by the manufacturer and shall be made available to the Administrator upon request.

(iii) The manufacturer may perform additional preconditioning on SEA test vehicles other than the preconditioning specified in § 86.132 only if the additional preconditioning had been performed on certification test vehicles of the same configuration.

(iv) The manufacturer shall perform the heat build procedure 11 to 34 hours following vehicle preconditioning rather than according to the time period specified in paragraph (a) of § 86.133. All references in § 86.133 to an evaporative emission enclosure (SHED) and analyzing for HC during the heat build can be ignored.

(v) The manufacturer may substitute slave tires for the drive wheel tires on the vehicle as specified in paragraph (e) of § 86.135-90: *Provided*, that the slave tires are the same size.

(vi) The cold start exhaust emission test described in § 86.137 shall follow the heat build procedure described in § 86.133 by not more than one hour.

(vii) In performing exhaust sample analysis under § 86.140.

(A) When testing diesel vehicles or methanol-fueled vehicles, the manufacturer shall allow a minimum of 20 minutes warm-up for the HC analyzer, and a minimum of 2 hours warm-up for the CO, CO<sub>2</sub> and NO<sub>x</sub> analyzers. (Power is normally left on infrared and chemiluminescent analyzers. When not in use, the chopper motors of the infrared analyzers are turned off and the phototube high voltage supply to the chemiluminescent analyzers is placed in the standby position.)

(B) The manufacturer shall exercise care to prevent moisture from condensing in the sample collection bags.

(viii) The manufacturer need not comply with § 86.142, since the records required therein are provided under

other provisions of Subpart K of this part.

(ix) In addition to the requirements of Subpart B of this part, the manufacturer shall prepare gasoline-fueled vehicles and methanol-fueled vehicles as follows prior to exhaust emission testing:

(A) The manufacturer shall inspect the fuel system to insure the absence of any leaks of liquid or vapor to the atmosphere by applying a pressure of 14.5+0.5 inches of water to the fuel system, allowing the pressure to stabilize, and isolating the fuel system from the pressure source. Following isolation of the fuel system, pressure must not drop more than 2.0 inches of water in five minutes. If required, the manufacturer shall perform corrective action in accordance with § 86.1008 and report this action in accordance with § 86.1009.

(B) When performing this pressure check, the manufacturer shall exercise care to neither purge nor load the evaporative emission control system.

(C) The manufacturer shall not modify the test vehicle's evaporative emission control system by component addition, deletion, or substitution, except to comply with paragraph (a)(4)(ii) of this section if approved in advance by the Administrator.

(4) The Administrator, may on the basis of a written application by a manufacturer, prescribe minor test procedure variations from those set forth in paragraphs (a)(1) and (a)(2) of this section for any heavy-duty engine.

(b)(1) The manufacturer shall not adjust, repair, prepare, or modify the engines or vehicles selected for testing and shall not perform any emission tests on engines or vehicles selected for testing and shall not perform any emission tests on engines or vehicles selected for testing pursuant to the test order unless this adjustment, repair, preparation, modification, and/or tests are documented in the manufacturer's engine or vehicle assembly and inspection procedures and are actually performed or unless these adjustments and/or test are required or permitted under this subpart or are approved in advance by the Administrator.

(2) For 1984 and later model years the Administrator may adjust or cause to be adjusted any engine parameter which the Administrator has determined to be subject to adjustment for certification, Selective Enforcement Audit, and Production Compliance Audit testing in accordance with § 86.090-22(e)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.090-22(e)(3)(ii), prior to the performance of any tests.

However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to any setting which causes a lower engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter if the manufacturer had accumulated 125 hours of service on the engine or 4,000 miles on the vehicle under paragraph (c) of this section, all other parameters being identically adjusted for the purpose of the comparison. The manufacturer may be requested to supply information to establish such an alternative minimum idle speed. The Administrator, in making or specifying these adjustments, may consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use heavy-duty engines or light-duty trucks. In determining likelihood, the Administrator may consider factors such as, but not limited to, the effect of the adjustment on engine or vehicle performance characteristics and surveillance information from similar in-use engines or vehicles.

(c) Prior to performing exhaust emission testing on an SEA test engine, the manufacturer may accumulate on each engine a number of hours of service equal to the greater of 125 hours or the number of hours the manufacturer accumulated during certification on the emission-data engine corresponding to the configuration specified in the test order. Prior to performing exhaust emission testing on an SEA test vehicle, the manufacturer may accumulate a number of miles equal to the greater of 4,000 miles or the number of miles the manufacturer accumulated during certification on the emission data vehicle corresponding to the configuration specified in the test order.

(1) Service or mileage accumulation must be performed in a manner using good engineering judgment to obtain emission results representative of normal production vehicles. This service or mileage accumulation must be consistent with the new vehicle break-in instructions contained in the applicable vehicle owner's manual, if any.

(2) The manufacturer shall accumulate service at a minimum rate of 16 hours per engine or mileage at a minimum rate of 300 miles per vehicle during each 24-hour period, unless otherwise provided by the Administrator.

(i) The first 24 hour period for service or mileage accumulation shall begin as soon as authorization checks,

inspections and preparations are completed on each engine or vehicle.

(ii) The minimum service or mileage accumulation rate does not apply on weekends or holidays.

(iii) If the manufacturer's service or mileage accumulation target is less than the minimum rate specified (16 hours or 300 miles per day), then the minimum daily accumulation rate shall be equal to the manufacturer's service or mileage accumulation target.

(3) Service or mileage accumulation shall be completed on a sufficient number of test engines or vehicles during consecutive 24-hour periods to assure that the number of engines or vehicles tested per day fulfills the requirements of paragraph (g) of this section.

(d) The manufacturer shall not perform any maintenance on test vehicles or engines after selection for testing, nor shall the Administrator allow deletion of any test vehicle or engine from the test sequence, unless requested by the manufacturer, and approved by the Administrator before any test vehicle or engine maintenance or deletion.

(e) The manufacturer shall expeditiously ship test engines or vehicles from the point of selection to the test facility. If the test facility is not located at or in close proximity to the point of selection, the manufacturer shall assure that test engines or vehicles arrive at the test facility within 24 hours of selection: *Except*, that the Administrator may approve more time based upon a request by the manufacturer accompanied by a satisfactory justification.

(f) If an engine or vehicle cannot complete the service or mileage accumulation or emission test because of a malfunction, the manufacturer may request that the Administrator authorize the repair of that engine or vehicle or its deletion from the test sequence.

(g) Whenever a manufacturer conducts testing pursuant to a test order issued under this subpart, the manufacturer shall notify the Administrator within one working day of receipt of the test order which test facility will be used to comply with the test order. If no test cells are available at a desired facility, the manufacturer must provide alternate testing capability satisfactory to the Administrator.

(1) Heavy-duty engine manufacturers with projected sales for the United States market for that year of 30,000 or greater shall complete emission testing at their facility on a minimum of two engines per 24-hour period, including each voided test and each diesel engine smoke test.

(2) Heavy-duty engine manufacturers with projected sales for the United States market for that year of less than 30,000 shall complete emission testing at their facility on a minimum of one engine per 24-hour period, including each voided test and each diesel engine smoke test.

(3) Light-duty truck manufacturers shall complete emission testing at their facility on a minimum of four engines per 24-hour period, including each voided test.

(4) The Administrator may approve a lower daily rate of conducting emission tests based upon a request by a satisfactory justification.

(h) The manufacturer shall perform test engine or vehicle selection, shipping, preparation, service or mileage accumulation, and testing in such a manner as to assure that the audit is performed in an expeditious manner.

(i) The manufacturer may retest any engines or vehicles tested during a Selective Enforcement Audit once a fail decision for the audit has been reached in accordance with § 86.1010-84(d) based on the first test on each engine or vehicle: *Except*, that the Administrator may approve retesting at other times based upon a request by the manufacturer accompanied by a satisfactory justification. The manufacturer may test each engine or vehicle a total of three times. The manufacturer shall test each engine or vehicle the same number of times. The manufacturer may accumulate additional service or mileage before conducting a retest, subject to the provisions of paragraph (c) of this section.

83. The heading of Subpart M is revised, to read as follows:

**Subpart M—Evaporative Emission Test Procedures for New Gasoline-Fueled and Methanol-Fueled Heavy-Duty Vehicles**

84. A new § 86.1201-90 is added to Subpart M, to read as follows:

**§ 86.1201-90 Applicability.**

(a) The provisions of this subpart are applicable to new gasoline-fueled and methanol-fueled heavy-duty vehicles.

(b) Provisions of this subpart apply to tests performed by both the Administrator and motor vehicle manufacturers.

(c) Test procedures and equipment other than those described in this subpart may be used by the vehicle manufacturer if shown to yield results which correlate with results yielded by those described in this subpart (with the reference driving schedule described in

§ 86.1215-85(a)) and if approved in advance by the Administrator.

85. A new § 86.1205-90 is added to Subpart M, to read as follows:

**§ 86.1205-90 Introduction; structure of subpart.**

(a) This subpart describes the equipment required and the procedures to follow in order to determine evaporative emission levels from gasoline-fueled and methanol-fueled heavy-duty vehicles.

(b) Three topics are addressed in this subpart. Sections 86.1206 through 86.1215 set forth specifications and equipment requirements; §§ 86.1216 through 86.1226 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.1227 through 86.1245.

86. A new § 86.1206-90 is added to Subpart M, to read as follows:

**§ 86.1206-90 Equipment required; overview.**

This subpart specifies procedures for testing of gasoline-fueled and methanol-fueled heavy-duty vehicles. Equipment required and specifications are as follows:

(a) *Evaporative emissions tests.* § 86.1207 specifies the necessary equipment.

(b) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for emission testing and for service accumulation are specified in § 86.1213. Analytical gases are specified in § 86.1214. Both vehicle preconditioning for the diurnal loss test and vehicle operation prior to the hot soak loss test include operation on a chassis dynamometer. The driving cycle (EPA heavy-duty vehicle urban dynamometer driving schedule) is specified in § 86.1215.

87. A new § 86.1207-90 is added to Subpart M, to read as follows:

**§ 86.1207-90 Sampling and analytical system; evaporative emissions.**

The following is a description of the components which will be used in evaporative emissions sampling systems for testing under this subpart.

(a) *Evaporative emission measurement enclosure.* The enclosure shall be readily sealable, rectangular in shape, with space for personnel access to all sides of the vehicle. When sealed, the enclosure shall be gas tight in accordance with § 86.1217. Interior surfaces must be impermeable and non-reactive to hydrocarbons and to methanol (if used for methanol-fueled vehicles). One surface should be of flexible, impermeable and non-reactive

material to allow for minor volume changes, resulting from temperature changes. Wall design should promote maximum dissipation of heat, and if artificial cooling is used, interior surface temperatures shall not be less than 66 °F (20 °C).

(b) *Evaporative emission hydrocarbon and methanol analyzers.* (1) For gasoline- and methanol-fueled vehicles a hydrocarbon analyzer utilizing the hydrogen flame ionization principle (FID) shall be used to monitor the atmosphere within the enclosure (a heated (235 ± 15 °F) (113 ± 8 °C)) flame ionization detector is required for methanol-fueled vehicles). Instrument bypass flow may be returned to the enclosure. The FID shall have a response time to 90 percent of final reading of less than 1.5 seconds, and be capable of meeting performance requirements expressed as a function of Cstd: where Cstd is the specific enclosure hydrocarbon level, in ppm, corresponding to the evaporative emission standard:

(i) Stability of the analyzer shall be better than 0.01 Cstd ppm at zero and span over a 15-minute period on all ranges used.

(ii) Repeatability of the analyzer, expressed as one standard deviation, shall be better than 0.005 Cstd ppm on all ranges used.

(2) For methanol-fueled vehicles, a methanol sampling and analyzing system is required in addition to the FID analyzer. The methanol sampling equipment shall consist of impingers for collecting the methanol sample and appropriate equipment for drawing the sample through the impingers. The analytical equipment shall consist of a gas chromatograph equipped with a flame ionization detector. (Note: For 1990 through 1994 model year methanol-fueled vehicles, a HFID, calibrated on methanol may be used in place of the HFID calibrated on propane plus the methanol impingers and associated analytical equipment.)

(c) *Evaporative emission hydrocarbon and methanol data recording system.* (1) The electrical output of the FID used for measuring hydrocarbons (or hydrocarbons plus methanol as appropriate) shall be recorded at least at the initiation and termination of each diurnal or hot soak. The recording may be by means of a strip chart potentiometric recorder, by use of an on-line computer system or other suitable means. In any case, the recording system must have operational characteristics (signal to noise ratio, speed of response, etc.) equivalent to or better than those of the signal source being recorded, and must provide a

permanent record of results. The record shall show a positive indication of the initiation and completion of each diurnal or hot soak along with the time elapsed between initiation and completion of each soak.

(2) For the methanol sample, permanent records shall be made of the following: the volumes of deionized water introduced into each impinger, the rate and time of sample collection, the volumes of each sample introduced into the gas chromatograph, the flow rate of carrier gas through the column, the column temperature, and the chromatogram of the analyzed sample.

(d) *Tank fuel heating system.* The tank fuel heating system shall consist of a heat source and a temperature controller. A typical heat source is a 2,000 W heating pad. Other sources may be used as required by circumstances. The temperature controller may be manual, such as a variable voltage transformer, or may be automated. The heating system must not cause hot spots on the tank wetted surface which could cause local overheating of the fuel. Heat must not be applied to the vapor in the tank above the liquid fuel. The temperature controller must be capable of controlling the fuel tank temperature during the diurnal soak to within ± 3 °F (± 1.7 °C) of the following equation:

$$(1) F = T_o + (0.4)t$$

$$(2) \text{ For SI units, } C = T_o + (2/9)t$$

Where:

F = Temperature in °F.  
 C = Temperature in °C.  
 t = Time since start of test in minutes.  
 T<sub>o</sub> = Initial temperature in °F (or in °C for SI units).

(e) *Temperature recording system.* Strip chart recorder(s) or an automatic data processor shall be used to record enclosure ambient and vehicle fuel tank temperature at least once every minute. The temperature recorder or data processor shall have a time accuracy of ± 15s, a time precision of ± 15s and be capable of resolving temperature to ± 0.75 °F (± 0.42 °C). The temperature recording system (recorder and sensor) shall have an accuracy of ± 3 °F (± 1.7 °C). Two ambient temperature sensors, connected to provide one average output, shall be located in the enclosure. These sensors shall be located at the approximate vertical centerline of each side wall extending 4 inches (nominally) into the enclosure at a height of 3 ± 0.5 ft (0.9 ± 0.2 m). The vehicle fuel tank temperature sensor shall be located in the fuel tank so as to measure the temperature of the prescribed test fuel at the approximate mid-volume of the fuel. Manufacturers shall arrange that vehicles furnished for testing at Federal

certification facilities be equipped with iron-constantan Type J thermocouples for measurement of fuel tank temperature.

(f) *Purge blower.* One or more portable or fixed blowers shall be used to purge the enclosure. The blowers shall have sufficient flow capacity to reduce the enclosure hydrocarbon and/or methanol concentration from the test level to the ambient level between tests. Actual flow capacity will depend upon the time available between tests.

(g) *Mixing blower.* One or more blowers or fans with a total capacity of 250 to 750 cfm per 1,000 ft<sup>3</sup> of enclosure volume shall be used to mix the contents of the enclosure during evaporative emission testing. The mixing blower(s) shall be arranged such that a uniform concentration is maintained. No portion of the air stream shall be directed towards the vehicle.

88. Section 86.1213-90 of Subpart M is amended by revising paragraphs (a), (c), and adding paragraphs (d), (e), and (f) to read as follows:

§ 86.1213-90 Fuel specifications.

(a) Gasoline having the following specifications will be used in emissions testing for gasoline-fueled vehicles.

Item	ASTM	Value
Octane, research, min.....	D2689	93
Sensitivity, min.....		7.5
Lead (organic), g/U.S. gal.....	D3237	0.050[1] (0.013)[1]
Distillation range:		
IBP, °F.....	D86	75-95 (23.9-35)
10 pct. point, °F.....	D86	120-135 (48.9-57.2)
50 pct. point, °F.....	D86	200-230 (93.3-110)
90 pct. point, °F.....	D86	300-325 (148.9-162.8)
EP, max. °F.....	D86	415 (212.8)
Sulphur, max. wt. pct.....	D1266	0.10
Phosphorous, max. g/U.S. gal.....	D3231	0.005 (0.0013)
RVP, psi.....	D323	8.7-9.2 (60.0-63.4)
Hydrocarbon composition:		
Olefins, max. pct.....	D1319	10
Aromatics, max. pct.....	D1319	35
Saturates.....	D1319	[2]

[1] Maximum.  
 [2] Remainder

(c) Methanol fuel used in evaporative emission testing and in service accumulation of methanol-fueled vehicles shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol (CH<sub>3</sub>OH) by volume.

(1) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (c) of this section.

(2) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(d) Other methanol fuels may be used for testing and service accumulation provided:

(1) They are commercially available, and

(2) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(3) Use of a fuel listed under paragraph (c)(2) of this section would have a detrimental effect on emissions or durability, and

(4) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(e) The specification range of the fuels to be used under paragraphs (b), (c), and (d) of this section shall be reported in accordance with § 86.090-21(b)(3).

(f) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.*

(1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel vehicles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (f)(2) of this section shall be reported in accordance with § 86.090-21(b)(3).

89. A new § 86.1216-90 is added to Subpart M, to read as follows:

**§ 86.1216-90 Calibrations; frequency and overview.**

(a) Calibrations shall be performed as specified in § 86.1217 through § 86.1226.

(b) At least yearly or after any maintenance which could alter

background emission levels, enclosure background emission measurements shall be performed.

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer and the methanol analyzer (see § 86.1221). Certain analyzers may require more frequent calibration depending on particular equipment and uses.

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration) the monthly calibration need not be performed (see § 86.1218).

(3) Perform a hydrocarbon and, if applicable, a methanol retention check and calibration on the evaporative emission enclosure (see § 86.1217).

90. A new § 86.1217-90 is added to Subpart M, to read as follows:

**§ 86.1217-90 Evaporative emission enclosure calibrations.**

The calibration of the evaporative emission enclosure consists of three parts: Initial and periodic determination of enclosure background emissions (hydrocarbons and methanol); initial determination of enclosure internal volume; and periodic hydrocarbon and methanol retention check and calibration. Methanol measurements may be omitted when methanol-fueled vehicles will not be tested in the evaporative enclosure.

(a) *Initial and periodic determination of enclosure background emissions.* Prior to its introduction into service, annually thereafter, and after any repair which can affect the enclosure background emissions, the enclosure shall be checked to determine that it does not contain materials which will themselves emit hydrocarbons or methanol.<sup>1</sup> Proceed as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, background methanol, temperature, and barometric pressure. These are the initial readings  $C_{HCl}$ ,  $C_{CH_3OH}$ ,  $T_i$ , and  $P_{B_i}$ .

<sup>1</sup> Note: When methanol as well as hydrocarbons are present in the evaporative enclosure, the HFID hydrocarbon concentration measurement includes the partial response of the HFID to methanol plus the hydrocarbons. Determination of the HFID response to methanol, § 86.1221, prior to its being placed in service is required for the determination of hydrocarbons.

for the enclosure background determination.

(5) Allow the enclosure to stand undisturbed without sampling for four hours.

(6) Measure the hydrocarbon and methanol concentration on the same FID. These are the final concentrations,  $C_{HCl}$  and  $C_{CH_3OH}$ . Also measure final temperature and barometric pressure.

(7) Calculate the mass change of methanol, hydrocarbons, and hydrocarbons plus methanol in the enclosure according to the equations in paragraph (d) of this section. The enclosure background emissions (hydrocarbons plus methanol) shall not be greater than 0.4g for the 4 hours.

(b) *Initial determination of enclosure internal volume.* Prior to its introduction into service the enclosure internal volume shall be determined by the following procedure.

(1) Carefully measure the internal length, width and height of the enclosure, accounting for irregularities (such as braces) and calculate the internal volume.

(2) Perform an enclosure calibration check according to paragraphs (c) (1) through (7) of this section.

(3) If the calculated mass does not agree within  $\pm 2$  percent of the injected propane mass, then corrective action is required.

(c) *Hydrocarbon and methanol retention check and calibration.* The hydrocarbon and methanol retention check provides a check upon the calculated volume and also measures the leak rate. Prior to its introduction into service and at least monthly thereafter the enclosure leak rate shall be determined as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, background methanol, temperature, and barometric pressure. These are the initial readings  $C_{HCl}$ ,  $C_{CH_3OH}$ ,  $T_i$  and  $P_{B_i}$  for the enclosure calibration.

(5) Inject into the enclosure a known quantity of pure propane (4g is a convenient quantity) and a known quantity of pure methanol (4g is a convenient quantity) in gaseous form; i.e., at a temperature of at least 150-155 °F (65-68 °C). The propane and methanol may be measured by volume flow or by mass measurement. The method used to measure the propane, and the methanol if appropriate, shall

have an accuracy and precision of ±0.5 percent of the measured value.

(6) After a minimum of 5 minutes of mixing, analyze the enclosure atmosphere for hydrocarbon and methanol content, also record temperature and pressure. These measurements are the final readings for the enclosure calibration as well as the initial readings for the retention check.

(7) To verify the enclosure calibration, calculate the mass of propane and the mass of methanol using the measurements taken in steps (4) and (8).

See paragraph (d) of this section. This quantity must be within ±2 percent of that measured in step 5 above.

(8) Allow the enclosure to remain sealed for a minimum of 4 hours, analyze the enclosure atmosphere for hydrocarbon and methanol content; record temperature and barometric pressure. These are the final readings for the hydrocarbon and methanol retention check.

(9) Calculate, using the equations in paragraph (d) of this section and the readings taken in step (8), the

hydrocarbon and methanol mass. It may not differ by more than ±4 percent of the value in step (6).

(d) *Calculations.* (1) The calculation of net methanol and hydrocarbon mass change is used to determine enclosure background and leak rate. It is also used to check the enclosure volume measurements. The methanol mass change is calculated from the initial and final methanol samples, temperature and pressure according to the following equation:

$$M_{CH_3OH} = \left( \frac{V \times C_{MR}}{A_{MR}} \right) \times \left[ \left( \frac{T_{Ef}}{V_{Ef} \times T_{SHEDf}} \right) [(A_{MS1f} \times AV_{1f}) + (A_{MS2f} \times AV_{2f})] - \left( \frac{T_{Ei}}{V_{Ei} \times T_{SHEDI}} \right) [(A_{MS1i} \times AV_{1i}) + (A_{MS2i} \times AV_{2i})] \right]$$

Where:

- (i)  $M_{CH_3OH}$  = Methanol mass change,  $\mu\text{g}$ .
- (ii)  $V$  = Enclosure volume,  $\text{ft}^3$ , as measured in paragraph (b)(1) of this section.
- (iii)  $C_{MR}$  = Concentration of methanol in standard sample for calibration of GC,  $\mu\text{g}/\text{ml}$ .
- (iv)  $A_{MR}$  = GC peak area of standard sample.

- (v)  $T_E$  = Temperature of sample withdrawn,  $^{\circ}\text{R}$ .
- (vi)  $V_E$  = Volume of sample withdrawn,  $\text{ft}^3$ .
- (vii)  $P_B$  = Barometric pressure at time of sampling, in. Hg.
- (viii)  $A_{MS}$  = GC peak area of test sample.
- (ix)  $AV$  = Volume of absorbing reagent in impinger.
- (x)  $i$  = Initial sample.

- (xi)  $f$  = Final sample.
- (xii)  $1$  = First impinger.
- (xiii)  $2$  = Second impinger.

(2) The hydrocarbon mass change is calculated from the initial and final FID readings of hydrocarbon concentration, methanol concentration with FID response to methanol, temperature, and pressure according to the following equation:

$$M_{HC} = kV \times 10^{-4} \frac{(C_{HCf} - rC_{CH_3OHf}) \times P_{Bf}}{T_f} - \frac{(C_{HCi} - rC_{CH_3OHi}) \times P_{Bi}}{T_i}$$

Where:

- (i)  $M_{HC}$  = Hydrocarbon mass change, g.
- (iv)  $V$  = Enclosure volume,  $\text{ft}^3$  ( $\text{m}^3$ ), as measured in paragraph (b)(1) of this section.

- (ii)  $C_{HC}$  = FID hydrocarbon concentration as ppm carbon including FID response to methanol in the sample.

- (iii)  $C_{CH_3OH}$  = Methanol concentration as ppm carbon

$$= \frac{1.501 \times 10^{-3} C_{MR} \times T_E}{A_{MR} \times P_B \times V_E} [(A_{S1} \times AV_1) + (A_{S2} \times AV_2)]$$

- (v)  $r$  = FID response factor to methanol.
- (vi)  $P_B$  = Barometric pressure, in. Hg (kPa).

- (vii)  $T$  = Enclosure ambient temperature,  $^{\circ}\text{R}$  ( $^{\circ}\text{K}$ ).
- (viii)  $i$  = Indicates initial reading.
- (ix)  $f$  = Indicates final reading.

(x) (A)  $k=3.05$

(B) *For SI units*,  $k=17.60$

Note: Hydrocarbon concentration is stated in ppm carbon, that is, ppm propane  $\times 3$ . Expressions in parentheses are for SI units.

91. A new § 86.1221-90 is added to Subpart M, to read as follows:

**§ 86.1221-90 Hydrocarbon analyzer calibration.**

The FID hydrocarbon analyzer shall receive the following initial and periodic calibrations.

(a) *Initial and periodic optimization of detector response.* Prior to its introduction into service and at least annually thereafter, the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. (The HFID used with methanol-fueled vehicle shall be operated at  $235^{\circ} \pm 15^{\circ} \text{F}$  ( $113^{\circ} \pm 8^{\circ} \text{C}$ .) Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow the manufacturer's instructions or good engineering practice for instrument startup and basic operating adjustment using the appropriate FID fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the

analyzer a propane in air mixture with a propane concentration equal to approximately 90 percent of the most common operating range.

(3) Select an operating FID fuel flow rate that will give near maximum response and least variation in response with minor fuel flow variations.

(4) To determine the optimum air flow, use the FID fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, record them for future reference.

(b) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter the FID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges, and, if applicable, the methanol response factor shall be determined (paragraph (c) of this section). Use the same flow rate as when analyzing sample.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each normally used operating range with propane in air calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range

calibrated, if the deviation from a least squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(c) *FID response factor to methanol.* When the FID analyzer is to be used for the analysis of hydrocarbon samples containing methanol, the methanol response factor of the analyzer shall be established. The methanol response factor shall be determined at several concentrations in the range of concentrations in the exhaust sample.

(1) The bag sample of methanol for analysis in the FID shall be prepared using the apparatus shown in Figure M90-1. A known volume of methanol is injected, using a microliter syringe, into the heated mixing zone ( $250^{\circ} \text{F}$  ( $121^{\circ} \text{C}$ )) of the apparatus. The methanol is vaporized and swept into the sample bag with a known volume of zero grade air measured by a dry gas meter.

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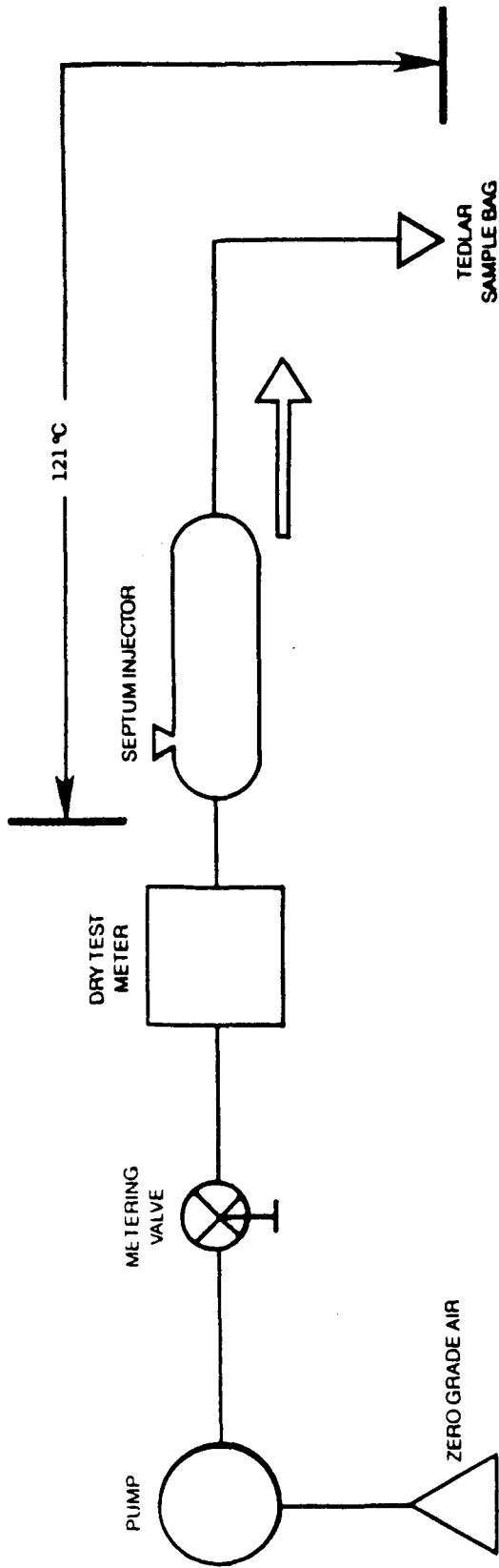


FIGURE M90-1 APPARATUS FOR PREPARATION OF FID METHANOL RESPONSE CALIBRATION MIX

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(2) The bag sample is analyzed using the FID.

(3) The FID response factor,  $r$ , is calculated as follows:

$$r = \text{FID}_{\text{ppm}} / \text{SAM}_{\text{ppm}}$$

Where:

- (i)  $r$  = FID response factor.
- (ii)  $\text{FID}_{\text{ppm}}$  = FID reading in ppmC.
- (iii)  $\text{SAM}_{\text{ppm}}$  = methanol concentration in the sample bag in ppmC.

$$= \frac{0.02406 \times \text{Fuel injected} \times \text{Fuel density}}{\text{Air volume} \times \text{Mol. Wt. CH}_3\text{OH}}$$

Where:

- (iv) 0.02406 = Volume of one mole at 29.92 in Hg and 68°F,  $\text{m}^3$ .
- (v) Fuel injected = Volume of methanol injected, ml.
- (vi) Fuel density = Density of methanol, 0.7914 g/ml.
- (vii) Air volume = Volume of zero grade air,  $\text{m}^3$ .
- (viii) Mol. Wt.  $\text{CH}_3\text{OH}$  = 32.04.

(d) The gas chromatograph used in the analysis of methanol samples shall be calibrated at least monthly following manufacturers' recommended procedures (certain equipment may require more frequent calibration based on use and good engineering judgment).

92. A new § 86.1227-90 is added to Subpart M, to read as follows:

**§ 86.1227-90 Test procedures; overview.**

(a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions. Vehicles are tested only for evaporative emissions.

(b) The evaporative emission test (gasoline-fueled and methanol-fueled vehicles) is designed to determine hydrocarbon and/or methanol evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving and hot soaks during engine-off periods. It is associated with a series of events representative of heavy-duty vehicle operation, which result in hydrocarbon and/or methanol vapor losses. The test procedure is designed to measure:

- (1) Diurnal breathing losses resulting from daily temperature changes, measured by the enclosure technique;
- (2) Running losses from suspected sources (if indicated by engineering analysis or vehicle inspection) resulting from a simulated trip on a chassis dynamometer, measured by carbon traps; and
- (3) Hot soak losses which result when

the vehicle is parked and the hot engine is turned off, measured by the enclosure technique.

93. A new § 86.1231-90 is added to Subpart M, to read as follows:

**§ 86.1231-90 Vehicle preparation.**

(a) Prepare the fuel tank(s) for recording the temperature of the prescribed test fuel at the approximate mid-volume of the fuel when the tank is 40 percent full.

(b) Provide additional fittings and adapters, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

(c)(1) Any vapor storage device which absorbs HC vapors and/or  $\text{CH}_3\text{OH}$  vapors and subsequently releases them to the engine induction system during vehicle operation shall be subjected to a minimum of 30 load-purge cycles or the equivalent thereof (4,000 miles or more of actual in-use vehicle service accumulation shall be considered equivalent). One load-purge cycle shall be accomplished by conducting one of the following procedures:

(i) *Vehicle Procedure.* Park a fully-warm vehicle (a vehicle that has been driven for at least 15 minutes) for a time period of at least 3 hours. Fill the fuel tank(s) to the prescribed "tank fuel volume" with specified test fuel (§ 86.1213) at room temperature. Then drive the vehicle through at least one cycle of the HDV reference (transient) urban dynamometer driving schedule.

(ii) *Laboratory Procedure.* Flow vapors (gasoline or methanol, as appropriate) into a pre-purged vapor storage device until at least 10 percent of the input HC or  $\text{CH}_3\text{OH}$  mass flow rate is passing through the device. Purge the device with a volume of air which is at least as great as, and which has a temperature no higher than that which would be drawn through the device if it were installed on the test vehicle and the vehicle was operated according to the HDV reference (transient) urban dynamometer driving schedule. The vapor flow rate, the method used to generate the vapors, the air flow rate, and the air temperature shall be recorded. If pre-blended gas is used, then the composition and characteristics of the gas shall be recorded.

(2) Ten load-purge cycles accumulated immediately prior to testing shall be conducted according to the method in paragraph (c)(1)(i) of this section. The preceding 20 cycles (minimum) shall be

conducted according to either of the methods in paragraph (c)(1) (i) or (ii) of this section.

94. A new § 86.1232-90 is added to Subpart M, to read as follows:

**§ 86.1232-90 Vehicle preconditioning.**

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be drained through the provided fuel tank(s) drain(s) and filled to the prescribed "tank fuel volume" with the specified test fuel, § 86.1213. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one HDV urban dynamometer driving schedule (see § 86.1215). A test vehicle may not be used to set dynamometer horsepower.

(3) The Administrator may choose to conduct additional preconditioning to insure that the evaporative emissions control system is stabilized. The additional preconditioning shall consist of an initial one hour minimum soak and one, two or three driving cycles of the dynamometer driving schedule, as described in paragraph (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer for the soak period which follows each driving cycle.

(b) After completion of preconditioning the vehicle shall be driven off the dynamometer and parked. The engine shall be turned off within five minutes of completion of preconditioning. The vehicle may be pushed to its parking location after its engine has been turned off.

95. A new § 86.1233-90 is added to Subpart M, to read as follows:

**§ 86.1233-90 Diurnal breathing loss test.**

(a) Following vehicle preparation and vehicle preconditioning procedures described in §§ 86.1231 and 86.1232, the diurnal test shall start not less than 10 or more than 35 hours after the end of the preconditioning procedure. The start of vehicle operation shall follow the end of the diurnal test within one hour.



(b) The evaporative emissions enclosure shall be purged for several minutes immediately prior to the test.

**Note:** If at any time the concentration of hydrocarbons, or of methanol, or of hydrocarbons and methanol exceeds 15,000 ppm C the enclosure should be immediately purged. This concentration provides a 4:1 safety factor against the lean flammability limit.

(c) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(d) Impingers charged with known volumes of pure deionized water shall be placed in the methanol sampling system (methanol-fueled vehicles only).

(e) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(f) For vehicles with multiple tanks, the largest tank shall be designated as the primary tank and shall be heated in accordance with the procedures described in paragraph (m) of this section. All other tanks shall be designated as auxiliary tanks and shall undergo a similar heat build such that the fuel temperature shall be within 3 °F (1.6 °C) of the primary tank.

(g) Immediately prior to the diurnal breathing loss test, the fuel tank(s) of the prepared vehicle shall be drained and recharged with the specified test fuel as defined in § 86.1213 to the prescribed "tank fuel volume", as defined in § 86.078-2. The temperature of the fuel prior to its delivery to the fuel tank shall be between 45 °F and 60 °F (7.2 °C and 16 °C). The fuel tank cap(s) is not installed until the diurnal heat build begins.

(h) The test vehicle, with the engine shut off, shall be moved into the evaporative emission enclosure, the test vehicle windows and any storage compartments shall be opened, the fuel tank temperature sensor shall be connected to the temperature recording system, and, if required, the heat source shall be properly positioned with respect to the fuel tank(s) and/or connected to the temperature controller.

(i) The temperature recording system shall be started.

(j) The fuel may be artificially heated to the starting diurnal temperature, 60 °F ± 2 °F (16 °C ± 1.1 °C).

(k) When the fuel temperature recording system reaches at least 58 °F (14 °C), immediately:

- (1) Install fuel tank cap(s).
- (2) Turn off purge blowers, if not already off at this time.
- (3) Close and seal enclosure doors.

(l) When the fuel temperature recording system reaches 60 °F ± 2 °F (16 °C ± 1.1 °C) immediately:

(1) Analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration,  $C_{HCl}$  (see § 86.1243).

(2) Simultaneously with initiation of the hydrocarbon analysis, initiate collection of the methanol sample by drawing a sample from the enclosure through the sampling system for four minutes. This is the initial methanol measurement from which methanol concentration  $C_{CH_3OH}$  and mass are calculated. Remove impingers and replace with freshly charged clean impingers which will be used to collect the final methanol sample.

(3) Record barometric pressure reading. This is the initial (time=0 minutes) barometric pressure,  $P_{bi}$  (see § 86.1243).

(4) Record enclosure ambient temperature. This is the initial (time=0 minutes) enclosure ambient temperature,  $T_i$  (see § 86.1243).

(5) Start diurnal heat build and record time. This commences the 60 ± 2 minute test period.

(m) The fuel shall be heated in such a way that its temperature change conforms to the following function to within ± 3 °F (± 1.6 °C):

$$(1) F = T_o + 0.4t$$

$$(2) \text{ For SI units, } C = T_o + (2/9)t$$

Where:

F = fuel temperature, °F.

C = fuel temperature, °C.

t = heating time, minutes.

$T_o$  = initial temperature in °F (or in °C for SI units).

After 60 ± 2 minutes of heating, the fuel temperature rise shall be 240 ± 1 °F (13.30 ± 0.5 °C).

(n) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the diurnal test.

(o)(1) The end of the diurnal breathing loss test occurs 60 ± 2 minutes after the heat build begins (paragraph (k)(4) of this section). Analyze the enclosure atmosphere for hydrocarbon and record. This is the final (time=60 minutes) hydrocarbon concentration,  $C_{HCl}$  (see § 86.1234). The time (or elapsed time) of this analysis shall be recorded.

(2) Simultaneously with the start of the hydrocarbon analysis, initiate collection of the methanol sample. Sample for four minutes. This is the final methanol sample.

(3) *Alternate method for methanol sampling.* Since sample times of longer than four minutes may be necessary in order to collect an adequate and representative sample of methanol at the end of a test (when SHED concentrations are usually increasing rapidly), it may be necessary to rapidly

collect the methanol sample in a bag and then bubble the bag sample through the impingers at the specified flow rate. The time elapsed between collection of the bag sample and flowing through the impingers should be minimized in order to prevent any losses. This alternative must be adopted if the four minute sample period is inadequate to collect a sample of sufficient concentration to allow accurate GC analysis.

(4) Record barometric pressure reading. This is the final (time=60 minutes) barometric pressure,  $P_{bf}$  (see § 86.1243).

(5) Record enclosure ambient temperature. This is the final (time=60 minutes) enclosure ambient temperature,  $T_f$  (see § 86.1243).

(p) The heat source shall be turned off and the enclosure doors unsealed.

(q) The heat source shall be moved away from the vehicle, if required, and/or disconnected from the temperature controller, the fuel tank temperature sensor shall be disconnected from the temperature recording system, and the test vehicle windows and any storage compartments may be closed. The vehicle shall be either driven or pushed out of the evaporative emission enclosure.

96. A new § 86.1238-90 is added to Subpart M, to read as follows:

#### § 86.1238-90 Hot soak test.

The one-hour hot-soak evaporative emission test shall be conducted immediately following one cycle of the dynamometer driving schedule.

(a) Prior to the completion of the dynamometer cycle, the evaporative emission enclosure shall be purged for several minutes.

(b) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(c) Fresh impingers shall be installed in the methanol sample collection system immediately prior to the start of the test, if applicable.

(d) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(e) Upon completion of the dynamometer run the exhaust tube shall be disconnected from the vehicle tailpipe(s), the cooling fan(s) shall be moved, and the vehicle shall be disconnected from the dynamometer and driven at minimum throttle to the vehicle entrance of the enclosure.

(f) The vehicle's engine must be stopped before any part of the vehicle enters the enclosure. The vehicle may be pushed or coasted into the enclosure.

(g) The test vehicle windows and any storage compartments shall be opened, if not already open.

(h) The temperature recording system shall be started and the time of engine shut off shall be noted on the evaporative emissions hydrocarbon data recording system.

(i) The enclosure doors shall be closed and sealed within four minutes of engine shutdown and within ten minutes after the end of the dynamometer run.

(j) The  $60 \pm 0.5$  minute hot soak begins when the enclosure doors are sealed. The enclosure atmosphere shall be analyzed and recorded. This is the initial (time=0 minutes) hydrocarbon concentration,  $C_{HCl}$ , for use in calculating evaporative losses (see § 86.1243). The "zero" time methanol sample shall be collected starting at the same time as the hydrocarbon analysis is started. Sampling shall continue for four minutes.

(k) The test vehicle shall be permitted to soak for a period of one hour in the enclosure.

(l) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(m) Fresh impingers shall be installed in the methanol collection system immediately prior to the end of the test, if applicable.

(n) At the end of the  $60 \pm 0.5$  minute test period, the enclosure atmosphere shall again be analyzed (as described in § 86.1238-90(j) and the time recorded. This is the final (time=60 minutes) hydrocarbon concentration,  $C_{HCl}$  and the final methanol level for use in calculating evaporative losses (see § 86.1243). This operation completes the evaporative emission measurement procedure.

(o) *Alternate method for methanol sampling.* Since sample times of longer than four minutes may be necessary in order to collect an adequate and representative sample of methanol at the end of a test (when SHED

concentrations are usually increasing rapidly), it may be necessary to rapidly collect the methanol sample in a bag and then bubble the bag sample through the impingers at the specified flow rate. The time elapsed between collection of the bag sample and flowing through the impingers should be minimized in order to prevent any losses. This alternative must be adopted if the four minute sample period is inadequate to collect a sample of sufficient concentration to allow accurate GC analysis.

97. A new § 86.1242-90 is added to Subpart M, to read as follows:

**§ 86.1242-90 Records required.**

The following information shall be recorded with respect to each test:

- (a) Test number.
- (b) System or device tested (brief description).
- (c) Date and time of day for each part of the test schedule.
- (d) Instrument operator.
- (e) Driver or operator.
- (f) Vehicle: ID number; Manufacturer; Model Year; Engine family; Evaporative emissions family; Basic engine description (including displacement, number of cylinders, and catalyst usage); Engine maximum power rating and rated speed; Fuel system (including number of carburetors, number of carburetor barrels, fuel injection type, fuel tank(s) capacity and location, and number and size (volume and working capacity)) of evaporative control canisters; Engine code; Gross vehicle weight rating; Actual curb weight at zero miles; Actual road load at 50 mph; Transmission configuration; Axle ratio; Vehicle line; Odometer reading; Idle rpm; and Drive wheel tire pressure, as applicable.

(g) Indicated road load power absorption at 50 mph (80 km/hr) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be

used, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning, gain, serial number, detector number and range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span and enclosure gas sample traces.

(j) Test cell barometric pressure and ambient temperature.

**Note:** A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within  $\pm 0.1$  percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures as prescribed.

(l) *For methanol-fueled vehicles:* (1) Volume of sample passed through the methanol sampling system and the volume of deionized water in each impinger.

(2) The methanol concentration in the reference sample and the peak area from the GC analysis of the reference sample.

(3) The peak area of the GC analyses of the test samples (methanol).

98. A new § 86.1243-90 is added to Subpart M, to read as follows:

**§ 86.1243-90 Calculations; evaporative emissions.**

(a) The calculation of the net hydrocarbon, methanol and hydrocarbon plus methanol mass change in the enclosure is used to determine the diurnal and hot soak mass emissions. The mass changes are calculated from initial and final hydrocarbon and methanol concentrations in ppm carbon, initial and final enclosure ambient temperatures, initial and final barometric pressures, and net enclosure volume using the following equations:

(1) For methanol:

$$M_{CH_3OH} = \left( \frac{V_n \times C_{MR}}{A_{MR}} \right) \times \left[ \left( \frac{T_{Ef}}{(V_E \times T_{SHEDf})} \right) \times [(A_{MS1f} \times AV_{1f}) + (A_{MS2f} \times AV_{2f})] - \left( \frac{T_{Ei}}{(V_E \times T_{SHEDi})} \right) \times [(A_{MS1i} \times AV_{1i}) + (A_{MS2i} \times AV_{2i})] \right]$$

Where:

- (i)  $M_{CH_3OH}$  = Methanol mass change,  $\mu\text{g}$ .
- (ii)  $V_n$  = Net enclosure volume,  $\text{ft}^3$ , as determined by subtracting  $50 \text{ ft}^3$  ( $1.42 \text{ m}^3$ ) (volume of vehicle with trunk and windows open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal  $50 \text{ ft}^3$ ) with advance approval by the Administrator: *Provided*, the measured volume is

- determined and used for all vehicles tested by that manufacturer.
- (iii)  $C_{MR}$  = Concentration of methanol in standard sample for calibration of GC,  $\mu\text{g}/\text{ml}$ .
- (iv)  $A_{MR}$  = GC peak area of standard sample.
- (v)  $T_E$  = Temperature of sample withdrawn,  $^{\circ}\text{R}$ .
- (vi)  $V_E$  = Volume of sample withdrawn,  $\text{ft}^3$ .
- (vii)  $T_{SHED}$  = Temperature of SHED,  $^{\circ}\text{R}$ .

- (viii)  $P_B$  = Barometric pressure at time of sampling, in. Hg.
- (ix)  $A_{MS}$  = GC peak area of sample.
- (x)  $AV$  = Volume of absorbing reagent in impinger.
- (xi)  $i$  = Initial sample.
- (xii)  $f$  = Final sample.
- (xiii)  $1$  = First impinger.
- (xiv)  $2$  = Second impinger.
- (2) For hydrocarbons:

$$M_{MR} = (kV_n \times 10^{-4}) \left[ \frac{(C_{HC1} - rC_{CH_3OH})P_B}{T_1} - \frac{(C_{MC1} - rC_{CH_3OH})P_B}{T_1} \right]$$

Where:

- (i)  $M_{HC}$  = Hydrocarbon mass change, g.

- (ii)  $C_{HC}$  = FID hydrocarbon concentration as ppm carbon including FID response to methanol in the sample.

- (iii)  $C_{CH_3OH}$  = Methanol concentration as ppm carbon.

$$\left( \frac{1.501 \times 10^{-3} C_{MR} \times T}{A_{MR} \times P_B \times V_E} \right) \times \{(A_{S1} \times AV_1) + (A_{S2} \times AV_2)\}$$

- (iv)  $V_n$  = Net enclosure volume  $\text{ft}^3$  ( $\text{m}^3$ ), as determined by subtracting  $50 \text{ ft}^3$  ( $1.42 \text{ m}^3$ ) (volume of vehicle with trunk and windows open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal  $50 \text{ ft}^3$ ) with advance approval by the Administrator: *Provided*, the measured volume is

- determined and used for all vehicles tested by that manufacturer.
- (v)  $r$  = FID response factor to methanol.
- (vi)  $P_B$  = Barometric pressure, in Hg (kPa).
- (vii)  $T$  = Enclosure temperature,  $^{\circ}\text{R}$  ( $^{\circ}\text{K}$ ).
- (viii)  $i$  = initial reading.
- (ix)  $f$  = final reading.

- (x)  $1$  = First impinger.
- (xi)  $2$  = Second impinger.
- (xii) (A)  $k = 0.208 (12 + H/C)$ .
- (B) For SI units,  $k = 1.2 (12 + H/C)$ .

Where:

- (xiii)  $H/C$  = hydrogen carbon ratio.
- (A)  $H/C = 2.33$  for diurnal emissions.
- (B)  $H/C = 2.2$  for hot soak emissions.
- (3) For total evaporative emissions: Total Evaporative Emissions =

$$(M_{HC} + \frac{14.3594 \times 10^6}{32.042} M_{CH_3OH}) + (M_{HC} + \frac{14.2284}{32.042} \times 10^6 M_{CH_3OH}) \text{g.}$$

(b) The final reported results shall be computed by summing the individual evaporative emission results determined for the diurnal breathing-loss test, running-loss test and the hot-soak test.

99. The heading of Subpart N is revised, to read as follows:

**Subpart N—Emission Regulations for New Otto-Cycle and Diesel Heavy-Duty Engines; Gaseous and Particulate Exhaust Test Procedures**

100. A new § 86.1301-90 is added to Subpart N to read as follows:

**§ 86.1301-90 Scope; applicability.**

This subpart contains gaseous emission test procedures for Otto-cycle and diesel heavy-duty engines, and

particulate emission test procedures for diesel heavy-duty engines. It applies to 1990 and later model years.

101. A new § 86.1304-90 is added to Subpart N, to read as follows:

**§ 86.1304-90 Section numbering; construction.**

(a) The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is effective. A section remains effective until superseded.

*Example:* Section § 86.1311-84 applies to the 1984 and subsequent model years until superceded. If a section § 86.1311-88 is promulgated it would take effect beginning

with the 1988 model year; § 86.1311-84 would apply to model years 1984 through 1987.

(b) A section reference without a model year suffix refers to the section applicable for the appropriate model year.

(c) Unless indicated, all provisions in this subpart apply to both Otto-cycle and diesel heavy-duty engines.

102. A new § 86.1305-90 is added to Subpart N, to read as follows:

**§ 86.1305-90 Introduction; structure of subpart.**

(a) This subpart describes the equipment required and the procedures to follow in order to perform exhaust emission tests on Otto-cycle and diesel heavy-duty engines. Subpart A sets forth

the testing requirements and test intervals necessary to comply with EPA certification procedures.

(b) Four topics are addressed in this subpart. Sections 86.1306 through 86.1315 set forth specifications and equipment requirements; §§ 86.1316 through 86.1326 discuss calibration methods and frequency; test procedures are listed in §§ 86.1327 through 86.1341; calculation formula are found in § 86.1342; and data requirements are found in § 86.1344.

103. A new § 86.1306-90 is added to Subpart N, to read as follows:

**§ 86.1306-90 Equipment required and specifications; overview.**

(a) *Exhaust emission tests.* All engines subject to this subpart are tested for exhaust emissions. Petroleum-fueled and methanol-fueled, Otto-cycle and diesel engines are tested identically with the exception of the systems used to measure hydrocarbon, nitrogen oxide, methanol, formaldehyde, and particulate; petroleum-fueled diesel engines require a heated, continuous hydrocarbon detector and a continuous nitrogen oxide detector (§ 86.1310); methanol-fueled engines require a heated hydrocarbon detector, a methanol detector and a formaldehyde detector; gasoline-fueled and methanol-fueled Otto-cycle engines are not tested for particulate emissions (§ 86.1309). Necessary equipment and specifications appear in §§ 86.1308, 86.1309, 86.1310 and 86.1311.

(b) *Fuel, analytical gas, and engine cycle specifications.* Fuel specifications

for exhaust emission testing are specified in § 86.1313. Analytical gases are specified in § 86.1314. The EPA heavy-duty transient engines cycles for use in exhaust testing are described in § 86.1333 and specified in Appendix I to this part.

104. A new § 86.1309-90 is added to Subpart N, to read as follows:

**§ 86.1309-90 Exhaust gas sampling system; gasoline-fueled and methanol-fueled Otto-cycle engines.**

(a)(1) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of gaseous emissions in the exhaust of either gasoline-fueled or methanol-fueled Otto-cycle engines. In the CVS concept of measuring mass emissions, two conditions must be satisfied; the total volume of the mixture of exhaust and dilution air must be measured, and a continuously proportioned volume of sample must be collected for analysis. Mass emissions are determined from the sample concentration and total flow over the test period.

(2) *Engine exhaust to CVS duct.* For methanol-fueled engines, cooling of the exhaust gases in the duct connecting the engine exhaust to the dilution tunnel shall be minimized. This may be accomplished by:

(i) Using a duct of unrestricted length maintained at  $235 \pm 15$  °F ( $113 \pm 8$  °C). (Heating and possibly cooling capabilities as required,) or

(ii) Using a short up to 12 feet long, duct constructed of smooth wall pipe

with a minimum of flexible sections, maintained at  $235 \pm 15$  °F ( $113 \pm 8$  °C) prior to the test and during periods when the engine is not in operation (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded), or

(iii) Using a smooth wall duct less than five feet long with no required heating, or

(iv) Omitting the duct and performing the exhaust gas dilution function at the engine exhaust manifold or immediately after exhaust aftertreatment systems.

(3) *Positive displacement pump.* The Positive Displacement Pump Constant Volume Sampler (PDP-CVS), Figure N90-1 satisfies the first condition by metering at a constant temperature and pressure through the pump. The total volume is measured by counting the revolutions made by the calibrated positive displacement pump. The proportional samples for the bag sample and for methanol fueled vehicles, the methanol sample (Figure N90-2) and the formaldehyde sample (Figure N90-3), are achieved by sampling at a constant flow rate. For methanol-fueled engines, the sample lines for the methanol and formaldehyde samples are heated to  $235 \pm 15$  °F ( $113 \pm 8$  °C). Note: For 1990 through 1994 model year methanol-fueled engines, methanol and formaldehyde sampling may be omitted provided the bag sample (hydrocarbons and methanol) is analyzed using a HFID calibrated with methanol.

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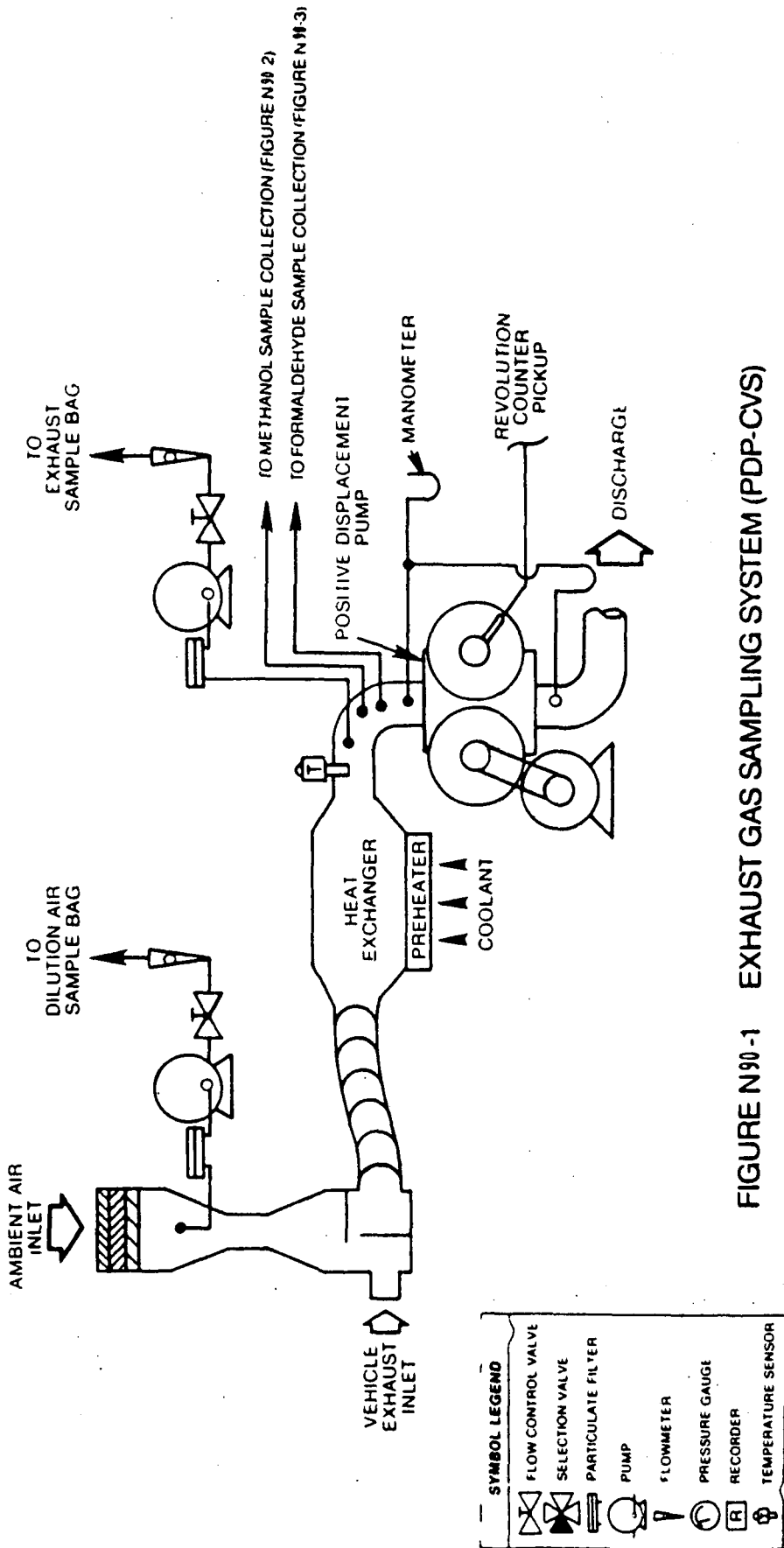


FIGURE N90-1 EXHAUST GAS SAMPLING SYSTEM (PDP-CVS)

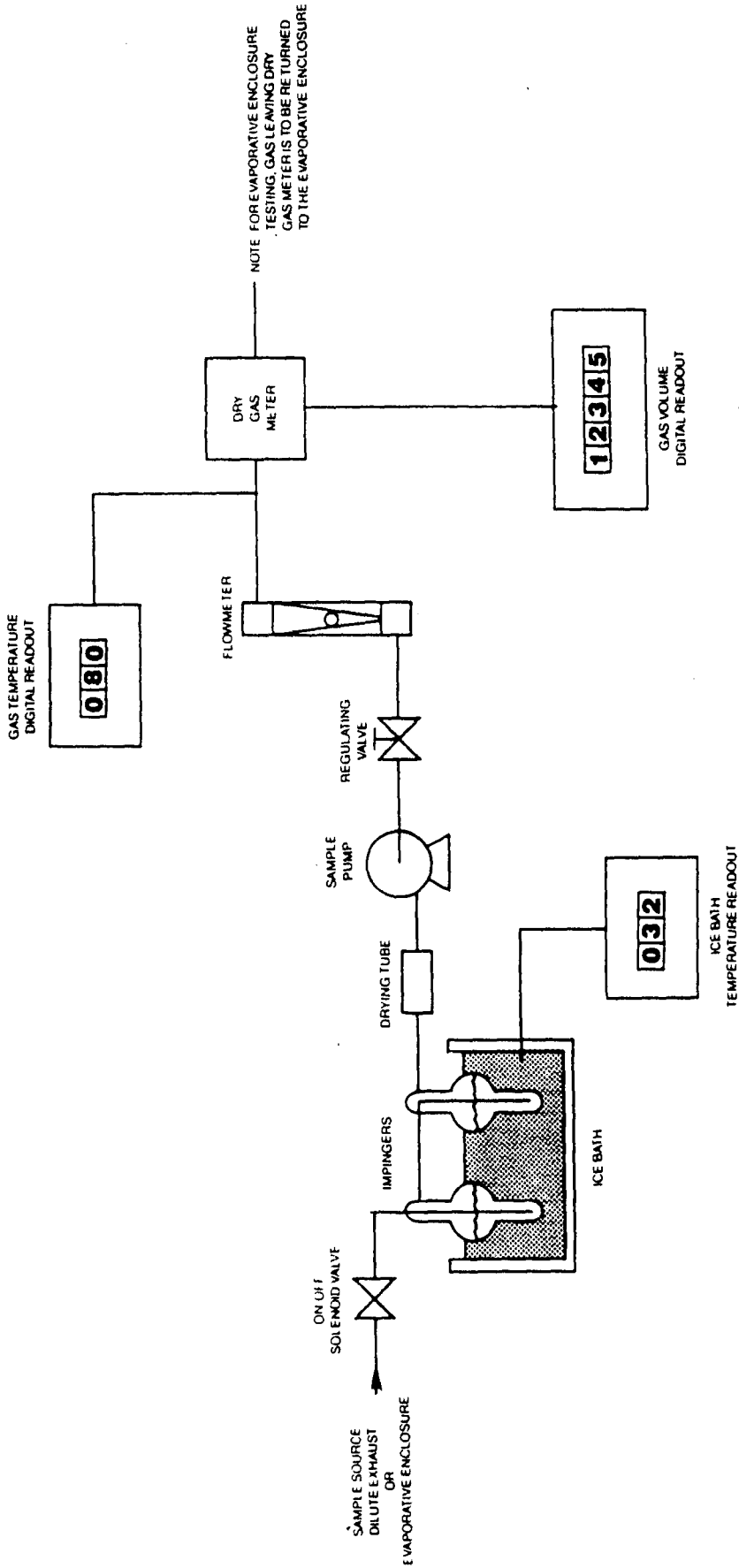


FIGURE N90-2 METHANOL SAMPLE COLLECTION FLOW SCHEMATIC

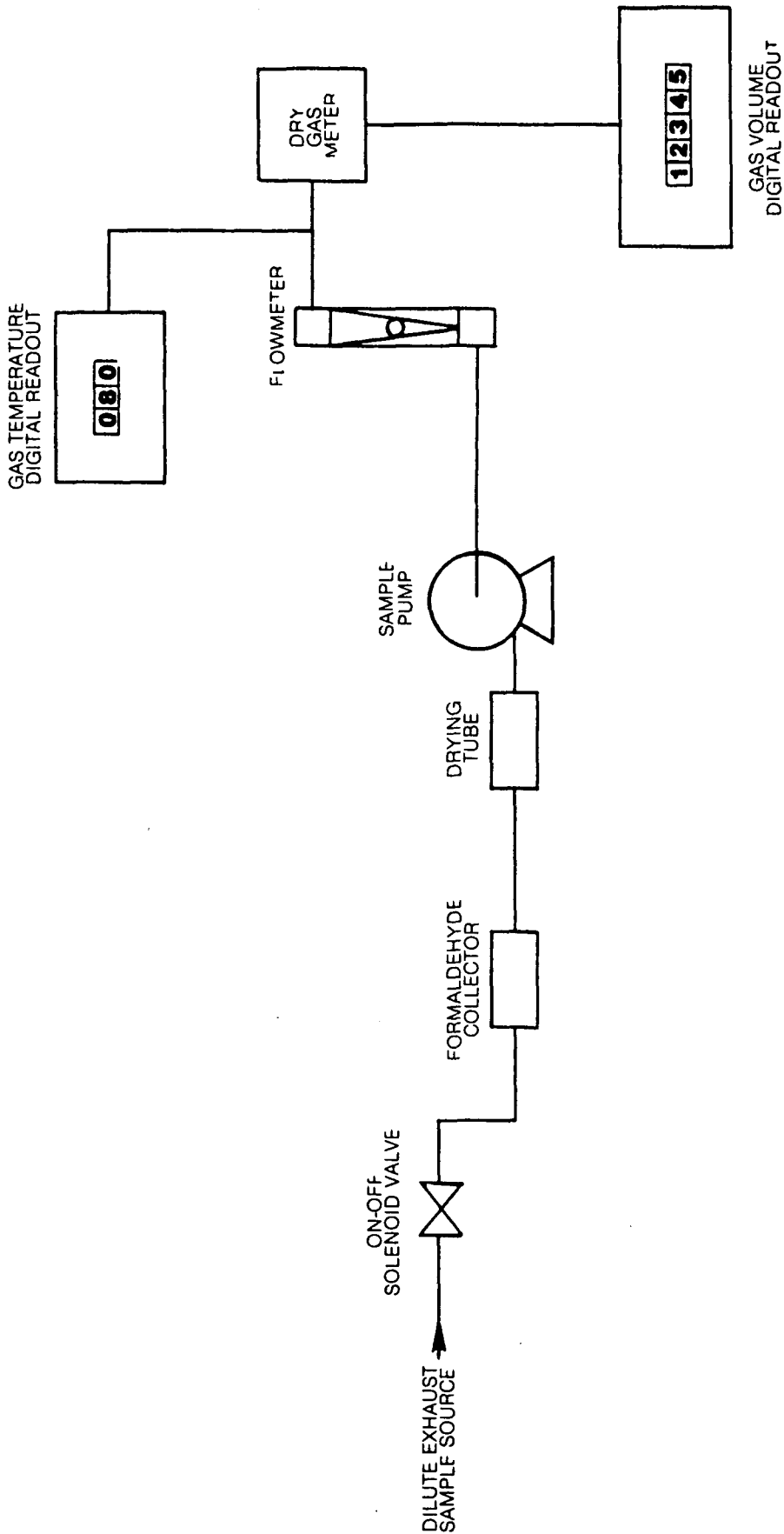


FIGURE N90-3 FORMALDEHYDE SAMPLE COLLECTION FLOW SCHEMATIC

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(4) *Critical flow venturi.* The operation of the Critical Flow Venturi Constant Volume Sampler (CFV-CVS), Figure N90-4 is based upon the principles of fluid dynamics associated with critical flow. The CFV system is commonly called a constant volume system (CVS) even though the flow varies. It would be more proper to call the critical flow venturi (CFV) system a constant proportion sampling system since proportional sampling throughout

temperature excursions is maintained by use of a small CFVs in the sample lines. For methanol-fueled engines, one line supplies sample for the bag sample, another line supplies sample for the methanol sample, and a third line supplies sample for the formaldehyde sample. The lines for the methanol and formaldehyde samples are heated to  $235^{\circ}\pm 15^{\circ}\text{F}$  ( $113^{\circ}\pm 8^{\circ}\text{C}$ ) with care being taken to ensure that the CFVs of the sample probes are not heated.

**Note:** For 1990 through 1994 model year methanol-fueled engines, methanol and formaldehyde sampling may be omitted provided the bag sample (hydrocarbons and methanol) is analyzed using a HFID calibrated with methanol. The variable mixture flow rate is maintained at choked flow, which is inversely proportional to the square root of the gas temperature, and is computed continuously. Since the pressure and temperature are the same at all venturi inlets, the sample volume is proportional to the total volume.

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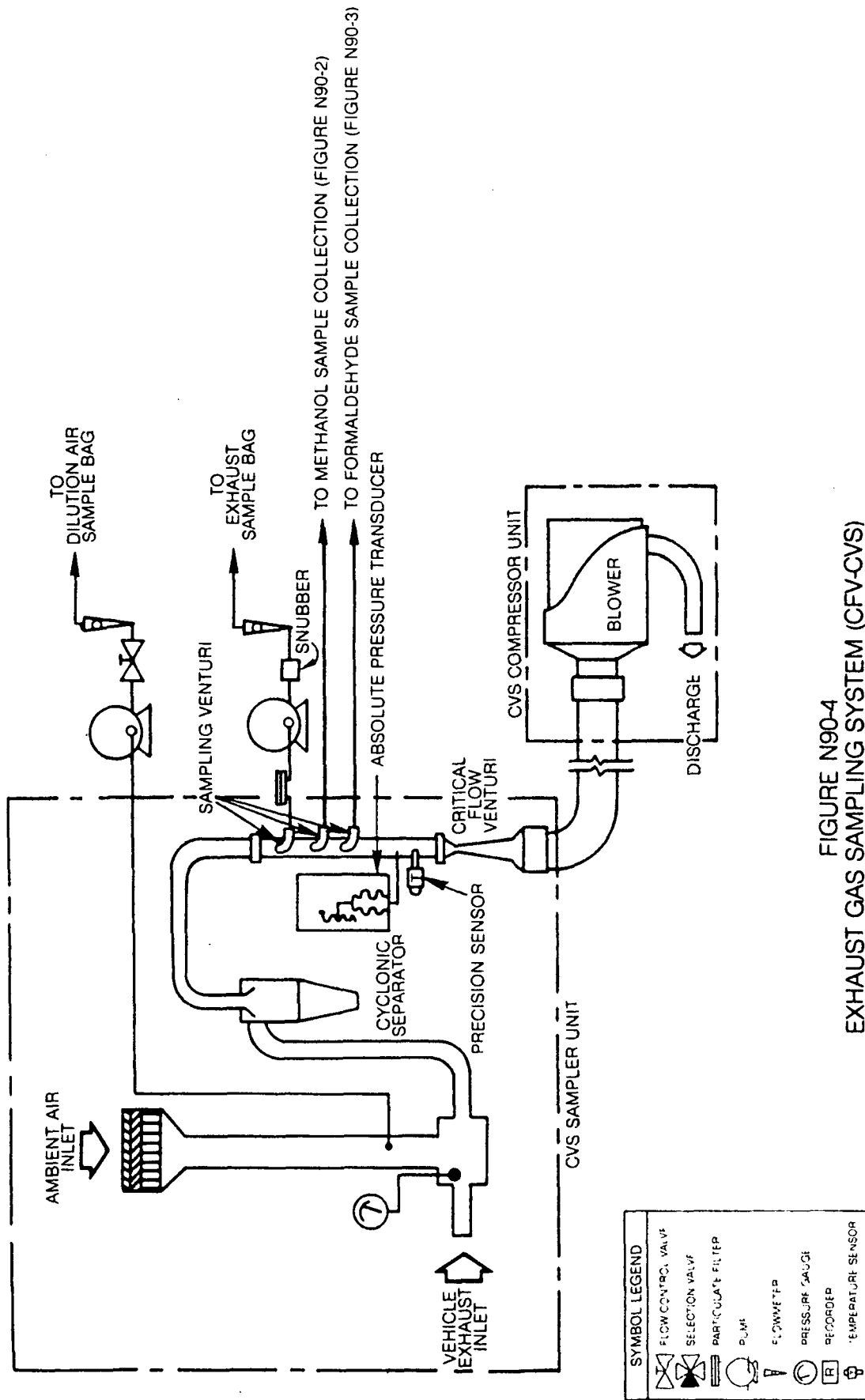


FIGURE N90-4  
EXHAUST GAS SAMPLING SYSTEM (CFV-CVS)

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(5) *Other systems.* Other sampling and/or analytical systems including the systems described in § 86.1310 for petroleum-fueled diesel engines may be used if shown to yield equivalent results, and if approved in advance by the Administrator.

(6) Since various configurations can produce equivalent results, exact conformance with these drawings is not required. Additional components such as instruments, valves, solenoids, pumps and switches may be used to provide additional information and coordinate the functions of the component systems. Other components such as snubbers, which are not needed to maintain accuracy on some systems, may be excluded if their exclusion is based upon good engineering judgment.

(b) *Component description, PDP-CVS.* The PDP CVS, Figure N90-1, consists of a dilution air filter and mixing assembly, heat exchanger, positive displacement pump, sampling systems (see Figure N90-2 for methanol sampling system and Figure N90-3 for formaldehyde sampling system) including sampling lines which are heated to  $235^{\circ} \pm 15^{\circ} \text{F}$  ( $113^{\circ} \pm 8^{\circ} \text{C}$ ) in the case of the methanol-fueled engine (heating of the sample lines may be omitted, provided the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of sample due to cooling and resulting condensation in the sample lines), and associated valves, pressure and temperature sensors. The PDP-CVS shall conform to the following requirements:

(1) Exhaust system backpressure must not be artificially lowered by the CVS or dilution air inlet system. Measurements to verify this should be made in the raw exhaust immediately upstream of the inlet to the CVS. (For diesel engines, this measurement should be made immediately upstream of the backpressure set device.) This verification requires the continuous measurement and comparison of raw exhaust static pressure observed during a transient cycle, both with and without the operating CVS. Static pressure measured with the operating CVS system shall remain within  $\pm 5$  inches of water (1.2 kPa) of the static pressure measured without connection to the CVS, at identical moments in the test cycle. (Sampling systems capable of maintaining the static pressure to within  $\pm 1$  inch of water (0.25 kPa) will be used by the Administrator if a written request substantiates the need for this closer tolerance.) This requirement is essentially a design specification for the CVS/dilution air inlet system, and

should be performed as often as good engineering practice dictates (*e.g.*, after installation of an uncharacterized CVS, addition of an unknown inlet restriction on the dilution air, *etc.*).

(2) The gas mixture temperature, measured at a point immediately ahead of the positive displacement pump and after the heat exchanger, shall be maintained within  $\pm 10^{\circ} \text{F}$  ( $\pm 5.6^{\circ} \text{C}$ ) of the average operating temperature observed during the test. (The average operating temperature may be estimated from the average operating temperature from similar tests.) The temperature measuring system (sensors and readout) shall have an accuracy and precision of  $\pm 3.4^{\circ} \text{F}$  ( $1.9^{\circ} \text{C}$ ).

(3) The pressure gauges shall have an accuracy and precision of  $\pm 3$  mm Hg (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to eliminate water condensation in the system. This is especially critical in the case of methanol-fueled engines; see "Calculation of Emissions and Fuel Economy When Using Alternative Fuels," EPA 460/3-83-009.

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow. A single dilution air sample, covering the total test period, may be collected for determination of formaldehyde background (methanol-fueled engines).

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient capacity so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the PDP.

(c) *Component description, CFV.* The CFV sample system, Figure N90-4, consists of a dilution air filter (optional) and mixing assembly, cyclone particulate separator (optional), unheated sampling venturies for the bag, methanol and formaldehyde samples from methanol-fueled engines, heated sample lines ( $235^{\circ} \pm 15^{\circ} \text{F}$  ( $113^{\circ} \pm 8^{\circ} \text{C}$ )) for the methanol and formaldehyde samples from methanol-fueled vehicles (heating of the sample lines may be omitted provided, the methanol and formaldehyde sample collection systems are close coupled to the probes thereby preventing loss of samples due to cooling and resulting condensation in the sample lines), critical flow venturi, and assorted valves, and pressure and temperature sensors. The CFV sample system shall conform to the following requirements:

(1) Static pressure variations in the raw exhaust shall conform to the specifications detailed in paragraph (b)(1) of this section.

(2) The temperature measuring system (sensors and readout) shall have an accuracy and precision of  $\pm 3.4^{\circ} \text{F}$  ( $\pm 1.9^{\circ} \text{C}$ ). The temperature measuring system used in a CVS without a heat exchanger shall have a response time of 1.50 seconds to 62.5 percent of a temperature change (as measured in hot silicone oil). There is no response time requirement for a CVS equipped with a heat exchanger.

(3) The pressure measuring system (sensors and readout) shall have an accuracy and precision of  $\pm 3$  mm Hg (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to prevent water condensation in the system. This is especially important with methanol-fueled engines; see "Calculation of Emissions and Fuel Economy When Using Alternative Fuels," EPA 460/3-83-009.

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow. A single dilution air sample covering the total test period may be collected for determination of formaldehyde background (methanol-fueled engines).

(6) The methanol sample collection system and the formaldehyde sample collection system shall each be of sufficient capacity so as to collect samples of adequate size for analysis without significant impact on the volume of dilute exhaust passing through the CFV.

105. A new § 86.1310-90 is added to Subpart N, to read as follows:

**§ 86.1310-90 Exhaust gas sampling and analytical system; petroleum-fueled and methanol-fueled diesel engines.**

(a) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of both gaseous and particulate emissions in the exhaust of petroleum-fueled and methanol-fueled heavy-duty diesel engines. This system utilizes the CVS concept (described in § 86.1309) of measuring mass emissions of HC,  $\text{CH}_3\text{OH}$  and  $\text{HCHO}$  from methanol-fueled engines and  $\text{CO}$ ,  $\text{CO}_2$ , and particulate from both fuel types. A continuously integrated system is required for HC (petroleum-fueled engines) and  $\text{NO}_x$  (petroleum-fueled and methanol-fueled engines) measurement, and is allowed for all  $\text{CO}$  and  $\text{CO}_2$  measurements plus  $\text{CH}_3\text{OH}$ ,  $\text{HCHO}$ , and HC from methanol-fueled engines. The

mass of gaseous emissions is determined from the sample concentration and total flow over the test period. The mass of particulate emissions is determined from a proportional mass sample collected on a filter and from the sample flow and total flow over the test period. As an option, the measurement of total fuel mass consumed over a cycle may be substituted for the exhaust measurement of CO<sub>2</sub>. General requirements are as follows:

(1) This sampling system requires the use of a PDP-CVS and a heat exchanger, or a CFV-CVS with either a heat exchanger or electronic flow compensation. Figure N90-5 is a schematic drawing of the PDP system. Figure N90-6 is a schematic drawing of the CFV system.

**BILLING CODE 6560-50-M**

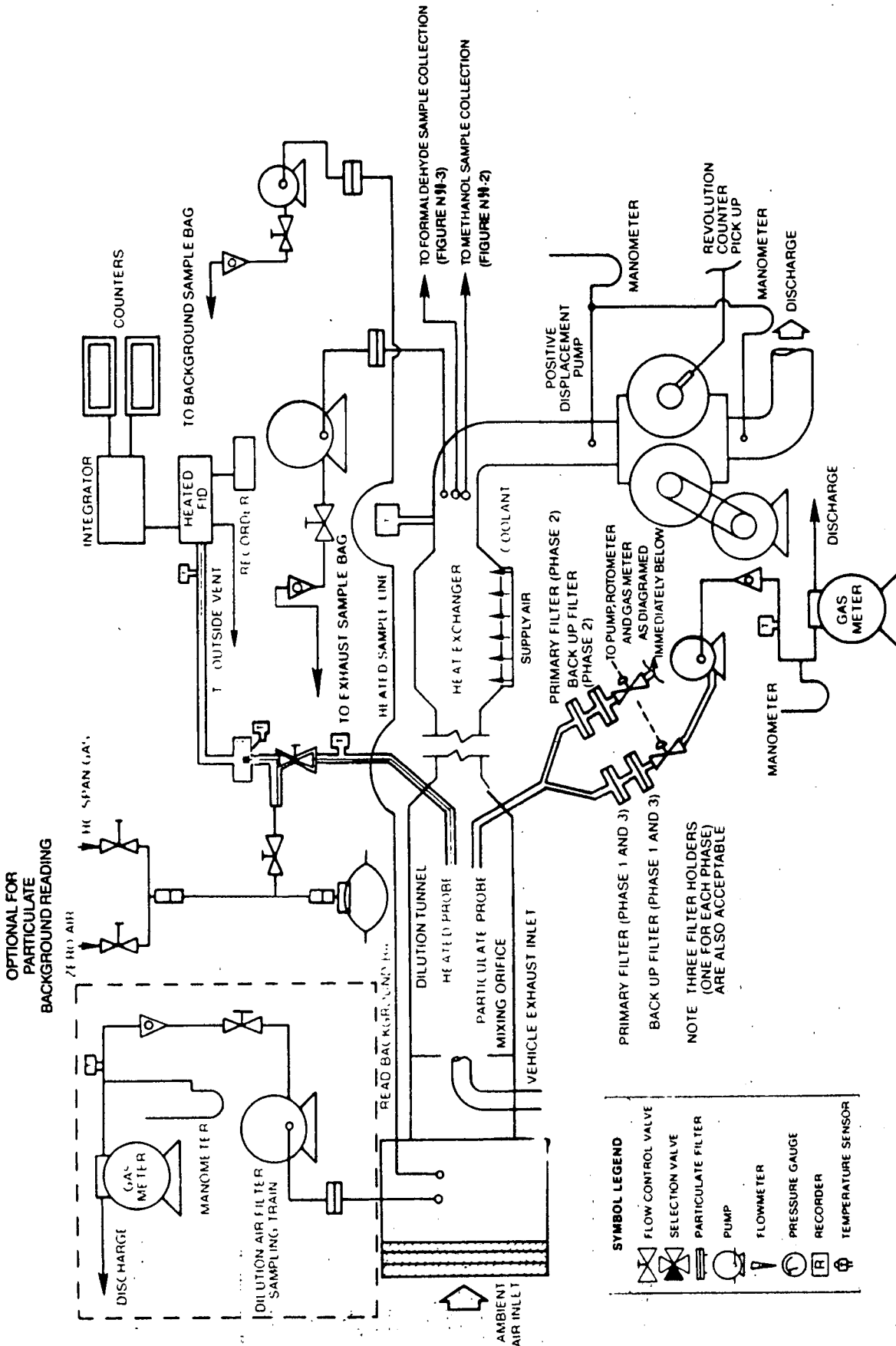
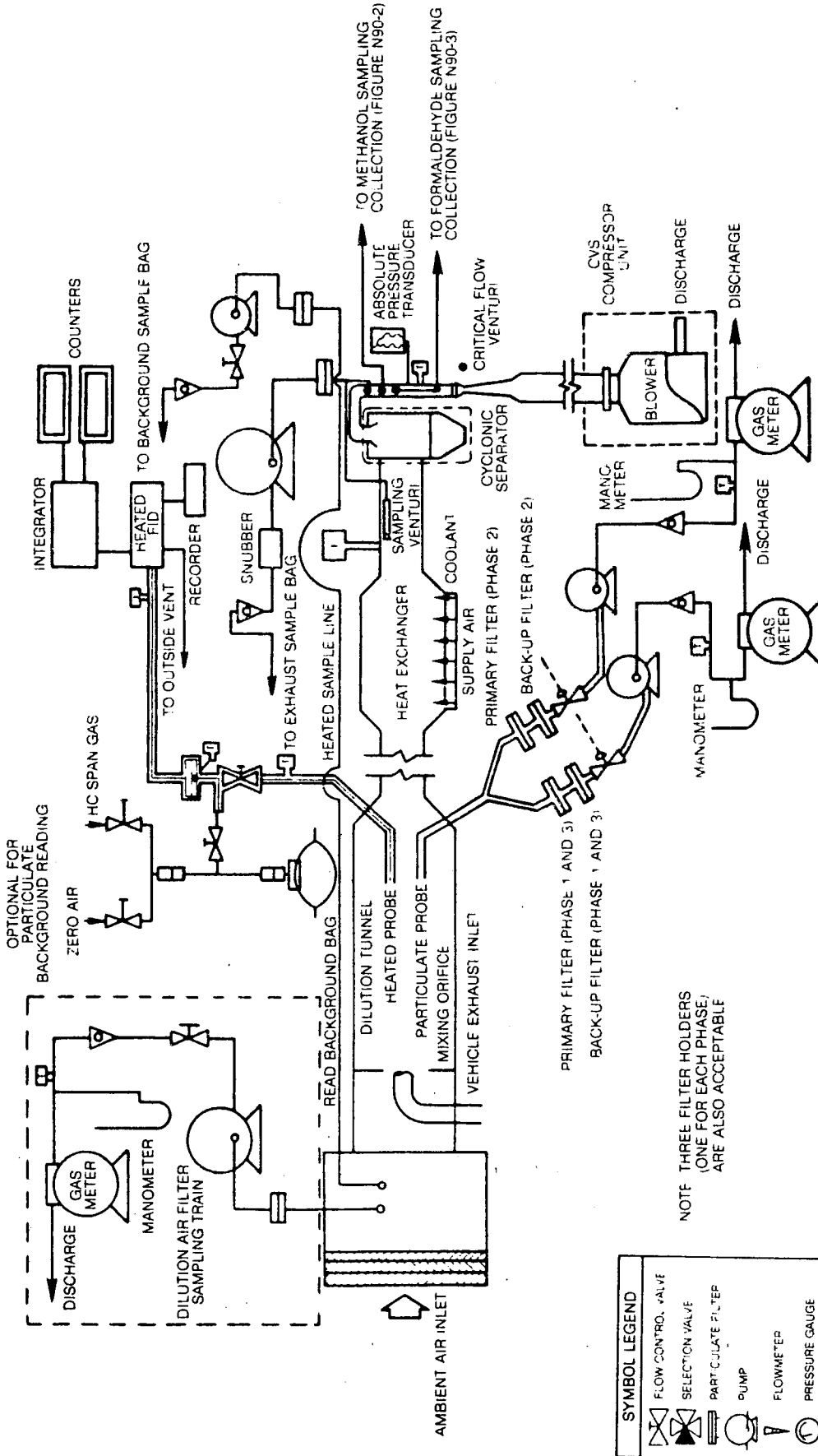


FIGURE N90-5 GASEOUS AND PARTICULATE EMISSIONS SAMPLING SYSTEM (PDP-CVS)



**SYMBOL LEGEND**

	FLOW CONTROL VALVE
	SELECTION VALVE
	PARTICULATE FILTER
	PUMP
	FLOWMETER
	PRESSURE GAUGE
	RECORDER
	TEMPERATURE SENSOR

FIGURE N90-6  
GASEOUS AND PARTICULATE EMISSIONS SAMPLING SYSTEM (CFV-CVS)

(2) The HC analytical system for petroleum-fueled diesel engines requires a heated flame ionization detector (HFID) and heated sample system ( $375 \pm 20$  °F ( $191 \pm 11$  °C)).

(i) The HFID sample must be taken directly from the diluted exhaust stream through a heated probe and integrated continuously over the test cycle. Unless compensation for varying flow is made, the HFID must be used with a constant flow system to ensure a representative sample.

(ii) The heated probe shall be located in the primary dilution tunnel and far enough downstream of the mixing chamber to ensure a uniform sample distribution across the CVS duct at the point of sampling.

(3) Methanol-fueled engines require the use of a heated flame ionization detector (HFID) ( $235 \pm 15$  °F ( $113 \pm 8$  °C)) for hydrocarbon analysis. With a heated FID, the hydrocarbon analysis can be made on the bag sample and the methanol and formaldehyde analyses are performed on the samples collected for these purposes (Figures N90-2 and N90-3).

Note: For 1990 through 1994 model year methanol-fueled engines, methanol and formaldehyde sampling may be omitted provided the hydrocarbon plus methanol analyses are performed using a FID calibrated on methanol.

(4) For methanol-fueled engines, cooling of the exhaust gases in the duct connecting the engine exhaust to the dilution tunnel shall be minimized. This may be accomplished by:

(i) Using a duct of unrestricted length maintained at  $235 \pm 15$  °F ( $113 \pm 8$  °C) with heating and possibly cooling capabilities as required, or;

(ii) Using a short duct up to 12 feet long, constructed of smooth wall pipe with a minimum of flexible sections, maintained at  $235 \pm 15$  °F ( $113 \pm 8$  °C) prior to the test and during periods when the engine is not in operation (insulation may remain in place and/or heating may occur during testing provided maximum temperature is not exceeded), or;

(iii) Using a smooth wall duct less than five feet long with no required heating, or;

(iv) Omitting the duct and performing the exhaust gas dilution function at the engine exhaust manifold or immediately after exhaust aftertreatment systems.

(5) Heated sample lines are required for the methanol and formaldehyde samples for methanol-fueled engines (care must be taken to prevent heating of the sample probes unless compensation for varying flow rate is made). The sample collection lines shall be heated to  $235 \pm 15$  °F ( $113 \pm 8$  °C).

(6) The CO and CO<sub>2</sub> analytical system requires:

(i) Bag sampling (§ 86.1309) and analytical (§ 86.1311) capabilities, as shown in Figure N90-5 (or Figure N90-6), or

(ii) Continuously integrated measurement of diluted CO and CO<sub>2</sub> meeting the minimum requirements and technical specifications contained in paragraph (b)(5) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a representative sample.

(7) The NO<sub>x</sub> analytical system requires a continuously integrated measurement of diluted NO<sub>x</sub> meeting the minimum requirements and technical specifications contained in paragraph (b)(5) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a representative sample.

(8) The mass of particulate in the exhaust is determined via filtration. The particulate sampling system requires dilution of the exhaust in either one or two steps to a temperature never greater than 125 °F (51.7 °C) at the primary sample filter. A backup filter provides a confirmation of sufficient filtering efficiency.

(9) Since various configurations can produce equivalent results, exact conformance with these drawings is not required. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems. Other components, such as snubbers, which are not needed to maintain accuracy on some systems, may be excluded if their exclusion is based upon good engineering judgment.

(10) Other sampling and/or analytical systems may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(b) *Component description.* The components necessary for exhaust sampling shall meet the following requirements:

(1) *Exhaust dilution system.* The PDP-CVS shall conform to all of the requirements listed for the exhaust gas PDP-CVS in § 86.1309(b). The CFV-CVS shall conform to all of the requirements listed for the exhaust gas CFV-CVS in § 86.1309(c). In addition, the CVS must conform to the following requirements:

(i) The flow capacity of the CVS must be sufficient to maintain the diluted exhaust stream at or below the temperatures required for the measurement of particulate and hydrocarbon emissions noted below and at, or below, the temperatures where condensation of water in the exhaust

gases could occur. This may be achieved by either of the following two methods:

(A) *Single-dilution method.* The flow capacity of the CVS must be sufficient to maintain the diluted exhaust stream at a temperature of 125 °F (51.7 °C) or less, at the sampling zone in the primary dilution tunnel and as required to prevent condensation at any point in the dilution tunnel. Direct sampling of the particulate material may then take place (Figure N90-5).

(B) *Double-dilution method.* The flow capacity of the CVS must be sufficient to maintain the diluted exhaust stream in the primary dilution tunnel at a temperature of 375 °F (191 °C) (250 °F (121 °C) for methanol fueled engines) or less at the sampling zone and as required to prevent condensation at any point in the dilution tunnel. Gaseous emission samples may be taken directly from this sampling point. An exhaust sample must then be taken at this point to be diluted a second time for use in determining particulate emissions. The secondary dilution system must provide sufficient secondary dilution air to maintain the double-diluted exhaust stream at a temperature of 125 °F (51.7 °C) or less immediately before the primary particulate filter in the secondary dilution tunnel.

(ii) For the CFV-CVS, either a heat exchanger or electronic flow compensation (which also includes the particulate sample flows) is required (see Figure N90-6).

(iii) For the CFV-CVS when a heat exchanger is used, the gas mixture temperature, measured at a point immediately ahead of the critical flow venturi, shall be within  $\pm 20$  °F ( $\pm 11$  °C) of the average operating temperature observed during the test with the simultaneous requirement that condensation does not occur. The temperature measuring system (sensors and readout) shall have an accuracy and precision of  $\pm 3.4$  °F (1.9 °C). For systems utilizing a flow compensator to maintain proportional flow, the requirement for maintaining constant temperature is not necessary.

(iv) The primary dilution air and secondary dilution air (if applicable):

(A) Shall have a temperature of  $77 \pm 9$  °F ( $25 \pm 5$  °C). For the first 10 seconds this specification is  $77 \pm 20$  °F ( $25 \pm 11$  °C).

(B) May be filtered at the dilution air inlet.

(C) May be sampled to determine background particulate levels, which can then be subtracted from the values measured in the detailed exhaust stream.

(2) [Reserved]

(3) *Continuous HC measurement system.* (i) The continuous HC sample system (as shown in Figure N90-7 or N90-8) uses an "overflow" zero and span system. In this type of system, excess zero or span gas spills out of the probe when zero and span checks of the analyzer are made. The "overflow" system may also be used to calibrate the HC analyzer per § 86.1321(b), although this is not required.

**BILLING CODE 6560-50-M**

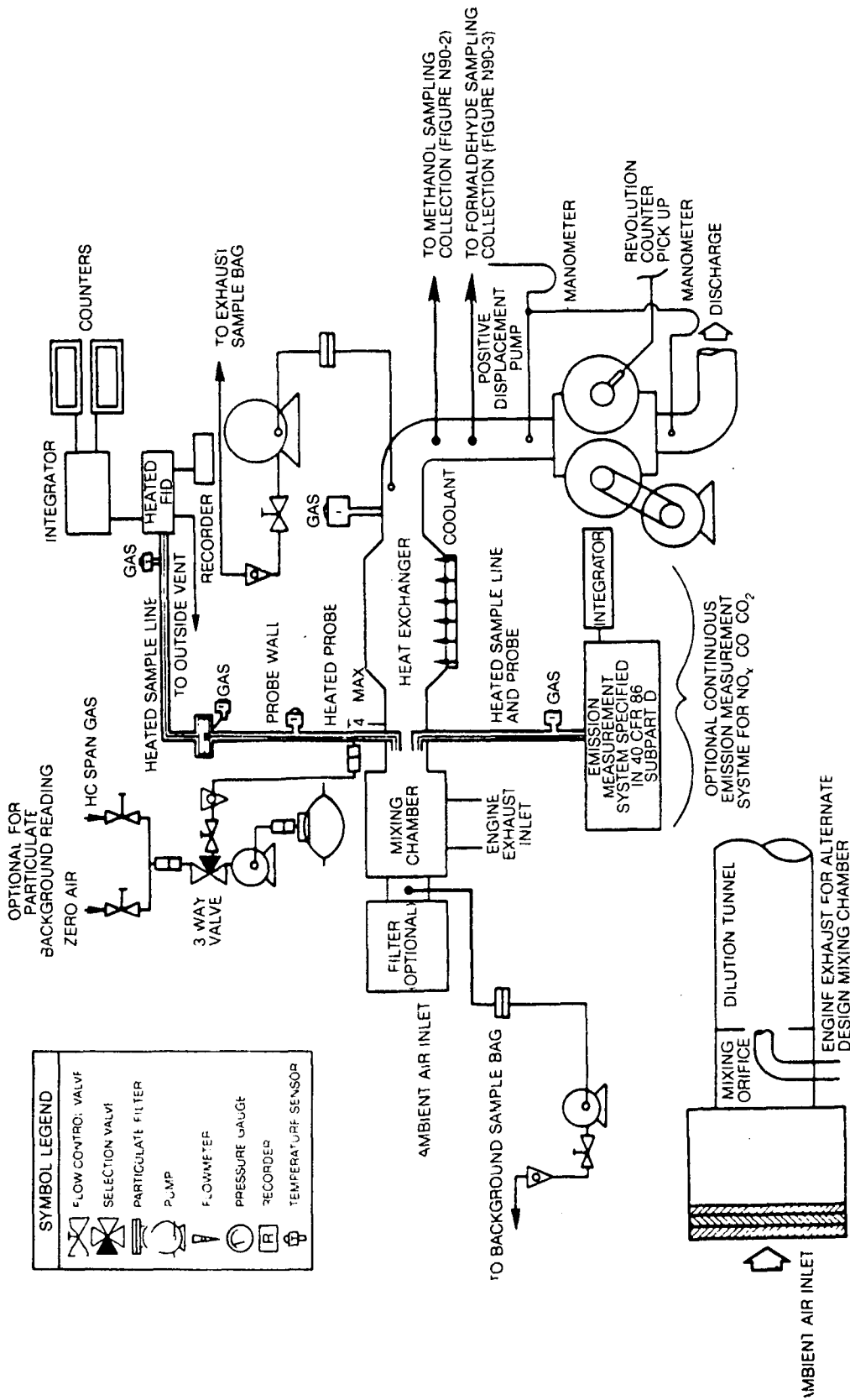


FIGURE N90-7 GASEOUS EMISSIONS SAMPLING SYSTEM (PDP-CVS)



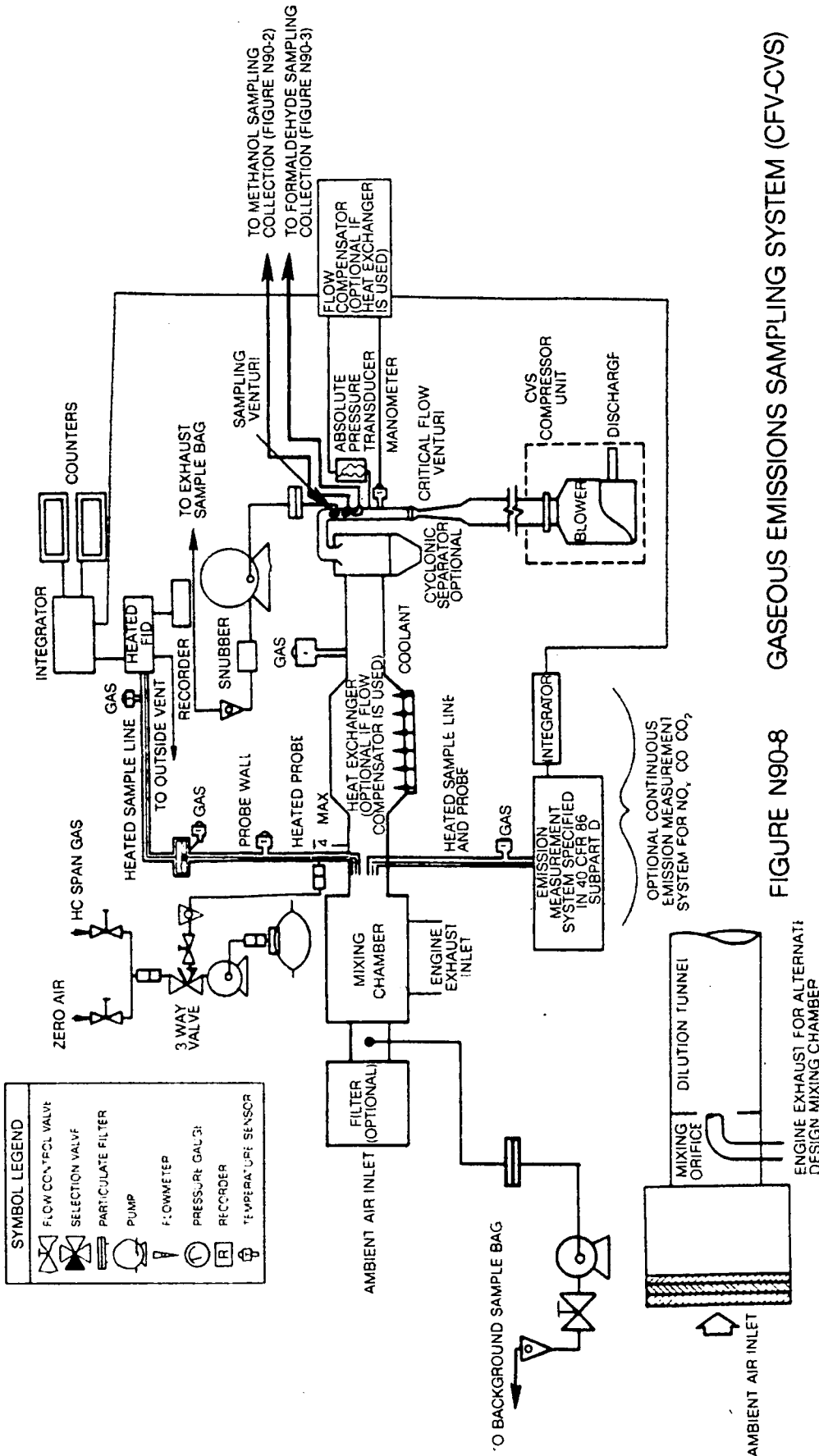


FIGURE N90-8 GASEOUS EMISSIONS SAMPLING SYSTEM (CFV-CVS)

BILLING CODE 6560-50-C

(ii) No other analyzers may draw a sample from the continuous HC sample probe, line or system, unless a common sample pump is used for all analyzers and the sample line system design reflects good engineering practice.

(iii) The overflow gas flow rates into the sample line shall be at least 105 percent of the sample system flow rate.

(iv) The overflow gases shall enter the heated sample line as close as practicable to the outside surface of the CVS duct or dilution tunnel.

(v) The continuous hydrocarbon probe shall be:

(A) Installed in the primary dilution tunnel at a point where the dilution air and exhaust are well mixed (*i.e.*, approximately 10 tunnel diameters downstream of the point where the exhaust enters the dilution tunnel).

(B) Sufficiently distant (radially) from other probes and the tunnel wall so as to be free from the influence of any wakes or eddies.

(C) Heated over the entire length to maintain a  $375 \pm 20$  °F ( $191 \pm 11$  °C) ( $235 \pm 15$  °F) ( $113 \pm 8$  °C) if continuous HC sampling is used on methanol-fueled engines) wall temperature. (Insulation and other techniques may also be used to maintain the temperature.)

(D) 0.19 in. (0.48 cm) minimum inside diameter.

(E) Free from cold spots (*i.e.*, free from spots where the probe wall temperature is less than 355 °F (180 °C)).

(vi) The dilute exhaust gas flowing in the continuous hydrocarbon sample system shall be:

(A) At  $375 \pm 10$  °F ( $191 \pm 6$  °C) ( $235 \pm 15$  °F) ( $113 \pm 8$  °C) if continuous HC is used for methanol-fueled engines) immediately before the heated filter. This gas temperature will be determined by a temperature sensor located immediately upstream of the filter. The sensor and its readout shall have an accuracy and precision of  $\pm 3.4$  °F ( $\pm 1.9$  °C).

(B) At  $375 \pm 10$  °F ( $191 \pm 6$  °C) ( $235 \pm 15$  °F) ( $113 \pm 8$  °C) if continuous HC is used for methanol-fueled engines) immediately before the HFID. This gas temperature will be determined by a temperature sensor located at the exit of the heated sample line. The sensor and its readout shall have an accuracy and precision of  $\pm 3.4$  °F (1.9 °C).

(vii) The response time of the continuous measurement system shall be no greater than:

(A) 1.5 seconds from an instantaneous step change at the port entrance to the analyzer to within 90 percent of the step change.

(B) 20 seconds from an instantaneous step change at the entrance to the sample probe or overflow span gas port

to within 90 percent of the step change. Analysis system response time shall be coordinated with CVS flow fluctuations and sampling time/test cycle offsets if necessary.

(C) For the purpose of verification of response times, the step change shall be at least 60 percent of full-scale chart deflection.

(4) *Primary-dilution tunnel.* (i) The primary dilution tunnel shall be:

(A) Small enough in diameter to cause turbulent flow (Reynolds Number greater than 4000) and of sufficient length to cause complete mixing of the exhaust and dilution air;

(B) At least 18 inches (46 cm) in diameter with a single-dilution system or at least 8 inches (20 cm) in diameter with a double-dilution system;

(C) Constructed of electrically conductive material which does not react with the exhaust components; and

(D) Electrically grounded.

(ii) The temperature of the diluted exhaust stream inside of the primary dilution tunnel shall be sufficient to prevent water condensation.

(iii) The engine exhaust shall be directed downstream at the point where it is introduced into the primary dilution tunnel.

(5) *Continuously integrated NO<sub>x</sub>, CO, and CO<sub>2</sub> measurement systems.*

(i) The sample probe shall:

(A) Be in the same plane as the continuous HC probe, but shall be sufficiently distant (radially) from other probes and the tunnel wall so as to be free from the influences of any wakes or eddies.

(B) Heated and insulated over the entire length, to prevent water condensation, to a minimum temperature of 131 °F (55 °C). Sample gas temperature immediately before the first filter in the system shall be at least 131 °F (55 °C).

(ii) The continuous NO<sub>x</sub>, CO, or CO<sub>2</sub> sampling and analysis system shall conform to the specifications of 40 CFR Part 86, Subpart D, with the following exceptions and revisions:

(A) The system components required to be heated by Subpart D need only be heated to prevent water condensation, the minimum component temperature shall be 131 °F (55 °C).

(B) The system response defined in § 86.329-79 shall be no greater than 20 seconds. Analysis system response time shall be coordinated with CVS flow fluctuations and sampling time/test cycle offsets, if necessary.

(C) Alternative NO<sub>x</sub> measurement techniques outlined in § 86.346-79 are not permitted for NO<sub>x</sub> measurement in this Subpart.

(D) All analytical gases shall conform to the specifications of § 86.1314.

(E) Any range on a linear analyzer below 155 ppm shall have and use a calibration curve conforming to § 86.330-79.

(F) The measurement accuracy requirements specified in § 86.338-79 are superseded by those specified in § 86.1338.

(iii) The chart deflections or voltage output of analyzers with non-linear calibration curves shall be converted to concentration values by the calibration curve(s) specified in Subpart D (§ 86.330-79) before flow correction (if used) and subsequent integration takes place.

(6) *Particulate sampling system.* The particulate collection system must be configured in either of two ways. The *single-dilution* method collects a proportional sample from the primary tunnel, and then passes this sample through the collection filter. The *double-dilution* method collects a proportional sample from the primary tunnel, and then transfers this sample to a secondary dilution tunnel where the sample is further diluted; the double-diluted sample is then passed through the collection filter. Proportionality (*i.e.*, mass flow ratio) between the primary tunnel flow rate and the sample flow rate must be maintained within  $\pm 5$  percent for systems with or without flow compensation. Without flow compensation, proportional sampling is achieved by introducing the secondary dilution air at a constant mass flow rate, and removing the double-diluted sample at a constant mass flow rate. The requirements for these two systems are:

(i) *Single dilution method.* (A) The particulate sample probe shall be:

(1) Installed facing upstream at a point where the dilution air and exhaust air are well mixed (*i.e.*, on the primary tunnel centerline, approximately 10 tunnel diameters downstream of the point where the exhaust enters the primary dilution tunnel).

(2) Sufficiently distant (radially) from other sampling probes so as to be free from the influence of any wakes or eddies produced by the other probes.

(3) 0.5 in. (1.3 cm) minimum inside diameter.

(4) The distance from the sampling tip to the filter holder shall be at least 5 probe diameters for filters located inside the primary dilution tunnel, and not more than 40 inches (102 cm) for filters located outside the primary dilution tunnel.

(5) Designed to minimize the deposition of particulate in the probe (*i.e.*, bends should be as gradual as

possible, protrusions (due to sensors, etc.) should be smooth and not sudden, etc.).

(B) The particulate sample pump(s) shall be located sufficiently distant from the dilution tunnel so that the inlet gas temperature is maintained at a constant temperature ( $\pm 5$  °F ( $\pm 2.8$  °C)) if flow compensation is not used.

(C) The gas meters or flow instrumentation shall be located sufficiently distant from the tunnel so that the inlet gas temperature remains constant ( $\pm 5$  °F ( $\pm 2.8$  °C)) if flow compensation is not used.

(D) Other sample flow handling and/or measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(ii) *Double-dilution method.* (A) The particulate sample transfer tube shall be configured and installed so that:

(1) The inlet faces upstream in the primary dilution tunnel at a point where the primary dilution air and exhaust are well mixed (*i.e.*, on the primary tunnel centerline, approximately 10 tunnel diameters downstream of the point where the exhaust enters the primary dilution tunnel).

(2) The particulate sample exits on the centerline of the secondary tunnel and points downstream.

(B) The particulate sample transfer tube shall be:

(1) Sufficiently distant (radially) from other sampling probes (in the primary dilution tunnel) so as to be free from the influence of any wakes or eddies produced by the other probes.

(2) 0.5 in (1.3 cm) minimum inside diameter.

(3) No longer than 36 in (91 cm) from inlet plane to exit plane.

(4) Designed to minimize the deposition of particulate during transfer (*i.e.*, bends should be as gradual as

possible, protrusions (due to sensors, etc.) should be smooth and not sudden, etc.).

(5) Constructed of electrically conductive material which does not react with the exhaust components, and electrically grounded.

(C) The secondary dilution air shall be at a temperature of  $77 \pm 9$  °F ( $25 \pm 5$  °C). For the first 10 seconds this specification is  $77 \pm 20$  °F ( $25 \pm 11$  °C).

(D) The secondary-dilution tunnel shall be:

(1) 3.0 inches (7.6 cm) minimum inside diameter.

(2) Of sufficient length so as to provide a residence time of at least 0.25 seconds for the double-diluted sample.

(3) Constructed of electrically conductive material which does not react with the exhaust components, and electrically grounded.

(E) Additional dilution air must be provided so as to maintain a sample temperature of 125 °F (51.7 °C) or less immediately before the primary sample filter.

(F) The primary filter holder shall be located within 12.0 in (30.5 cm) of the exit of the secondary dilution tunnel.

(G) Other sample flow handling and/or measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(7) *Particulate sampling filters.* (i) Fluorocarbon-coated glass fiber filters or fluorocarbon-based (membrane) filters are required.

(ii) Particulate filters must have a minimum diameter of 70 mm (60 mm stain diameter). Larger diameter filters are acceptable.

(iii) The dilute exhaust will be simultaneously sampled by a pair of filters (one primary and one back-up filter) during the cold-start test and by a second pair of filters during the hot-start

test. The back-up filter holder shall be located no more than 4 inches (10 cm) downstream of the primary filter holder. The primary and back-up filters shall not be in contact with each other.

(iv) The recommended minimum loading on a primary 70 mm filter is 5.3 milligrams. Equivalent loadings (*i.e.*, mass/stain area) are recommended for larger filters. For equivalency calculations assume the 70 mm filter has a 60 mm stain diameter.

(8) *Methanol sampling system.* The methanol sampling system, shown in Figure N90-2, consists of impingers (or sample collection capsules) containing known volumes of deionized water and sampling pump to draw the proportional sample through the impingers.

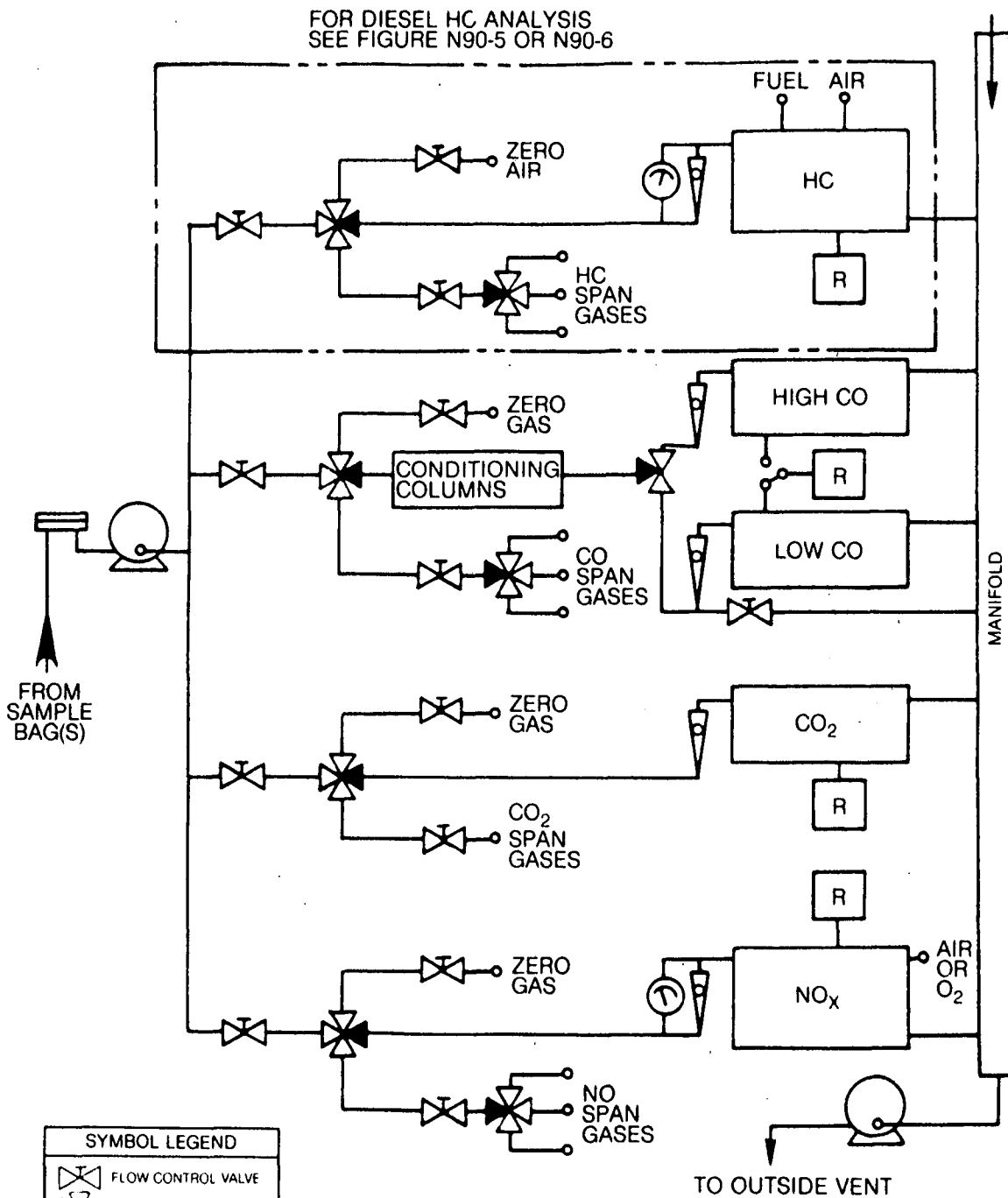
(9) *Formaldehyde sampling system.* The formaldehyde sampling system, Figure N90-3, consists of sample collection impingers and sampling pump to draw the proportional sample through the impingers.

106. A new § 86.1311-90 is added to Subpart N, to read as follows:

**§ 86.1311-90 Exhaust gas analytical system; CVS bag sample.**

(a) *Schematic drawings.* Figure N90-9 is a schematic drawing of the exhaust gas analytical system used for analyzing CVS bag samples from either Otto-cycle or diesel engines. Since various configurations can produce accurate results, exact conformance with the drawing is not required. Additional components such as instruments, valves, solenoids, pumps and switches may be used to provide additional information and coordinate the functions of the component systems. Other components such as snubbers, which are not needed to maintain accuracy in some systems, may be excluded if their exclusion is based upon good engineering judgment.

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SYMBOL LEGEND	
	FLOW CONTROL VALVE
	SELECTION VALVE
	PARTICULATE FILTER
	PUMP
	FLOWMETER
	PRESSURE GAUGE
	RECORDER
	TEMPERATURE SENSOR

FIGURE N90-9 EXHAUST GAS ANALYTICAL SYSTEM

(b) *Major component description.* The analytical system, Figure N90-9, consists of a flame ionization detector (FID) (heated for methanol-fueled (235±15 °F (113±8 °C)) and for petroleum-fueled diesel (375 ±10 °F (191 ±6 °C) engines) for the measurement of hydrocarbons, nondispersive infrared analyzers (NDIR) for the measurement of carbon monoxide and carbon dioxide, and a chemiluminescence analyzer (CL) for the measurement of oxides of nitrogen. The analytical system for methanol consists of a gas chromatograph (GC), equipped with a flame ionization detector. The analysis for formaldehyde is performed using high pressure liquid chromatography (HPLC) of 2,4-dinitrophenylhydrazine (DNPH) derivatives using ultraviolet (UV) detection. The exhaust gas analytical system shall conform to the following requirements:

(1) The CL requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(2) The carbon monoxide (NDIR) analyzer may require a sample conditioning column containing CaSO<sub>4</sub> or desiccating silica gel to remove water vapor, and containing ascarite to remove carbon dioxide from the CO analysis stream.

(i) If CO instruments are used which are essentially free of CO<sub>2</sub> and water vapor interference, the use of the conditioning column may be deleted. (See §§ 86.1322 and 86.1342.)

(ii) A CO instrument will be considered to be essentially free of CO<sub>2</sub> and water vapor interference if its response to a mixture of 3 percent CO<sub>2</sub> in N<sub>2</sub>, which has been bubbled through water at room temperature, produces an equivalent CO response, as measured on the most sensitive CO range, which is less than 1 percent of full scale CO concentration on ranges above 300 ppm full scale or less than 3 ppm on ranges below 300 ppm full scale. (See § 86.1322.)

(c) *Alternate analytical systems.* Analysis systems meeting the specifications of 40 CFR Part 86 Subpart D may be used for testing required under this subpart, with the exception of §§ 86.346 and 86.347 provided that the Subpart D systems meet the specifications of this subpart. Heated

analyzers may be used in their heated configuration.

(d) *Other analyzers and equipment.* Other types of analyzers and equipment may be used if shown to yield equivalent results and if approved in advance by the Administrator.

107. Section 86.1313-90 of Subpart N, is revised to read as follows:

§ 86.1313-90 Fuel specifications.

(a) *Otto-cycle test fuel.* (1) Gasoline having the specifications listed in Table N90-1 will be used by the Administrator in exhaust emission testing petroleum-fueled Otto-cycle engines. Gasoline having these specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust emission testing, except that the octane specification does not apply.

TABLE N90-1

Item	ASTM	Value
Octane, research, min	D2699	93
Sensitivity, min		7.5
Lead (organic), g/ U.S. gal. (g/liter)	D3237	<sup>1</sup> (0.050)
Disillation range:		
IBP, °F	D86	75-95
(°C)		(23.9-35)
10 pct. point, °F	D86	120-135
(°C)		(48.9-57.2)
50 pct. point, °F	D86	200-230
(°C)		(93.3-110)
90 pct. point, °F	D86	300-325
(°C)		(148.9-162.8)
EP, max. °F	D86	415
(°C)		(212.8)
Sulphur, max. wt. pct	D1266	0.10
Phosphorus, max., g/ U.S. gal. (g/liter)	D3231	(0.0013)
RVP, psi (kPa)	D323	8.0-9.2 (60.0-63.4)
Hydrocarbon composition:		
Olefins, max. pct	D1319	10
Aeromatics, max. pct	D1319	35
Saturates	D1319	<sup>2</sup>

<sup>1</sup> Maximum.  
<sup>2</sup> Remainder.

(2) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation.

(i) The octane rating of the gasoline used shall be not higher than one Research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the Research

octane number minus the Motor octane number.

(ii) The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(3) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled Otto-cycle engines shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (a)(3) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(4) Other methanol fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraph (a)(3) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraphs (a)(2), (a)(3), and (a)(4) of this section shall be reported in accordance with § 86.090-21(b)(3).

(b) *Diesel test fuel.* (1) The petroleum fuels for testing diesel engines employed for testing shall be clean and bright, with pour and cloud points adequate for operability. The petroleum fuel may contain nonmetallic additives as follows: Cetane improver; metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, dispersant, and biocide.

(2) Petroleum fuel for diesel engines meeting the specifications in Table N90-2, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of petroleum fuel recommended by the engine manufacturer commercially designated as "Type 1-D" or "Type 2-D" grade diesel fuel shall be used.

TABLE N90-2

Item	ASTM	Type 1-D	Type 2-D
Cetane .....	D613 .....	48-54	42-50
Distillation range:			
IBP, °F.....	D86.....	330-390	340-400
(°C).....		(165.6-198.9)	(171.1-204.4)
10 pct. point, °F.....	D86.....	370-430	400-460
(°C).....		(187.8-221.1)	(204.4-237.8)
50 pct. point, °F.....	D86.....	410-480	470-540
(°C).....		(210-248.9)	(243.3-282.2)
90 pct. point, °F.....	D86.....	460-520	550-610
(°C).....		(237.8-271.1)	(287.8-321.1)
EP, °F.....	D86.....	500-560	580-660
(°C).....		(260.0-293.3)	(304.4-348.9)
Gravity, °API.....	D287 .....	40-44	33-37
Total sulfur, pct.....	D129 or D2622 .....	0.05-0.20	0.20-0.50
Hydrocarbon composition:			
Aromatics, pct.....	D1319 .....	<sup>1</sup> 8	<sup>1</sup> 27
Paraffins, Naphthenes, Olefins .....	D1319 .....	<sup>2</sup>	<sup>2</sup>
Flashpoint, min., °F.....	D93.....	120	130
(°C).....		(48.9)	(54.4)
Viscosity, centistokes.....	D445 .....	1.6-2.0	2.0-3.2

<sup>1</sup> Minimum.  
<sup>2</sup> Remainder.

(3) Petroleum fuel for diesel engines meeting the specifications in Table N90-3, or substantially equivalent specifications approved by the

Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel recommended by the engine manufacturer, commercially designated

as "Type 1-D" or "Type 2-D" grade diesel fuel shall be used:

TABLE N90-3

Item	ASTM	Type 1-D	Type 2-D
Cetane .....	D613 .....	42-56	30-58
Distillation range:			
90 pct. point, °F.....	D86.....	440-530	540-630
(°C).....		(226.7-276.7)	(282.2-332.2)
Gravity, °API.....	287 .....	39-45	30-42
Total sulfur, min., pct.....	D129 or D2622 .....	0.05	0.20
Flashpoint, min., °F.....	D93.....	120	130
(°C).....		(48.9)	(54.4)
Viscosity, centistokes.....	D455 .....	1.2-2.2	1.5-4.5

(4) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled diesel engines shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (b)(4) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(5) Other fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraphs (b)(2) and (b)(3) or (b)(4) of

this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(6) The specification range of the fuels to be used under paragraphs (b)(2), (b)(3), (b)(4), and (b)(5) of this section shall be reported in accordance with § 86.090-21(b)(3).

(c) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

(d) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.*

(1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel vehicles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (d)(2) of this section shall be reported in accordance with § 86.090-21(b)(3).

108. A new § 86.1316-90 is added to Subpart N, to read as follows:

**§ 86.1316-90 Calibrations; frequency and overview.**

(a) Calibrations shall be performed as specified in §§ 86.1318 through 86.1326.

(b) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer, carbon dioxide analyzer, carbon monoxide analyzer, oxides of nitrogen analyzer, methanol analyzer and formaldehyde analyzer (certain analyzers may require more frequent calibration depending on the equipment and use).

(2) Calibrate the engine dynamometer flywheel torque and speed measurement transducers, and calculate the feedback signals to the cycle verification equipment.

(c) At least weekly or after any maintenance which could alter calibration, the following checks shall be performed:

(1) Check the oxides of nitrogen converter efficiency, and;

(2) Perform a CVS system verification.

(3) Check the shaft torque feedback signal at steady-state conditions by comparing:

(i) Shaft torque feedback to dynamometer beam load, or

(ii) By comparing in-line torque to armature current, or

(iii) By checking the in-line torque meter with a dead weight per § 86.1308(e).

(d) The CVS positive displacement pump or critical flow venturi shall be calibrated following initial installation, major maintenance or as necessary when indicated by the CVS system verification (described in § 86.1319).

(e) Sample conditioning columns, if used in the CO analyzer train, should be checked at a frequency consistent with observed column life or when the indicator of the column packing begins to show deterioration.

109. A new § 86.1319-90 is added to Subpart N, to read as follows:

**§ 86.1319-90 CVS calibration.**

(a) The CVS is calibrated using an accurate flowmeter and restrictor valve. The flowmeter calibration shall be traceable to the NBS, and will serve as the reference value (NBS "true" value) for the CVS calibration. (Note: In no case should an upstream screen or other restriction which can affect the flow be used ahead of the flowmeter unless calibrated throughout the flow range with such a device.) The CVS calibration procedures are designed for use of a "metering venturi" type flowmeter. Large radius or ASME flow nozzles are considered equivalent if traceable to NBS measurements. Other measurement systems may be used if shown to be equivalent under the test conditions in this section and traceable to NBS measurements. Measurements of the various flowmeter parameters are recorded and related to flow through the CVS. Procedures used by EPA for both PDP-CVS and CFV-CVS are outlined below. Other procedures yielding equivalent results may be used if approved in advance by the Administrator.

(b) After the calibration curve has been obtained, verification of the entire system may be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true mass injected. An indicated error does not necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system (e.g., analyzer calibration, leaks, or HC hangup). A verification procedure is found in paragraph (e) of this section.

(c) *PDP calibration.* (1) The following calibration procedure outlines the equipment, the test configuration, and the various parameters which must be measured to establish the flow rate of the CVS pump.

(i) All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump.

(ii) The calculated flow rate, ft<sup>3</sup>/min. (at pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value of a specific combination of pump parameters.

(iii) The linear equation which relates the pump flow and the correlation function is then determined.

(iv) In the event that a CVS has a multiple speed drive, a calibration for each range used must be performed.

(2) This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Two conditions must be maintained to assure the accuracy and integrity of the calibration curve:

(i) The temperature stability must be maintained during calibration.

(Flowmeters are sensitive to inlet temperature oscillations; this can cause the data points to be scattered. Gradual changes in temperature are acceptable as long as they occur over a period of several minutes.)

(ii) All connections and ducting between the flowmeter and the CVS pump must be absolutely void of leakage.

(3) During an exhaust emission test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

(4) Connect a system as shown in Figure N84-6. Although particular types of equipment are shown, other configurations that yield equivalent results may be used if approved in advance by the Administrator. For the system indicated, the following measurements and accuracies are required:

**CALIBRATION DATA MEASUREMENTS**

Parameter	Symbol	Units	Sensor-readout tolerances
Barometric pressure (corrected).....	P <sub>b</sub>	in. Hg (kPa).....	±0.10 in. Hg (±0.340 kPa).
Ambient temperature.....	T <sub>A</sub>	°F (°C).....	±0.5 °F (±0.28 °C).
Air temperature into metering venturi.....	ETI	°F (°C).....	±2.0 °F (±1.1 °C).
Pressure drop between the inlet and throat of metering venturi.....	EDP	in. H <sub>2</sub> O (kPa)....	±0.05 in. H <sub>2</sub> O (±0.012 kPa).
Air flow.....	Q <sub>s</sub>	ft <sup>3</sup> /min (m <sup>3</sup> /min).	±0.5% of NBS "true" value.
Air temperature at CVS pump inlet.....	PTI	°F (°C).....	±2.0 °F (±1.1 °C).
Pressure depression at CVS pump inlet.....	PPI	in. Fluid (kPa) ..	±0.13 in. Fluid (±0.055 kPa).
Specific gravity of manometer fluid (1.75 oil).....	Sp.Gr.	.....	.....
Pressure head at CVS pump outlet.....	PPO	in. Fluid (kPa) ..	±0.13 in. Fluid (±0.055 kPa).
Air temperature at CVS pump outlet (optional).....	PTO	°F (°C).....	±2.0 °F (±1.1 °C).

CALIBRATION DATA MEASUREMENTS—Continued

Parameter	Symbol	Units	Sensor-readout tolerances
Pump revolutions during test period.....	N t	Revs.....	± 1 Rev..
Elapsed time for test period.....		sec.....	±0.5 sec.

(5) After the system has been connected as shown in Figure N84-6, set the variable restrictor in the wide open position and run the CVS pump for 20 minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression that will yield a minimum of six data points for the total calibration. Allow the system to stabilize for 3 minutes and repeat the data acquisition.

(7) Data analysis:

(i) The air flow rate,  $Q_a$ , at each test point is calculated in standard cubic feet per minute (68°, 29.92 in. Hg.) from the flowmeter data using the manufacturer's prescribed method.

(ii) The air flow rate is then converted to pump flow,  $V_o$ , in cubic feet per revolution at absolute pump inlet temperature and pressure:

$$V_o = (Q_a / n) \times (T_p / 528) \times (29.92 / P_p)$$

Where:

(A)  $V_o$  = Pump flow, ft<sup>3</sup>/rev (m<sup>3</sup>/rev) at  $T_p$ ,  $P_p$ .

(B)  $Q_a$  = Meter air flow rate in standard cubic feet per minute, standard conditions are 68 °F, 29.92 in. Hg (20 °C, 101.3 kPa).

(C)  $n$  = Pump speed in revolutions per minute.

(D)  $T_p$  = Pump inlet temperature °R(°K) = PTI + 460 (°R), or = PTI + 273 (°K).

(E)  $P_p$  = Absolute pump inlet pressure, in. Hg. (kPa) =  $P_B - PPI$  (Sp.Gr./13.5955) and =  $P_B - PPI$  for SI units.

Where:

(F)  $P_B$  = barometric pressure, in. Hg. (kPa).

(G) PPI = Pump inlet depression, in. fluid (kPa).

(H) Sp.Gr. = Specific gravity of manometer fluid.

(iii) The correlation function at each test point is then calculated from the calibration data:

$$X_o = \frac{1}{n} \sqrt{\frac{\Delta P}{P_e}}$$

Where:

(A)  $X_o$  = correlation function.

(B)  $D_p$  = The pressure differential from pump inlet to pump outlet, in. Hg. (kPa).

$$= P_e - P_p$$

(C)  $P_e$  = Absolute pump outlet pressure, in. Hg. (kPa)

$$= P_B + PPO \text{ (Sp.Gr./13.5955) and}$$

$$= P_B + PPO \text{ for SI units.}$$

Where:

(D) PPO = Pressure head at pump outlet, in. fluid (kPa).

(iv) A linear least squares fit is performed to generate the calibration equation which has the form:

$$V_o = D_o - M(X_o)$$

$D_o$  and  $M$  are the intercept and slope constants, respectively, describing the regression line.

(8) A CVS system that has multiple speeds should be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values,  $D_o$ , will increase as the pump flow range decreases.

(9) If the calibration has been performed carefully, the calculated values from the equation will be within

±0.50 percent of the measured value of  $V_o$ . Values of  $M$  will vary from one pump to another, but values of  $D_o$  for pumps of the same make, model and range should agree within ±3 percent of each other. Particulate influx over time will cause the pump slip to decrease, as reflected by lower values for  $M$ . Calibrations should be performed at pump start-up and after major maintenance to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

(d) CFV calibration. (1) Calibration of the CFV is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_v = \frac{K_v P}{\sqrt{T}}$$

Where:

(i)  $Q_v$  = flow.

(ii)  $K_v$  = calibration coefficient

(iii)  $P$  = absolute pressure.

(iv)  $T$  = absolute temperature.

The calibration procedure described in paragraph (d)(3) of this section establishes the value of the calibration coefficient at measured values of pressure, temperature and air flow.

(2) The manufacturer's recommended procedure shall be followed for calibrating electronic portions of the CFV.

(3) Measurements necessary for flow calibration are as follows:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected).....	$P_B$	in. Hg (kPa).	±0.10 in. Hg. (±0.340 kPa).
Air temperature, into flowmeter.....	ETI	°F (°C).....	±0.5°F (±0.28 °C).



## CALIBRATION DATA MEASUREMENTS—Continued

Parameter	Symbol	Units	Tolerances
Pressure drop between the inlet and throat of metering venturi.....	EDP	in. H <sub>2</sub> O (kPa).	±0.05 in. H <sub>2</sub> O (±0.012 kPa).
Air flow.....	Q <sub>a</sub>	ft <sup>3</sup> /min (m <sup>3</sup> / min).	±0.5% of NBS "true" value.
CFV inlet depression.....	PPI	in. fluid (kPa).	±0.13 in. fluid (±0.055 kPa).
Temperature at venturi inlet.....	T <sub>v</sub>	°F (°C).....	±4.0°F (±2.22 °C).
Specific gravity of manometer fluid (1.75 oil).....	Sp. Gr		

(4) Set up equipment as shown in Figure N84-7 and eliminate leaks. (Leaks between the flow measuring devices and the critical flow venturi will seriously affect the accuracy of the calibration.)

(5) Set the variable flow restrictor to the open position, start the blower, and allow the system to stabilize. Record data from all instruments.

(6) Vary the flow restrictor and make at least eight readings across the critical flow range of the venturi.

(7) *Data analysis.* The data recorded during the calibration are to be used in the following calculations:

(i) The air flow rate, Q<sub>a</sub>, at each test point is calculated in standard cubic feet per minute from the flow meter data using the manufacturer's prescribed method.

(ii) Calculate values of the calibration coefficient for each test point:

$$K_v = \frac{Q_a \sqrt{T_v}}{P_v}$$

Where:

(A) Q<sub>a</sub> = Flow rate in standard cubic feet per minute, at the standard conditions of 68 °F, 29.92 in Hg (20 °C, 101.3 kPa).

(B) T<sub>v</sub> = Temperature at venturi inlet, °R (°K).

(C) P<sub>v</sub> = Pressure at venturi inlet, in. Hg. (kPa)  
= P<sub>R</sub> - PPI (Sp.Gr./13.5955), and  
= P<sub>B</sub> - PPI for SI units.

Where:

(D) PPI = Venturi inlet pressure depression, in. fluid (kPa).

(E) Sp.Gr. = Specific gravity of manometer fluid.

(iii) Plot K<sub>v</sub> as a function of venturi inlet pressure. For choked flow, K<sub>v</sub> will have a relatively constant value. As pressure decreases (vacuum increases), the venturi becomes unchoked and K<sub>v</sub> decreases. (See Figure N84-8.)

(iv) For a minimum of 8 points in the critical region calculate an average K<sub>v</sub> and the standard deviation.

(v) If the standard deviation exceeds 0.3 percent of the average K<sub>v</sub>, take corrective action.

(e) *CVS system verification.* The following "gravimetric" technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system. (Verification can also be accomplished by constant flow metering using critical flow orifice devices.)

(1) Obtain a small cylinder that has been charged with pure propane or carbon monoxide gas (CAUTION—carbon monoxide is poisonous). Obtain another small cylinder which has been charged with pure methanol if the system will be used for methanol-fueled vehicle testing. Since this cylinder will be heated to 150–155 °F, care must be taken to ensure that the liquid volume of methanol placed in the cylinder does not exceed approximately one-half of the total volume of the cylinder.

(2) Determine a reference cylinder weight to the nearest 0.01 grams.

(3) Operate the CVS in the normal manner and release a quantity of pure propane into the system during the sampling period (approximately 5 minutes).

(4) Following the completion of step (3) above, continue to operate the CVS in the normal manner and release a quantity of pure methanol into the system during the sampling period (approximately 5 minutes).

(5) The calculations of § 86.1342 are performed in the normal way except in the case of propane. The density of propane (17.30 g/ft<sup>3</sup>/carbon atom (0.6109 kg/m<sup>3</sup>/carbon atom)) is used in place of the density of exhaust hydrocarbons. In the case of methanol, the density of 37.71 g/ft<sup>3</sup> (1.332 kg/m<sup>3</sup>) is used.

(6) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.

(7) Good engineering practice requires that the cause for any discrepancy

greater than ±2 percent must be found and corrected.

110. A new § 86.1320–90 is added to Subpart N, to read as follows:

**§ 86.1320–90 Gas meter or flow instrumentation calibration; particulate, methanol, and formaldehyde measurement.**

(a) Sampling for particulate, methanol and formaldehyde emissions requires the use of gas meters or flow instrumentation to determine flow through the particulate filters, methanol impingers and formaldehyde impingers. These instruments shall receive initial and periodic calibrations as follows:

(1)(i) Install a calibration device in series with the instrument. A critical flow orifice, a bellmouth nozzle, or a laminar flow element or an NBS traceable flow calibration device is required as the standard device.

(ii) The flow system should be checked for leaks between the calibration and sampling meters, including any pumps that may be part of the system, using good engineering practice.

(2) Flow air through the calibration system at the sample flow rate used for particulate, methanol, and formaldehyde testing and at the backpressure which occurs during the sample test.

(3) When the temperature and pressure in the system have stabilized, measure the indicated gas volume over a time period of at least five minutes or until a gas volume of at least ±1 percent accuracy can be determined by the standard device. Record the stabilized air temperature and pressure upstream of the instrument and as required for the standard device.

(4) Calculate air flow at standard conditions as measured by both the standard device and the instrument(s). (Standard conditions are defined as 68 °F (20 °C) and 29.92 in Hg (101.3 kPa).)

(5) Repeat the procedures of paragraphs (a) (2) through (4) of this section using at least two flow rates which bracket the typical operating range.

(6) If the air flow at standard conditions measured by the instrument differs by  $\pm 1.0$  percent of the maximum operating range or  $\pm 2.0$  percent of the point (whichever is smaller), then a correction shall be made by either of the following two methods:

(i) Mechanically adjust the instrument so that it agrees with the calibration measurement at the specified flow rates using the criteria of paragraph (a)(6) of this section, or

(ii) Develop a continuous best fit calibration curve for the instrument (as a function of the calibration device flow measurement) from the calibration points to determine corrected flow. The points on the calibration curve relative to the calibration device measurements must be within  $\pm 1.0$  percent of the maximum operating range of  $\pm 2.0$  percent of the point (whichever is smaller).

(7) For double dilution systems, the accuracy of the secondary dilution flow measurement device should be within  $\pm 1.0$  percent of the total flow through the filter.

(b) *Other systems.* A bell prover may be used to calibrate the instrument if the procedure outlined in ANSI B109.1-1973 is used. Prior approval by the Administrator is not required to use the bell prover.

111. A new § 86.1321-90 is added to Subpart N, to read as follows:

**§ 86.1321-90 Hydrocarbon analyzer calibration.**

The FID hydrocarbon analyzer shall receive the following initial and periodic calibration. The HFID used with petroleum-fueled diesel engines shall be operated to a set point  $\pm 10$  °F ( $\pm 5.5$  °C) between 365 and 385 °F (185 and 197 °C).

The HFID used with methanol-fueled engines shall be operated at  $235 \pm 15$  °F ( $113 \pm 8$  °C).

(a) *Initial and periodic optimization of detector response.* Prior to introduction into service and at least annually thereafter, the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow good engineering practices for initial instrument start-up and basic operating adjustment using the appropriate fuel (see § 86.1314) and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer a propane-in-air mixture with a propane concentration equal to approximately 90 percent of the most common operating range.

(3) One of the following procedures is required for FID or HFID optimization:

(i) The procedures outlined in Society of Automotive Engineers (SAE) paper No. 770141, "Optimization of Flame Ionization Detector for Determination of Hydrocarbons in Diluted Automobile Exhaust"; author, Glenn D. Reschke.

(ii) The HFID optimization procedures outlined in 40 CFR Part 86, Subpart D.

(iii) Alternative procedures may be used if approved in advance by the Administrator.

(4) After the optimum flow rates have been determined, they are recorded for future reference.

(b) *Initial and periodic calibration.* Prior to introduction into service and monthly thereafter, the FID or HFID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges. Use the same flow

rate and pressures as when analyzing samples. Calibration gases shall be introduced directly at the analyzer, unless the "overflow" calibration option of § 86.1310(b)(3)(i) for the HFID is taken.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each used operating range with propane-in-air calibration gases having nominal concentrations of 15, 30, 45, 60, 75 and 90 percent of that range. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(c) *FID response factor to methanol.* When the FID analyzer is to be used for the analysis of hydrocarbon samples containing methanol, the methanol response factor of the analyzer shall be established. The methanol response factor shall be determined at several concentrations in the range of concentrations in the exhaust sample.

(1) The bag sample of methanol for analysis in the FID shall be prepared using the apparatus shown in Figure N90-10. A known volume of methanol is injected, using a microliter syringe, into the heated mixing zone (250 °F (121 °C)) of the apparatus. The methanol is vaporized and swept into the sample bag with a known volume of zero-grade air measured by a dry gas meter

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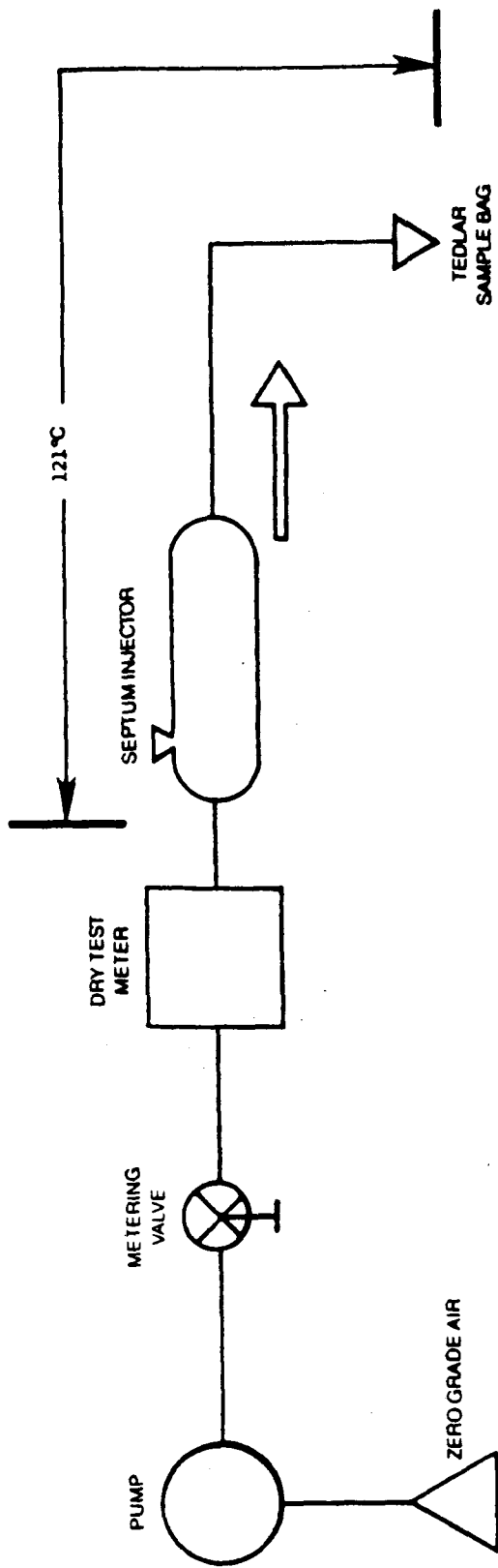


FIGURE N90-10 APPARATUS FOR PREPARATION OF FID METHANOL RESPONSE CALIBRATION MIX

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(2) The bag sample is analyzed using the FID.

(3) The FID response factor,  $r$ , is calculated as follows:

$$r = \text{FIDppm} / \text{SAMppm}$$

Where:

- (i)  $r$  = FID response factor.
- (ii) FIDppm = FID reading in ppmC.
- (iii) SAMppm = methanol concentration in the sample bag in ppmC

$$= \frac{0.02406 \times \text{fuel injected} \times \text{fuel density}}{\text{Air volume} \times \text{mol. wt. CH}_3\text{OH}}$$

Where:

- (iv) 0.02406 = volume of one mole at 29.92 in Hg and 68 °F, m<sup>3</sup>.
- (v) Fuel injected = volume of methanol injected, ml.
- (vi) Fuel density = density of methanol, 0.7914 g/ml.
- (vii) Air volume = volume of zero-grade air, m<sup>3</sup>.
- (viii) Mol. Wt. CH<sub>3</sub>OH = 32.04.

112. A new § 86.1326-90 is added to Subpart N, to read as follows:

**§ 86.1326-90 Calibration of other equipment.**

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice. Specific equipment requiring calibration is the gas chromatograph and flame ionization detector used in measuring methanol and the high pressure liquid chromatograph (HPLC) and ultraviolet detector for measuring formaldehyde.

113. A new § 86.1327-90 is added to Subpart N, to read as follows:

**§ 86.1327-90 Engine dynamometer test procedures; overview.**

(a) The engine dynamometer test procedure is designed to determine the brake specific emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, particulate (petroleum-fueled and methanol-fueled diesel engines), and methanol and formaldehyde (for methanol-fueled diesel engines). The test procedure consists of a "cold" start test following either natural or forced cool-down periods described in §§ 86.1334 and 86.1335, respectively. A "hot" start test follows the "cold" start test after a hot soak of 20 minutes. The idle test of Subpart P may be run after the "hot" start test. The exhaust emissions are diluted with ambient air and a continuous proportional sample is collected for analysis during both the cold- and hot-start tests. The composite samples collected are analyzed either in bags or continuously for hydrocarbons (HC), carbon monoxide (CO), carbon

dioxide (CO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>), or in sample collection impingers for methanol (CH<sub>3</sub>OH) and sample collection impingers (or capsules) for formaldehyde (HCHO). Measurement of CH<sub>3</sub>OH and HCHO may be omitted for 1990 through 1994 model year methanol-fueled engines when a FID calibrated on methanol is used. A bag or continuous sample of the dilution air is similarly analyzed for background levels of hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen and, if appropriate, methanol and formaldehyde. In addition, for petroleum-fueled and methanol-fueled diesel engines, particulates are collected on fluorocarbon-coated glass fiber filters or fluorocarbon-based (membrane) filters, and the dilution air may be prefiltered.

(b) Engine torque and rpm shall be recorded continuously during both the cold and hot start tests. Data points shall be recorded at least once every second.

(c) Using the torque and rpm feedback signals the brake horsepower is integrated with respect to time for the cold and hot cycles. This produces a brake horsepower-hour value that enables the brake-specific emissions to be determined (see § 86.1342, Calculations; gaseous exhaust emissions, and § 86.1343, Calculations; particulate exhaust emissions.).

(d)(1) When an engine is tested for exhaust emissions or is operated for service accumulation on an engine dynamometer, the complete engine shall be tested, with all emission control devices installed and functioning.

(2) Evaporative emission controls need not be connected if data are provided to show that normal operating conditions are maintained in the engine induction system.

(3) On air-cooled engines, the fan shall be installed.

(4) Additional accessories (e.g., oil cooler, alternators, air compressors, etc.) may be installed or their loading simulated if typical of the in-use application.

(5) The engine may be equipped with a production type starter.

(e) Means of engine cooling which will maintain the engine operating temperatures (e.g., temperatures of intake air, oil, water, etc.) at approximately the same temperature as specified by the manufacturer shall be used. Auxiliary fan(s) may be used to maintain engine cooling during operation on the dynamometer. Rust inhibitors and lubrication additives may be used, up to the levels recommended by the additive manufacturer. Antifreeze mixtures and other coolants typical of

those approved for use by the manufacturer may be used.

(f) *Exhaust system.* The exhaust system shall meet the following requirements:

(1) *Gasoline-fueled and methanol-fueled Otto-cycle engines.* A chassis-type exhaust system shall be used. For all catalyst systems, the distance from the exhaust manifold flange(s) to the catalyst shall be the same as in the vehicle configuration unless the manufacturer provides data showing equivalent performance at another location.

(2) *Petroleum-fueled and methanol-fueled diesel engines.* Either a chassis-type or a facility-type exhaust system or both systems simultaneously may be used. The exhaust backpressure or restriction shall be typical of those seen in the actual average vehicle exhaust system configuration and may be set with a valve (muffler omitted).

(i) The engine exhaust system shall meet the following requirements:

(A) The total length of the tubing from the exit of the engine exhaust manifold or turbocharger outlet to the primary dilution tunnel should not exceed 32 feet (9.8 m).

(B) The initial portion of the exhaust system may consist of a typical in-use (i.e., length, diameter, material, etc.) chassis-type exhaust system.

(C) The distance from the exhaust manifold flange(s) to any exhaust aftertreatment device shall be the same as in the vehicle configuration unless the manufacturer is able to demonstrate equivalent performance at another location.

(D) If the exhaust system tubing from the exit of the engine exhaust manifold or turbocharger outlet to the primary dilution tunnel exceeds 12 feet (3.7 m) in length, then all tubing in excess of 12 feet (3.7 m) (chassis and/or facility type) shall be insulated.

(E) If the tubing is required to be insulated, the radial thickness of the insulation must be at least 1.0 inch. The thermal conductivity of the insulating material must have a value no greater than 0.75 BTU-in/hr/ft<sup>2</sup>/°F measured at 700 °F.

(F) A smoke meter or other instrumentation may be inserted into the exhaust system tubing. If this option is exercised in the insulated portion of the tubing, then a minimal amount of tubing not to exceed 18 inches may be 1ft uninsulated. However, no more than 12 feet of tubing can be left uninsulated in total, including the length at the smoke meter.

(ii) The facility-type exhaust system shall meet the following requirements:

(A) It must be composed of smooth tubing made of typical in-use steel or stainless steel. This tubing shall have a maximum inside diameter of 6.0 in (15 cm).

(B) Short sections (altogether not to exceed 20 percent of the entire tube length) of flexible tubing at connection points are allowed.

114. A new § 86.1330-90 is added to Subpart N, to read as follows:

**§ 86.1330-90 Test sequence; general requirements.**

(a) The test sequence shown in Figure N84-10 shows the major steps of the test procedure.

(b) *Control of air temperature.* (1) The temperature of the CVS dilution air shall be maintained at greater than 68 °F (20 °C) throughout the test sequence, except as permitted by § 86.1335-90.

(2) For engines with auxiliary emission control devices which are temperature dependent (e.g., chokes, air cleaner hot air doors) the test cell ambient air temperature and the temperature of the engine intake air shall be maintained at 77 ± 9 °F (25 °C ± 5 °C) throughout the test sequence.

(3) For engines which are not equipped with temperature dependent auxiliary emission control devices, the test cell ambient air temperature and the temperature of the engine intake air shall be greater than 68 °F (20 °C). No corrections will be made in test results or measured engine power if 86 °F (30 °C) is exceeded.

(4) The only exceptions to these temperatures are as noted in § 86.1335.

(c) No control of ambient air, engine intake air or CVS dilution air humidity is required.

(d) The idle test of Subpart P may be run after completion of the hot start exhaust emission test, if applicable.

(e) The barometric pressure observed during the generation of the maximum torque curve shall not deviate more than 1 in. Hg. from the value measured at the beginning of the map. The average barometric pressure observed during the exhaust emission test must be within 1 in. Hg. of the average observed during the maximum torque curve generation.

(f) *Petroleum-fueled and methanol-fueled diesel engines.* (1)(i) Air inlet and exhaust restrictions shall be set to represent the average restrictions which would be seen in use in a representative application.

(ii) Inlet depression and exhaust backpressure shall be set with the engine operating at rated speed and wide open throttle, except for the case of inlet depression for naturally aspirated engines, which shall be set at maximum engine speed and nominal zero load (high idle).

(iii) The location at which the inlet depression and exhaust backpressure is measured shall be specified by the manufacturer.

(iv) The settings shall take place during the final mode of the preconditioning prior to determining the maximum torque curve.

(2)(i) The temperature of the inlet fuel to the engine shall not exceed 110 °F (or 130 °F during the first 10 seconds of the hot start test).

(ii) The pressure of the inlet fuel and the point at which it is measured shall be specified by the manufacturer.

(g) Pre-test engine measurements (e.g., governed petroleum-fueled or methanol-fueled diesel engine high idle speed, petroleum-fueled or methanol-fueled diesel engine fuel flows, etc.), pre-test engine performance checks (e.g., verification of actual rated rpm, etc.) and pre-test system calibrations (e.g., inlet and exhaust restrictions, etc.) shall be made prior to generation of the maximum torque curve. This can be done during engine preconditioning, or at the manufacturer's convenience subject to the requirements of good engineering practice.

115. A new § 86.1332-90 is added to Subpart N, to read as follows:

**§ 86.1332-90 Engine mapping procedures.**

(a) Mount test engine on the engine dynamometer.

(b) Determine minimum mapping speed. The minimum speed is defined as the warm engine curb idle rpm.

(c) Determine maximum mapping speed per the following methodologies. (Note paragraph (d)(1) below.)

(1) *Gasoline-fueled and methanol-fueled Otto-cycle engines.* (i) For uncontrolled engines using the transient operating cycle set forth in paragraph (f)(1) of Appendix I to this part, the maximum mapping speed shall be no less than that calculated from the following equation:

$$\text{Maximum speed} = \text{curb idle rpm} + \frac{105 (\text{measured rated rpm} - \text{curb idle rpm})}{100}$$

or when a 3.0 percent drop in maximum horsepower occurs, whichever of the two is greater

(ii) For uncontrolled engines using the transient operating cycle set forth in paragraph (f)(3) of Appendix I to this

part, the maximum mapping shall be no less than that calculated from the following equation:

$$\text{Maximum speed} = \text{curb idle rpm} + \frac{115 (\text{measured rated rpm} - \text{curb idle rpm})}{100}$$

or when a 3.0 percent drop in maximum horsepower occurs, whichever of the two is greater

(iii) For governed engines the maximum mapped speed shall be no

less than either that speed at which the wide-open throttle torque drops off to zero, or the maximum speed as calculated for uncontrolled engines (paragraph (c)(1)(i) of this section)

(2) *Petroleum-fueled and methanol-fueled diesel engines.* (i) For uncontrolled engines, the maximum mapping speed shall be no less than that calculated from the following equation:

Maximum speed = curb idle rpm +

113 (measured rated rpm - curb idle rpm)

100

or when a 3.0 drop in horsepower occurs, whichever of the two is greater

(ii) For governed engines, the maximum mapping speed shall be no less than either that speed at which wide-open throttle torque drops off to zero, or the maximum speed as calculated for ungoverned engines (paragraph (c)(2)(i) of this section).

(d) Perform an engine power map.

(1) During engine preparation or warm-up, the engine may be operated such that a preliminary estimate of measured rated rpm can be made.

(2) *Gasoline-fueled and methanol-fueled Otto-cycle engines.* (i) For a cold engine, start the engine and operate at zero load in accordance with the manufacturer's start-up and warm-up procedures for 1 minute  $\pm 30$  seconds.

(ii) Operate the engine at a torque equivalent to  $10 \pm 3$  percent of the most recent determination of maximum torque for 4 minutes  $\pm 30$  seconds at 2000 rpm.

(iii) Operate the engine at a torque equivalent to  $55 \pm 5$  percent of the most recent determination of maximum torque for 35 minutes  $\pm 1$  minute at 2000 rpm.

(iv) Operate the engine at idle (minimum speed).

(v) Open the throttle fully.

(vi) While maintaining wide-open throttle and full-load, maintain minimum engine speed for at least 15 seconds. Record the average torque during the last 5 seconds.

(vii) In no greater than  $100 \pm 20$  rpm increments, determine the maximum torque curve from minimum speed to maximum speed. Hold each test point for 15 seconds, and record the average torque over the last 5 seconds.

(viii) *Alternate mapping technique.* In place of paragraphs (d)(2) (vi) and (vii) of this section, a continual sweep of rpm is allowed. While operating at wide-open throttle, the engine speed is increased at an average rate of 8 rpm/sec ( $\pm 1$  rpm/sec) from minimum speed to maximum speed. Speed and torque points shall be recorded at a sample rate of at least one point per second.

(ix) Recalculate the maximum speed per paragraph (c)(1) (i) or (ii) of this section using the measured rated speed derived from the new maximum torque curve. If the new maximum speed lies outside the range of speeds encompassed by the actual map, then the map shall be considered void, and another map will need to be run using

the newly derived measured rated speed in all calculations.

(x) For warm engines, the entire warm-up procedure specified in paragraphs (d)(2) (i) through (iii) of this section need not be repeated. It is sufficient for an engine already at normal operating temperatures to be operated at the conditions specified in paragraph (d)(2)(iii) of this section until oil and water temperatures are stabilized, after which the procedures of paragraph (d)(2) (iv) through (vii) of this section may be performed. The oil and water temperatures are defined as stabilized if they are maintained within 2 percent of point for 2 minutes.

(3) *Petroleum-fueled and methanol-fueled diesel engines.* (i) If the engine is cold, start and operate at free idle for 2 to 3 minutes.

(ii) Operate the engine at approximately 50 percent power at the peak torque speed for 5 to 7 minutes.

(iii) Operate the engine at rated speed and wide-open throttle for 25 to 30 minutes.

(iv) *Option.* The engine may be pre-conditioned by operating at rated speed and maximum horsepower until the oil and water temperatures are stabilized. The temperatures are defined as stabilized if they are maintained within 2 percent of point for 2 minutes. This optional procedure may be substituted for paragraph (d)(3)(iii) of this section.

(v) Unload the engine and operate at the curb idle speed.

(vi) Operate the engine at wide open throttle and minimum engine speed. Increase the engine speed at an average rate of 8 rpm/sec ( $\pm 1$  rpm/sec) from minimum to maximum speed. Engine speed and torque points shall be recorded at a sample rate of at least one point per second.

(vii) Recalculate the maximum speed per paragraph (c)(2) (i) or (ii) of this section using the measured rated speed derived from the new maximum torque curve. If the new maximum speed lies outside the range of speeds encompassed by the actual map, then the map shall be considered void. The entire mapping procedure shall be repeated, using the newly derived measured rated speed in all calculations.

(viii) For warm engines, the entire warm-up procedure specified in paragraphs (d)(3) (i) through (iv) of this section need not be repeated. It is sufficient for an engine already at

normal operating temperatures to be operated per the requirements of paragraph (d)(3)(iv) of this section, after which the procedures of paragraph (d)(3) (v) through (vi) of this section may be performed.

(e) Mapping curve generation.

(1) *Gasoline-fueled and methanol-fueled Otto-cycle engines.* (i) Fit all data points recorded under paragraphs (d)(2) (vi) and (vii) of this section (100 rpm increments) with a cubic spline, Akima, or other technique approved in advance by the Administrator. The resultant curve shall be accurate to within  $\pm 1.0$  ft-lbs of all recorded engine torques.

(ii) All points generated under the continuous rpm sweep by paragraphs (d)(2) (vi) and (viii) of this section shall be connected by linear interpolation between points.

(iii) For governed engines, all points above the maximum speed (see paragraph (c)(1)(ii) of this section) shall be assigned maximum torque values of zero for purposes of cycle generation.

(iv) For all engines, all speed points below the minimum speed shall be assigned a maximum torque value equal to that observed at minimum speed for purposes of cycle generation.

(v) The torque curve resulting from paragraphs (e)(1) (i) through (iv) of this section is the mapping curve and will be used to convert the normalized torque values in the engine cycle (see paragraph (f)(1) of Appendix I to this part) to actual torque values for the test cycle.

(2) *Petroleum-fueled and methanol-fueled diesel engines.* (i) Connect all data points recorded under paragraph (d)(3)(vi) of this section using linear interpolation between points.

(ii) For governed engines, all points above the maximum speed (see paragraph (c)(2)(ii) of this section) shall be assigned maximum torque values of zero for purposes of cycle generation.

(iii) For all engines, all speed points below the minimum speed shall be assigned a maximum torque value equal to that observed at the minimum speed for purposes of cycle generation.

(iv) The torque curve resulting from paragraphs (e)(2) (i) through (iii) of this section is the mapping curve and will be used to convert the normalized torque values in the engine cycle (see paragraph (f)(2) of Appendix I to this part) into actual torque values for the test cycle.

(f) *Alternate mapping.* If a manufacturer believes that the above mapping techniques are unsafe or unrepresentative for any given engine or engine family, alternate mapping techniques may be used. These alternate techniques must satisfy the intent of the specified mapping procedures to determine the maximum available torque at all engine speeds achieved during the test cycles. Deviations from the mapping techniques specified in this section for reasons of safety or representativeness shall be reported per § 86.1344(e)(6), along with the justification for their use. In no case, however, shall descending continual

sweeps of rpm be used for governed or turbocharged engines.

(g) *Replicate Tests.* An engine need not be mapped before each and every cold cycle test. An engine shall be remapped prior to a cold cycle test if:

- (1) An unreasonable amount of time has transpired since the last map, as determined by engineering judgment, or
- (2) The barometric pressure prior to the start of the cold cycle test has changed more than 1 in hg. from the average barometric pressure observed during the map, or
- (3) Physical changes or recalibrations have been made to the engine which

may potentially affect engine performance.

116. A new § 86.1333-90 is added to Subpart N, to read as follows:

**§ 86.1333-90 Transient test cycle generation.**

(a) The heavy-duty transient engine cycles for Otto-cycle and diesel engines are listed in Appendix I ((f) (1), (2) and (3)) to this part. These second-by-second listings represent torque and rpm maneuvers characteristic of heavy-duty engines. Both rpm and torque are normalized (expressed as a percentage of maximum) in these listings.

(1) To unnormalize rpm, use the following equation:

$$\text{Actual rpm} = \frac{\% \text{ rpm (Measured rated rpm - Curb idle rpm)}}{100} + \text{Curb idle rpm}$$

The method of calculating measured rated rpm is detailed in paragraph (g) of this section.

(2) Torque is normalized to the maximum torque at the rpm listed with it. Therefore, to unnormalize the torque values in the cycle, the maximum torque curve for the engine in question must be used. The generation of the maximum torque curve is described in § 86.1332.

(3) The EPA Engine Dynamometer Schedule for Heavy Duty Diesel Engines listed in Appendix I (f)(2) contains torque points referred to as "closed rack motoring." For reference cycle calculation torque points shall take on

unnormalized values determined in either of the following three ways:

(i) Negative 40 percent of the positive torque available at the associated speed point. The generation of this positive maximum torque curve is described in § 86.1332.

(ii) Map the amount of negative torque required to motor the engine between idle and maximum mapping speed and use this map to determine the amount of negative torque required at the associated speed point.

(iii) Determine the amount of negative torque required to motor the engine at

idle and rated speeds and linearly interpolate using these two points.

(b) *Example of the unnormalization procedure.* The following test point shall be unnormalized:

Percent RPM	Percent Torque
43	82

Given the following values:

Measured Rated rpm = 3800.

Curb Idle rpm = 600.

(1) Calculate actual rpm:

$$\text{Actual rpm} = \frac{\% \text{ rpm (measured rated rpm - curb idle rpm)}}{100} + \text{curb idle rpm}$$

$$= \frac{43 (3800 - 600)}{100} + 600$$

$$= \frac{43 (3800 - 600)}{1976} + 600$$

during the cold start test and hot start test. The torque and rpm feedback signals may be electronically filtered.

(d) *Cold start enhancement devices.* The zero percent speed specified in the engine dynamometer schedules (Appendix I, (f)(1), (f)(2) or (f)(3) to this part) shall be superseded by proper operation of the engine's automatic cold start enhancement device.

(1) During automatic cold start enhancement device operation a manual transmission engine shall be allowed to idle at whatever speed is required to produce a feedback torque of 0 ft-lbs ± 10 ft-lbs (using, for example, clutch disengagement, speed to torque control switching, software overrides, etc.) at those points in Appendix I, (f)(1), (f)(2)

or (f)(3) to this part where both reference speed and reference torque are zero percent values.

(2) During automatic cold start enhancement device operation an automatic transmission engine shall be allowed to idle at whatever speed is required to produce a feedback torque of CITT ft-lbs ± 10 ft-lbs (see (e)(2) of this section for definition of CITT) at those points in Appendix I (f)(1), (f)(2) or (f)(3) to this part where both reference speed and reference torque are zero percent values.

(3) For Otto-cycle engines tested without an operating clutch, modification to the cycle validation criteria for this automatic cold start enhancement device high idle allowance

(2) *Determine actual torque:* Determine the maximum observed torque at 1976 rpm from the maximum torque curve. Then multiply this value (e.g., 358 ft-lbs) by 0.82. This results in an actual torque of 294 ft-lbs.

(c) Engine speed and torque shall be recorded at least once every second

is permitted only for the first 150 seconds of the cold cycle and the first 30 seconds of the hot cycle. After this, the cycles shall be run as specified in Appendix I (f)(1) or (f)(3) to this part. (See § 86.1341-90 for allowances in the cycle validation criteria.)

(4) For diesel engines tested without an operating clutch, modification to the cycle validation criteria for this automatic cold start enhancement device high idle allowance is permitted only for up to the first 180 seconds of the cold cycle or up to the first 30 seconds of the hot cycle. However, the sum of the seconds deleted from the cold cycle plus the sum of the seconds deleted from the hot cycle may not exceed 180 seconds. After this, the cycles shall be run as specified in Appendix I (f)(2) to this part. (See 86.1341 for allowances in the cycle validation criteria.)

(e) *Automatic transmissions.* The reference cycles in paragraphs (f) (1) and (2) of Appendix I to this part shall be altered for test engines intended primarily for use with automatic transmissions.

(1) Zero percent speed for automatic transmission engines is defined as curb idle rpm (*i.e.*, in-vehicle, coupled with automatic transmission in gear).

(2) All zero-percent speed, zero-percent torque points (idle points) shall be modified to zero percent speed,  $x$  percent torque, except as permitted in § 86.1337(a)(8). Using the manufacturers' specified curb idle transmission torque (CITT), the maximum torque available at the curb idle (*i.e.*, with transmission) rpm as determined from the maximum torque curve generated in § 86.1332.  $x$  percent torque is defined per the following equation:

$$r_{\text{rpm}} = \frac{\text{CITT} \times 100}{\text{Maximum torque at curb idle rpm}}$$

The manufacturer's specified CITT shall be based upon those observed in typical applications.

(f) *Clutch operation.* Manual transmission engines may be tested with a clutch. If used, the clutch shall be disengaged at all zero percent speeds, zero percent torque points, but may be engaged up to two points preceding a non-zero point, and may be engaged for time segments with zero percent speed and torque points of durations less than four seconds. (See § 86.1341 for allowances in the cycle validation criteria.)

(g) *Measured rated rpm.* The measured rated rpm corresponds to the 100 percent rpm values specified in the reference cycles (paragraphs (f) (1) and

(2) of Appendix I to this part). It is generally intended to represent the rpm at which maximum brake horsepower occurs. For the purposes of this test sequence, it shall either be defined as the manufacturer's specified rated speed, or calculated in the following way, whichever yields the higher speed:

(1) From the maximum torque curve generated per § 86.1332, find the maximum observed brake horsepower of the engine.

(2) Calculate 98 percent of the observed maximum brake horsepower, and determine from the maximum torque curve the highest and lowest engine rpms at which this brake horsepower is observed.

(3) The highest and lowest of the 98 percent power rpms represent the endpoints of an rpm range. The midpoint of this range shall be considered the measured rated rpm for cycle generation purposes.

117. A new § 86.1335-90 is added to Subpart N, to read as follows:

**§ 86.1335-90 Optional forced cool-down procedure.**

(a) This forced cool-down procedure applies to Otto-cycle and diesel engines.

(b) No substances or fluids may be applied to the engine's internal or external surfaces except for water and air as prescribed in paragraphs (c) and (d) of this section.

(c) For water-cooled engines two types of cooling are permitted:

(1) Water may be circulated through the engine's water coolant system.

(i) The cooling water may be flowed in either direction and at any desired flow rate. The thermostat may be removed or blocked open during the cool-down but must be restored before the exhaust emissions test begins.

(ii) The temperature of the circulated or injected water shall be at least 10 °C (50 °F). In addition, the temperature of the cooling water shall not exceed 30 °C (86 °F) during the last 30 minutes of the forced cool-down.

(iii) Only water, including the use of a building's standard water supply, or the coolant that is already in the engine (per § 86.1327(e)) is permitted for forced cool-down purposes.

(2) Flows of air may be directed at the exterior of the engine.

(i) The air shall be directed essentially uniformly over the exterior surface of the engine at any desired flow rate.

(ii) The temperature of the cooling air shall not exceed 86 °F (30 °C) during the last 30 minutes of the cool-down, but may be less than 68 °F (20 °C) at any time.

(d) For air-cooled engines, only cooling as prescribed in paragraph (c)(2) of this section is permitted.

(e)(1) The cold cycle exhaust emission test may begin after a forced cool-down only when the engine oil temperature is stabilized between 68 °F and 75 °F (20 °C and 24 °C) for a minimum of ten minutes.

(i) This temperature measurement is to be made by a temperature measurement device immersed in the sump oil, the sensor part of which is not in contact with any engine surface.

(ii) The forced cool-down apparatus shall be shut off during this measurement. No engine oil change is permitted during the test sequence.

(2) Direct forced cooling of engine oil through the use of oil coolers or heat exchangers is permitted, but the cold cycle emission test may begin only when the circulating water temperature has stabilized to within 5 °F (2.8 °C) of the stabilized oil temperature.

(3) Any other means for the direct forced cooling of the engine oil must be approved in advance by the Administrator.

(f)(1) The cold cycle exhaust emission test for engines equipped with catalytic converters may begin after a forced cool-down only when the catalyst bed temperature at the catalyst outlet is 77 °F ± 9 °F (25 °C ± 5 °C), in addition to the temperature restrictions in paragraph (e) of this section.

(2) Catalyst cool-down may be accomplished in whatever manner and using whatever coolant deemed appropriate by proper engineering judgment. The catalyst, engine, and exhaust piping configurations shall not be separated, altered, or moved in any way during the cool-down.

(g) At the completion of the forced cool-down all of the general requirements specified in § 86.1330, the oil temperature specification set forth in paragraph (e) of this section, and the catalyst temperature specifications in paragraph (f) of this section must be met before the cold cycle exhaust emission test may begin.

118. A new § 86.1337-90 is added to Subpart N, to read as follows:

**§ 86.1337-90 Engine dynamometer test run.**

(a) The following steps shall be taken for each test:

(1) Prepare the engine, dynamometer, and sampling system for the cold-start test. Change filters, etc., and leak check as necessary.

Note: For a single dilution particulate system, a propane check will not reveal a pressure side leak (that portion of the system downstream of the pump) since the volume



concentration in ppm will not change if a portion of the sample is lost. A separate leak check is needed.

A leak check of a filter assembly that has only one seal ring in contact with the filter media will not detect a leak when tested under vacuum. A pressure leak test should be performed.

(2) Connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(3) For methanol-fueled vehicles, install fresh methanol and formaldehyde impingers (or capsules) in the exhaust and dilution air sample systems for methanol and formaldehyde. A single dilution air sample covering the total test period may be utilized for formaldehyde background.

(4) Attach the CVS to the engine exhaust system any time prior to starting the CVS.

(5) Start the CVS (if not already on), the sample pumps (except for the particulate sample pump(s), if applicable), the engine cooling fan(s), and the data collection system. The heat exchanger of the constant volume sampler (if used), and the heated components of any continuous sampling system(s) (if applicable) shall be preheated to their designated operating temperatures before the test begins. (See § 86.1340(e) for continuous sampling procedures.)

(6) Adjust the sample flow rates to the desired flow rates and set the CVS gas flow measuring devices to zero.

Note: CFV-CVS sample flow rate is fixed by the venturi design.

(7) For petroleum-fueled and methanol-fueled diesel engines, carefully install a clean particulate sample filter into each of the filter holders and install the assembled filter holders in the sample flow line. (Filter holders may be preassembled.)

(8) Follow the manufacturer's choke and throttle instructions for cold starting. Simultaneously start the engine and begin exhaust and dilution air sampling. For petroleum-fueled diesel engines (and methanol-fueled diesels, if used) turn on the hydrocarbon and  $\text{NO}_x$  (and CO and  $\text{CO}_2$ , if continuous) analyzer system integrators (if used), and turn on the particulate sample pumps and indicate the start of the test on the data collection medium.

(9) As soon as it is determined that the engine is started, start a "free idle" timer.

(10) Begin the transient engine cycles such that the first non-idle record of the cycle occurs at  $25 \pm 1$  seconds. The free idle time is included in the  $25 \pm 1$  seconds.

(i) During diesel particulate testing without the use of flow compensation,

adjust the sample pump(s) so that the flow rate through the particulate sample probe or transfer tube is maintained at a value within  $\pm 5$  percent of the set flow rate.

(ii) During diesel particulate sampling with the use of flow compensation (*i.e.*, proportional control of sample flow), it must be demonstrated that the ratio of main tunnel flow to particulate sample flow does not change by more than  $\pm 5.0$  percent of its set point value (except for the first 10 seconds of sampling).

Note: for double dilution operation, sample flow is the net difference between the flow rate through the sample filters and the secondary dilution air flow rate.

(iii) Record the average temperature and pressure at the gas meter(s) or flow instrumentation inlet. If the set flow rate cannot be maintained because of high particulate loading on the filter, the test shall be terminated. The test shall be rerun using a lower flow rate and/or a larger diameter filter.

(11) Begin the transient engine cycles such that the first non-idle record of the cycle occurs at  $25 \pm 1$  seconds. The free idle time is included in the  $25 \pm 1$  seconds. During particulate testing without the use of flow compensation, adjust the sample pump(s) so that the flow rate through the particulate sample probe or transfer tube is maintained at a constant value within  $\pm 5$  percent of the set flow rate. Record the average temperature and pressure at the gas meter(s) or flow instrumentation inlet. If the set flow rate cannot be maintained because of high particulate loading on the filter, the test shall be terminated. The test shall be rerun using a lower flow rate and/or a larger diameter filter.

(12) On the last record of the cycle, cease sampling. Immediately turn the engine off, and start a hot-soak timer. Also turn off the particulate sample pumps, the gas flow measuring device(s) and any continuous analyzer system integrators and indicate the end of the test on the data collection medium. Sampling systems should continue to sample after the end of the test cycle until system response times have elapsed.

(13) Immediately after the engine is turned off, turn off the engine cooling fan(s) if used, and the CVS blower (or disconnect the exhaust system from the CVS). As soon as possible, transfer the "cold start cycle" exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.1340. A stabilized reading of the exhaust sample on all analyzers shall be obtained within 20 minutes of the end of the sample collection phase of the test. Analysis of the methanol and formaldehyde samples shall be obtained

within 24 hours of the end of the sample collection period. For petroleum-fueled and methanol-fueled diesel engines, carefully remove the filter holder from the sample flow apparatus, and remove each particulate sample filter from its holder and place each in a petri dish and cover.

(14) Allow the engine to soak for  $20 \pm 1$  minutes.

(15) Prepare the engine and dynamometer for the hot start test.

(16) Connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(17) Install fresh methanol and formaldehyde impingers (or capsules) in the exhaust and dilution air sample systems for methanol and formaldehyde.

(18) Start the CVS (if not already on) or connect the exhaust system to the CVS (if disconnected). Start the sample pumps (except the particulate sample pump(s), if applicable), the engine cooling fan(s) and the data collection system. The heat exchanger of the constant volume sampler (if used) and the heated components of any continuous sampling system(s) (if applicable) shall be preheated to their designated operating temperatures before the test begins. See § 86.1340(e) for continuous sampling procedures.

(19) Adjust the sample flow rates to the desired flow rate and set the CVS gas flow measuring devices to zero.

(20) For petroleum-fueled and methanol-fueled diesel engines, carefully install a clean particulate filter in each of the filter holders and install assembled filter holders in the sample flow line. (Filter holders may be preassembled.)

(21) Follow the manufacturer's choke and throttle instruction for hot starting. Simultaneously start the engine and begin exhaust and dilution air sampling. For diesel engines, turn on the hydrocarbon and  $\text{NO}_x$  (and CO and  $\text{CO}_2$ , if continuous) analyzer system integrators (if used), indicate the start of the test on the data collection medium, and turn on the particulate sample pump(s).

(22) As soon as it is determined that the engine is started, start a "free idle" timer.

(23) Allow the engine to idle freely with no-load for  $24 \pm 1$  seconds. The provisions and interpretations of paragraph (a)(10) of this section apply.

(24) Begin the transient-engine cycle such that the first non-idle record of the cycle occurs at  $25 \pm 1$  seconds. The free idle is included in the  $25 \pm 1$  seconds.

(25) On the last record of the cycle, allow sampling system response times to elapse and cease sampling. Turn off

the particulate sample pump(s) (if appropriate), the gas flow measuring device(s) and any continuous analyzer system integrators and indicate the end of the test on the data collection medium.

(26) As soon as possible, transfer the "hot start cycle" exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.1340. A stabilized reading of the exhaust sample on all analyzers shall be obtained within 20 minutes of the end of the sample collection phase of the test. Analyze the methanol and formaldehyde samples within 24 hours. (If it is not possible to perform analysis within 24 hours, the samples should be stored in a cold (approximately 0°C) dark environment until analysis can be performed). For petroleum fueled and methanol-fueled diesel engines, carefully remove the assembled filter holder from the sample flow lines and remove each particulate sample filter from its holder and place in a clean petri dish and cover as soon as possible. Within 1 hour after the end of the hot start phase of the test, transfer the four particulate filters to the weighing chamber for post-test conditioning.

(27) The CVS and the engine may be turned off, if desired.

(b) The procedure in paragraph (a) of this section is designed for one sample bag for the cold start portion and one for the hot start portion. It is also permissible to use more than one sample bag per test portion.

(c) If a dynamometer test run is determined to be void, corrective action may be taken. The engine may then be allowed to cool (naturally or forced) and the dynamometer test rerun per paragraph (a) or (b) of this section.

119. A new § 86.1339-90 is added to Subpart N, to read as follows:

**§ 86.1339-90 Particulate filter handling and weighing.**

(a) At least 1 hour, but not more than 80 hours, before the test, place each filter in a closed (to eliminate dust contamination) but unsealed (to permit humidity exchange) petri dish and place in a weighing chamber meeting the specifications of § 86.1312 for stabilization.

(b) At the end of the stabilization period, weigh each filter on a balance having a precision of 20 micrograms and a readability of 10 micrograms. This reading is the tare weight and must be recorded (see § 86.1344(e)(18)).

(c) The filter shall then be stored in a covered petri dish or a sealed filter holder, either of which shall remain in the weighing chamber until needed for testing.

(d) If the filter is not used within 1 hour of its removal from the weighing chamber, it must be re-weighed before use. This limit of 1 hour may be replaced by an 8-hour limit if either of the following three conditions are met:

(1) A stabilized filter is placed and kept in a sealed filter holder assembly with the ends plugged, or

(2) A stabilized filter is placed in a sealed filter holder assembly, which is then immediately placed in a sample line through which there is no flow, or

(3) A combination of the conditions specified in paragraphs (d) (1) and (2).

(e) After the emissions test, and after the sample and back-up filters have been returned to the weighing room after being used, they must be conditioned for at least 1 hour but not more than 80 hours and then weighed. This reading is the gross weight of the filter and must be recorded (see § 86.1344(e)(18)).

(f) The net weight of each filter is its gross weight minus its tare weight. Should the sample on the filter contact the petri dish or any other surface, the test is void and must be rerun.

(g) The particulate filter weight ( $P_i$ ) is the sum of the net weight of the primary filter plus the net weight of the backup filter.

(h) The following optional weighting procedure is permitted:

(1) At the end of the stabilization period, weigh both the primary and back-up filters as a pair on a balance having a precision of 20 micrograms and a readability of 10 micrograms. This reading is the tare weight and must be recorded (see § 86.1344(e)(18)).

(2) After the emissions test, in removing the filters from the filter holder, the back-up filter is inverted on top of the primary filter. They must then be conditioned in the weighing chamber for at least one hour but not more than 80 hours. The filters are then weighed as a pair. This reading is the gross weight of the filters ( $P_i$ ) and must be recorded (see § 86.1344-90(e)(18)).

(3) Paragraphs (a), (c), (d), and (f) of this section apply to this option, except that the word "filter" is replaced by "filters."

120. A new § 86.1340-90 is added to Subpart N, to read as follows:

**§ 86.1340-90 Exhaust sample analysis.**

(a) The analyzer response may be read by automatic data collection (ADC) equipment such as computers, data loggers, etc. If ADC equipment is used the following is required:

(1) For bag analysis, the analyzer response must be stable at greater than 99 percent of the final reading for the dilute exhaust sample bag. A single

value representing the average chart deflection over a 10-second stabilized period shall be stored. For the background bag, all readings taken during the 10-second interval must be stable at the final value to within  $\pm 1$  percent of full scale.

(2) For continuous analysis systems, the ADC system must read at least two analyzer readings per second. A single value representing the average integrated concentration over a cycle shall be stored.

(3) The chart deflections or average integrated concentrations required in paragraphs (a) (1) and (2) of this section may be stored on long-term computer storage devices such as computer tapes, storage discs, punch cards, or they may be printed in a listing for storage. In either case a chart recorder is not required and records from a chart recorder, if they exist, need not be stored.

(4) If the data from ADC equipment is used as permanent records, the ADC equipment and the analyzer values as interpreted by the ADC equipment are subject to the calibration specifications in §§ 86.1316 through 86.1326, as if the ADC equipment were part of the analyzer.

(b) Data records from any one or a combination of analyzers may be stored as chart recorder records.

(c) *Software zero and span.* (1) The use of "software" zero and span is permitted. The process of software zero and span refers to the technique of initially adjusting the analyzer zero and span responses to the calibration curve values, but for subsequent zero and span checks the analyzer response is simply recorded without adjusting the analyzer gain. The observed analyzer response recorded from the subsequent check is mathematically corrected back to the calibration curve values for zero and span. The same mathematical correction is then applied to the analyzer's response to a sample of exhaust gas in order to compute the true sample concentration.

(2) The maximum amount of software zero and span mathematical correction is  $\pm 10$  percent of full scale chart deflection.

(3) Software zero and span may be used to switch between ranges without adjusting the gain of the analyzer.

(4) The software zero and span technique may not be used to mask analyzer drift. The observed chart deflection before and after a given time period or event shall be used for computing the drift. Software zero and span may be used after the drift has been computed to mathematically adjust

any span drift so that the "after" span check may be transformed into the "before" span check for the next segment.

(d) For bag sample analysis perform the following sequence:

(1) Warm-up and stabilize the analyzers; clean and/or replace filter elements, conditioning columns (if used), etc., as necessary.

(2) Obtain a stable zero reading.

(3) Zero and span the analyzers with zero and span gases. The span gases shall have concentrations between 75 and 100 percent of full-scale chart deflection. The flow rates and system pressures during spanning shall be approximately the same as those encountered during sampling. A sample bag may be used to identify the required analyzer range.

(4) Re-check zero response. If this zero response differs from the zero response recorded in paragraph (d)(3) of this section by more than 1 percent of full scale, then paragraphs (d) (2), (3), and (4) of this section should be repeated.

(5) If a chart recorder is used, identify and record the most recent zero and span response as the pre-analysis values.

(6) If ADC equipment is used, electronically record the most recent zero and span response as the pre-analysis values.

(7) Measure HC (except diesels), CO, CO<sub>2</sub>, and NO<sub>x</sub> sample and background concentrations in the sample bag(s) with approximately the same flow rates and pressures used in paragraph (d)(3) of this section. (Constituents measured continuously do not require bag analysis.)

(8) A post-analysis zero and span check of each range must be performed and the values recorded. The number of events that may occur between the pre and post checks is not specified. However, the difference between pre-analysis zero and span values (recorded in paragraph (d) (5) or (6) of this section) versus those recorded for the post-analysis check may not exceed the zero drift limit or the span drift limit of 2 percent of full scale chart deflection for any range used. Otherwise the test is void.

(e) For continuous sample analysis perform the following sequence:

(1) Warm-up and stabilize the analyzers; clean and/or replace filter elements, conditioning columns (if used), etc., as necessary.

(2) Leak check portions of the sampling system that operate at negative gauge pressures when sampling, and allow heated sample lines, filters, pumps, etc., to stabilize at operating temperature.

(3) *Optional*: Perform a hang-up check for the HFID sampling system:

(i) Zero the analyzer using zero air introduced at the analyzer port.

(ii) Flow zero air through the overflow sampling system. Check the analyzer response.

(iii) If the overflow zero response exceeds the analyzer zero response by 2 percent or more of the HFID full-scale deflection, hang-up is indicated and corrective action must be taken.

(iv) The complete system hang-up check specified in paragraph (f) of this section is recommended as a periodic check.

(4) Obtain a stable zero reading.

(5) Zero and span each range to be used on each analyzer used prior to the beginning of the cold cycle. The span gases shall have a concentration between 75 and 100 percent of full scale chart deflection. The flow rates and system pressures shall be approximately the same as those encountered during sampling. The HFID analyzer shall be zeroed and spanned through the overflow sampling system.

(6) Re-check zero response. If this zero response differs from the zero response recorded in paragraph (e)(5) of this section by more than 1 percent of full scale, then paragraphs (e) (4), (5), and (6) of this section should be repeated.

(7) If a chart recorder is used, identify and record the most recent zero and span response as the pre-analysis values.

(8) If ADC equipment is used, electronically record the most recent zero and span response as the pre-analysis values.

(9) Measure the emissions (HC required for diesels; NO<sub>x</sub>, CO, CO<sub>2</sub> optional) continuously during the cold start cycle. Indicate the start of the test, the range(s) used, and the end of the test on the recording medium (chart paper or ADC equipment). Maintain approximately the same flow rates and system pressures used in paragraph (e)(5) of this section.

(10) Collect background HC, CO, CO<sub>2</sub>, and NO<sub>x</sub> in a sample bag.

(11) Perform a post-analysis zero and span check for each range used at the conditions specified in paragraph (e)(5) of this section. Record these responses as the post-analysis values.

(12) Neither the zero drift nor the span drift between the pre-analysis and post-analysis checks on any range used may exceed 3 percent for HC, or 2 percent for NO<sub>x</sub>, CO, and CO<sub>2</sub>, of full scale chart deflection, or the test is void. (If the HC drift is greater than 3 percent of full-scale chart deflection, hydrocarbon hang-up is likely.)

(13) Determine HC background levels for the cold start cycle by introducing the background sample into the overflow sample system.

(14) Determine background levels of NO<sub>x</sub>, CO, or CO<sub>2</sub> (if necessary) by the bag technique outlined in paragraph (d) of this section.

(15) Repeat paragraphs (e) (4) through (14) of this section for the hot cycle. The post-analysis zero and span check for the cold start (or previous hot start) cycle may be used for the pre-analysis zero and span for the following hot start cycle.

(f) *HC hang-up*. If HC hang-up is indicated, the following sequence may be performed:

(1) Fill a clean sample bag with background air.

(2) Zero and span the HFID at the analyzer ports.

(3) Analyze the background air sample bag through the analyzer ports.

(4) Analyze the background air through the entire sample probe system.

(5) If the difference between the readings obtained is 2 percent or more of the HFID full scale deflection, clean the sample probe and the sample line.

(6) Reassemble the sample system, heat to specified temperature, and repeat the procedure in paragraphs (f) (1) through (6) of this section.

(g) *For CH<sub>3</sub>OH* (methanol-fueled vehicles):

(1) Introduce a reference sample of methanol (the concentration of methanol in deionized water is known, and is  $C_{MR}$  in the calculations) into the gas chromatograph and measure the area of the response peak. This reference sample peak area is  $A_{MR}$  in the calculations.

(2) Introduce test samples into the gas chromatograph and measure the area of the response peak. This peak area is  $A_{MS}$  in the calculations.

(h) *For HCHO* (methanol-fueled vehicles):

(1) Introduce a reference sample of formaldehyde (the concentration of formaldehyde as a dinitrophenylhydrazine derivative in acetonitrile ( $C_{FR}$ ) is known) into the high pressure liquid chromatograph and measure the area of the response peak. This reference sample peak area is  $A_{FR}$  in the calculations.

(2) Introduce test samples into the high pressure liquid chromatograph and measure the area of the response peak. This peak area is  $A_{FS}$  in the calculations.

121. A new § 86.1341-90 is added to Subpart N, to read as follows:

§ 86.1341-90 Test cycle validation criteria.

(a) To minimize the biasing effect of the time lag between the feedback and reference cycle values, the entire engine speed and torque feedback signal sequence may be advanced or delayed in time with respect to the reference speed and torque sequence. If the feedback signals are shifted, both speed and torque must be shifted the same amount in the same direction.

(b) Calculate the brake horsepower for each pair of engine feedback speed and torque values recorded. Also calculate the reference brake

horsepower for each pair of engine speed and torque reference values. Calculations shall be to five significant digits.

(c) Linear regressions of feedback value on reference value shall be performed for speed, torque and brake horsepower. The method of least-squares shall be used, with the best fit equation having the form:

$$y = mx + b$$

Where:

(1)  $y$  = The feedback (actual) value of speed (rpm), torque (ft-lbs), or brake horsepower.

(2)  $m$  = Slope of the regression line.

(3)  $x$  = The reference value (speed, torque, or brake horsepower).

(4)  $b$  = The y-intercept of the regression line.

(d) The standard error of estimate (SE) of  $y$  on  $x$  and the coefficient of determination ( $r^2$ ) shall be calculated for each regression line.

(e) For a test to be considered valid, the criteria in Figure N90-11 must be met for both cold and hot cycles individually. Point deletions from the regression analyses are permitted where noted in Figure N90-11.

FIGURE N90-11

	Speed	Torque	BHP
Regression Line Tolerances			
Petroleum-fueled and methanol-fueled diesel engines			
Standard error of estimate (SE) of Y on X.....	100 rpm.....	13 pct of power map maximum engine torque.	8 pct of power map maximum BHP.
Slope of the regression line, $m$ .....	0.970 to 1.030.....	0.83-1.03 (hot), 0.77-1.03 (cold).	0.89-1.03 (hot), 0.87-1.03 (cold).
Coefficient of determination, $r^2$ .....	<sup>1</sup> 0.9700.....	<sup>1</sup> 0.8800 (hot), <sup>1</sup> 0.8500 (cold) ..	<sup>1</sup> 0.9100.
Y intercept of the regression line, $b$ .....	$\pm 50$ rpm.....	$\pm 15$ ft-lb + .....	$\pm 5.0$ BHP.
Gasoline-fueled and methanol-fueled Otto-cycle engines			
Standard error of estimate (SE) of Y on X.....	100 rpm.....	10% (hot), 11% (cold) of power map max. engine torque.	5% (hot), 6% (cold) of power map max. BHP.
Slope of the regression line, $m$ .....	0.980 to 1.020.....	0.92-1.03 (hot), 0.88-1.03 (cold).	0.93-1.03 (hot), 0.89-1.03 (cold)
Coefficient of determination, $r^2$ .....	<sup>1</sup> 0.9700.....	<sup>1</sup> 0.9300 (hot), <sup>1</sup> 0.9000 (cold) ..	<sup>1</sup> 0.9400 (hot), <sup>1</sup> 0.9300 (cold)
Y intercept of the regression line, $b$ .....	$\pm 25$ (hot), $\pm 40$ (cold).	$\pm 4\%$ (hot), $\pm 5\%$ (cold) of power map max. engine torque.	$\pm 2.0\%$ (hot), $\pm 2.5\%$ (cold) of power map BHP.

<sup>1</sup> Minimum.

Permitted Point Deletions From Regression Analysis

Condition	Points to be deleted
First 24 ( $\pm 1$ ) seconds of free idle of hot and cold cycles.....	Speed, Torque, BHP.
Wide-open throttle, and speed control, and torque feedback, torque reference.....	Torque, BHP.
Wide open throttle, and torque control, and speed feedback, speed reference.....	Speed, BHP.
Speed control, and gasoline-fueled or methanol-fueled Otto-cycle engine, and closed throttle, and torque reference, torque feedback, and:	
A. Manual transmission, and reference torque not equal to zero, or.....	Torque, BHP.
B. Automatic transmission, and reference torque not equal to curb idle transmission torque .....	Do.
Speed control, and petroleum-fueled or methanol-fueled diesel engine, and reference torque equals "closed rack" .....	Do.
Gasoline-fueled or methanol-fueled Otto cycle engine, and equipped with automatic choke, and first 150 s. of cold cycle or first 30 s. of hot cycle, and closed throttle, and no clutch (or with clutch engaged during idle periods), and:	
A. Manual transmission, and torque feedback is equal to zero ( $\pm 10$ ft-lbs), or.....	Speed, BHP.
B. Automatic transmission, and torque feedback is equal to curb idle transmission torque ( $\pm 10$ ft-lbs).....	Do.
Petroleum-fueled or methanol fueled diesel engines equipped with cold engine idle speed enrichment up to the first 180 s. of cold cycle or up to the first 30 s. of hot cycle, the sum of the seconds deleted of cold cycle plus the sum of the seconds deleted from the hot cycle may not exceed 180 s. and closed throttle and no clutch (or with clutch engaged during idle periods), and:	
A. Manual transmission, and torque feedback is equal to zero ( $\pm 10$ ft-lbs).....	Do.
B. Automatic transmission, and torque feedback is equal to curb idle transmission torque ( $\pm 10$ ft-lbs).....	Do.
Engine equipped with an operating clutch, and clutch disengaged .....	Do.

(f)(1) The integrated brake horsepower-hour for each cycle (cold and hot start) shall be between -15 percent and +5 percent of the integrated brake horsepower-hour for the reference cycle, or the test is void.

(2) For gasoline-fueled and methanol-fueled Otto-cycle engines, the integrated

brake horsepower-hour of the feedback cycle shall be within 5 percent of the integrated brake horsepower-hour of the reference cycle for the cold cycle, or the test is void. The tolerance for the hot cycle shall be 4 percent.

(g) If a dynamometer test run is determined to be statistically or

experimentally void, corrective action shall be taken. The engine shall then be allowed to cool (naturally or forced) and the dynamometer test rerun per § 86.1337.

(h) For petroleum-fueled and methanol-fueled diesel engines, all reference torque values specified (in

paragraph (f)(2) of Appendix I to this part) as "closed rack" shall be deleted from the calculation of cycle torque and power validation statistics. Associated reference and feedback brake horsepower points shall be set equal to zero for purposes of calculating integrated power-hour for petroleum-fueled and methanol-fueled diesel engines, and also for gasoline-fueled and methanol-fueled Otto-cycle engines whenever the reference torque is less than zero percent. (Note the regression deletions are specified in Figure N90-11.)

122. A new § 86.1342-90 is added to Subpart N, to read as follows:

**§ 86.1342-90 Calculations; exhaust emissions.**

(a) The final reported transient emission test results should be computed by using the following formula:

$$A_{WM} = \frac{(1/7)(g_C) + (6/7)(g_H)}{(1/7)(BHP-hr_C) + (6/7)(BHP-hr_H)}$$

Where:

(1)  $A_{WM}$  = Weighted mass emission level (HC, CO, CO<sub>2</sub>, or NO<sub>x</sub>) in grams per brake horsepower-hour and, if appropriate, the weighted mass organic material hydrocarbon equivalent, in grams per brake horsepower-hour.

(2)  $g_C$  = Mass emission level in grams or grams carbon mass equivalent, measured during the cold start test.

(3)  $g_H$  = Mass emission level in grams or grams carbon mass equivalent, measured during the hot start test.

(4)  $BHP-hr_C$  = Total brake horsepower-hour (brake horsepower integrated over time) for the cold start test.

(5)  $BHP-hr_H$  = Total brake horsepower-hour (brake horsepower

integrated over time) for the hot start test.

(b) The mass of each pollutant for the cold start test and the hot start test for bag measurements and diesel continuously heated sampling system measurements is determined from the following equations:

- (1) Hydrocarbon mass:  
 $HC_{mass} = V_{mix} \times \text{Density}_{HC} \times (HC_{conc}/10^6)$
- (2) Oxides of nitrogen mass:  
 $NO_{x_{mass}} = V_{mix} \times \text{Density}_{NO_2} \times K_H \times (NO_{x_{conc}}/10^6)$
- (3) Carbon monoxide mass:  
 $CO_{mass} = V_{mix} \times \text{Density}_{CO} \times (CO_{conc}/10^6)$
- (4) Carbon dioxide mass:  
 $CO_{2_{mass}} = V_{mix} \times \text{Density}_{CO_2} \times (CO_{2_{conc}}/10^2)$
- (5) Methanol mass:  
 $CH_3OH_{mass} = V_{mix} \times \text{Density}_{CH_3OH} \times (CH_3OH_{conc}/10^6)$
- (6) Formaldehyde mass:  
 $HCHO_{mass} = V_{mix} \times \text{Density}_{HCHO} \times (HCHO_{conc}/10^6)$
- (7) Organic material hydrocarbon equivalent mass:
  - (i)

$$OMHCE = HC_{mass} + \frac{13.8756}{32.042} (CH_3OH_{mass}) + \frac{13.8756}{30.0262} (HCHO_{mass})$$

(c) The mass of each pollutant for the cold start test and the hot start test for

flow compensated sample systems is

determined from the following equations:

$$(1) \text{ HC}_{\text{mass}} = \sum_{i=1}^n \left[ \frac{(\text{HC}_e)_i}{10^6} \times (V_{\text{mix}})_i \times (\text{Density}_{\text{HC}}) \times \Delta T \right] \\ - \frac{\text{HC}_d}{10^6} \left( 1 - \frac{1}{\text{DF}} \right) \times V_{\text{mix}} \times \text{Density}_{\text{HC}}$$

$$(2) \text{ NOx}_{\text{mass}} = K_H \times \sum_{i=1}^n \left[ \frac{(\text{NOx}_e)_i}{10^6} \times (V_{\text{mix}})_i \times \text{Density}_{\text{NO}_2} \times \Delta T \right] \\ - K_H \times \frac{\text{NOx}_d}{10^6} \left( 1 - \frac{1}{\text{DF}} \right) \times V_{\text{mix}} \times \text{Density}_{\text{NO}_2}$$

$$(3) \text{ CO}_{\text{mass}} = \sum_{i=1}^n \left[ \frac{(\text{CO}_e)_i}{10^6} \times (V_{\text{mix}})_i \times \text{Density}_{\text{CO}} \times \Delta T \right] \\ - \frac{\text{CO}_d}{10^6} \left( 1 - \frac{1}{\text{DF}} \right) \times V_{\text{mix}} \times \text{Density}_{\text{CO}}$$

$$(4) \text{ CO}_2_{\text{mass}} = \sum_{i=1}^n \left[ \frac{(\text{CO}_2_e)_i}{10^6} \times (V_{\text{mix}})_i \times \text{Density}_{\text{CO}_2} \times \Delta T \right] \\ - \frac{\text{CO}_2_d}{10^6} \left( 1 - \frac{1}{\text{DF}} \right) \times V_{\text{mix}} \times \text{Density}_{\text{CO}_2}$$

## (d) Meaning of symbols:

(1)(i)  $\text{HC}_{\text{mass}}$  = Hydrocarbon emissions, in grams per test phase.

(ii)  $\text{Density}_{\text{HC}}$  = Density of hydrocarbons = 16.33 g/ft<sup>3</sup> (0.5768 kg/m<sup>3</sup>) for gasoline and the gasoline fraction of methanol-fuel, and may be used for petroleum and the petroleum fraction of methanol diesel fuel if desired, 16.42 g/ft<sup>3</sup> (0.5800 kg/m<sup>3</sup>) for #1 petroleum diesel fuel and 16.27 g/ft<sup>3</sup> (0.5746 kg/m<sup>3</sup>) for #2 diesel, assuming an average carbon to hydrogen ratio of 1:1.85 for gasoline, 1:1.93 for #1 petroleum diesel fuel and 1:1.80 for #2 petroleum diesel fuel at 68 °F (20 °C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $\text{HC}_{\text{conc}}$  = Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent (i.e., equivalent propane  $\times 3$ ).

(B)  $\text{HC}_{\text{conc}} = \text{HC}_e - \text{HC}_d(1 - (1/\text{DF}))$

## Where:

(iv)(A)  $\text{HC}_e$  = Hydrocarbon concentration of the dilute exhaust bag sample or, for diesel continuous heated sampling systems, average hydrocarbon concentration of the dilute exhaust sample as determined from the integrated HC traces, in ppm carbon equivalent. For flow compensated systems  $(\text{HC}_e)_i$  is the instantaneous concentration.

(B) For petroleum-fueled engines,  $\text{HC}_e$  is the FID measurement.

(C) For methanol-fueled engines:

$\text{HC}_e = \text{FID HC}_e - (r)\text{C}_{\text{CH}_3\text{OH}_e}$

(v)  $\text{FID HC}_e$  = Concentration of hydrocarbon plus methanol in dilute exhaust as measured by the FID, ppm carbon equivalent.

(vi)  $r$  = FID response to methanol.

(vii)  $\text{C}_{\text{CH}_3\text{OH}_e}$  = Concentration of methanol in dilute exhaust as

determined from the dilute exhaust methanol sample, ppm carbon.

(viii)(A)  $\text{HC}_d$  = Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.

(B)  $\text{HC}_d = \text{FID HC}_d - (r)\text{C}_{\text{CH}_3\text{OH}_d}$   
(ix)  $\text{FID HC}_d$  = Concentration of hydrocarbon plus methanol in dilution air as measured by the FID, ppm carbon equivalent.

(x)  $\text{C}_{\text{CH}_3\text{OH}_d}$  = Concentration of methanol in dilution air as determined from dilution air methanol sample in ppm carbon.

(2)(i)  $\text{NOx}_{\text{mass}}$  = Oxides of nitrogen emissions, in grams per test phase.

(ii)  $\text{Density}_{\text{NO}_2}$  = Density of oxides of nitrogen is 54.16 g/ft<sup>3</sup> (1.913 kg/m<sup>3</sup>), assuming they are in the form of nitrogen dioxide, at 68 °F (20 °C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $\text{NOx}_{\text{conc}}$  = Oxides of nitrogen concentration of the dilute exhaust

sample corrected for background, in ppm.

(B)  $NO_{xconc} = NO_{xe} - NO_{xd} [1 - (1/DF)]$

Where:

(iv)  $NO_{xe}$  = Oxides of nitrogen concentration of the dilute exhaust bag sample as measured, in ppm. For flow compensated sample systems ( $NO_{xe}$ )<sub>i</sub> is the instantaneous concentration.

(v)  $NO_{xd}$  = Oxides of nitrogen concentration of the dilution air as measured, in ppm.

(3)(i)  $CO_{mass}$  = Carbon monoxide emissions, grams per test phase.

(ii)  $Density_{CO}$  = Density of carbon monoxide is 32.97 g/ft<sup>3</sup> (1.164 kg/m<sup>3</sup>), at

68 °F (20 °C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $CO_{conc}$  = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO<sub>2</sub> extraction, ppm.

(B)  $CO_{conc} = CO_e - CO_d [1 - (1/DF)]$

Where:

(iv)  $CO_e$  = Carbon monoxide concentration of the dilute exhaust bag sample volume corrected for water vapor and carbon dioxide extraction, in ppm. For flow compensated sample systems ( $CO_e$ )<sub>i</sub> is the instantaneous concentration.

(v)(A)  $CO_e = (1 - 0.01925CO_{2e} - 0.000323R)CO_{em}$  for gasoline and petroleum diesel fuel, with hydrogen to carbon ratio of 1.85:1.

(B)  $CO_e = [1 - (0.01 + 0.005HCR)CO_{2e} - 0.000323R]CO_{em}$  for methanol fuel, where HCR is hydrogen to carbon ratio as measured for the fuel used.

Where:

(vi)  $CO_{em}$  = Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.

(vii)(A)  $CO_{2e}$  = Carbon dioxide concentration of the dilute exhaust bag sample, in percent, if measured. For flow compensated sample systems, ( $CO_{2e}$ )<sub>i</sub> is the instantaneous concentration. For cases where exhaust sampling of CO<sub>2</sub> is not performed, the following approximation is permitted:

(B)

$$CO_{2e} = \frac{44.010}{12.011 + (1.008^{\alpha})} \times \frac{M'(453.6)}{Density\ CO_2} \times \frac{100}{V_{mix}}$$

Where:

(C)  $\alpha$  = Average carbon to hydrogen ratio, as specified by the Administrator.

(D)  $M'$  = Fuel mass consumed during the test cycle.

(E)  $R$  = Relative humidity of the dilution air, percent.

(viii)(A)  $CO_d$  = Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.

(B)  $CO_d = (1 - 0.000323R)CO_{dm}$ .

Where:

(ix)  $CO_{dm}$  = Carbon monoxide concentration of the dilution air sample as measured, in ppm.

Note: If a CO instrument which meets the criteria specified in § 86.1311 is used and the

conditioning column has been deleted,  $CO_{em}$  must be substituted directly for  $CO_e$ , and  $CO_{dm}$  must be substituted directly for  $CO_d$ .

(4)(i)  $CO_{2mass}$  = Carbon dioxide emissions, in grams per test phase.

(ii)  $Density\ CO_2$  = Density of carbon dioxide is 51.81 g/ft<sup>3</sup> (1.830 kg/m<sup>3</sup>), at 68 °F (20 °C) and 760 mm Hg (101.3 kPa) pressure.

(iii)  $CO_{2conc}$  = Carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.

(iv)  $CO_{2mass} = CO_{2e} - CO_{2d} [1 - (1/DF)]$ .

Where:

(v)  $CO_{2d}$  = Carbon dioxide concentration of the dilution air as measured, in percent.

(5)(i)  $CH_3OH_{mass}$  = Methanol emissions corrected for background, in grams per test phase.

(ii)  $Density\ CH_3OH$  = Density of methanol is 37.71 g/ft<sup>3</sup> (1.332 kg/m<sup>3</sup>), at 68 °F (20 °C) and 760 mm Hg (101.3 kPa) pressure.

(iii)(A)  $CH_3OH_{conc}$  = Methanol concentration of the dilute exhaust corrected for background, in ppm.

(B)  $CH_3OH_{conc} = C_{CH_3OH_e} - C_{CH_3OH_d} [1 - (1/DF)]$ .

Where:

(iv)(A)  $C_{CH_3OH_e}$  = Methanol concentration in the dilute exhaust, in ppm.

(B)

$$C_{CH_3OH_e} = \frac{3.813 \times 10^{-2} \times C_{CH_3OH_R} \times T_{EM} [(A_{S1} \times AV_{S1}) + (A_{S2} \times AV_{S2})]}{A_{CH_3OH_R} \times P_B \times V_{EM}}$$

(v)(A)  $C_{CH_3OH_d}$  = Methanol concentration in the dilution air, in ppm.

$$(B) C_{CH_3OH_d} = \frac{3.813 \times 10^{-2} \times C_{CH_3OH_R} \times T_{DM} [(A_{D1} \times AV_{D1}) + (A_{D2} \times AV_{D2})]}{A_{CH_3OH_R} \times P_B \times V_{DM}}$$

(vi)  $C_{CH_3OH_R}$  = Concentration of methanol in standard sample for calibration of GC, µg/ml.

(vii)  $A_{CH_3OH_R}$  = GC peak area of standard sample.

(viii)  $T_{EM}$  = Temperature of methanol sample withdrawn from dilute exhaust, °R.

(ix)  $T_{DM}$  = Temperature of methanol sample withdrawn from dilution air, °R.

(x)  $P_B$  = Barometric pressure during test, mm Hg.

(xi)  $V_{EM}$  = Volume of methanol sample withdrawn from dilute exhaust, ft<sup>3</sup>.

(xii)  $V_{DM}$  = Volume of methanol sample withdrawn from dilution air, ft<sup>3</sup>.

(xiii)  $A_S$  = GC peak area of sample drawn from dilute exhaust.

(xiv)  $A_D$  = GC peak area of sample drawn from dilution air.

(xv)  $AV_S$  = Volume of absorbing reagent (deionized water) in impinger through which methanol sample from dilute exhaust is drawn, ml.

(xvi)  $AV_D$  = Volume of absorbing reagent (deionized water) in impinger

through which methanol sample from dilution air is drawn, ml.

(xvii) 1 = first impinger.

(xviii) 2 = second impinger.

(6)(i)  $HCHO_{mbas}$  = Formaldehyde emissions corrected for background, grams per test phase.

(ii)  $Density_{HCHO}$  = Density of formaldehyde is 35.36 g/ft<sup>3</sup> (1.249 kg/m<sup>3</sup>), at 68 °F (20 °C) and 760 mmHg (101.3 kPa) pressure.

(iii)(A)  $HCHO_{conc}$  = Formaldehyde concentration of the dilute exhaust corrected for background, ppm.

(B)  $HCHO_{conc} = C_{HCHO_e} - C_{HCHO_d} [1 - (1/DF)]$ .

Where:

(iv)(A)  $C_{HCHO_e}$  = Formaldehyde concentration in dilute exhaust, ppm.

(B)

$$C_{HCHO_e} = \frac{4.069 \times 10^{-2} \times C_{FDE} \times V_{AE} \times Q \times T_{EF}}{V_{SE} \times P_B}$$

(v)(A)  $C_{HCHO_d}$  = Formaldehyde concentration in dilution air, ppm.

$$(B) C_{HCHO_d} = \frac{4.069 \times 10^{-2} \times C_{FDA} \times V_{AA} \times Q \times T_{DF}}{V_{SA} \times P_B}$$

(vi)  $C_{FDE}$  = Concentration of DNPH derivative of formaldehyde from dilute exhaust sample in sampling solution, µg/ml.

(vii)  $V_{AE}$  = Volume of sampling solution for dilute exhaust formaldehyde sample, ml.

(viii)(A)  $Q$  = Ratio of molecular weights of formaldehyde to its DNPH derivative.

(B)  $Q = 0.1429$ .

(ix)  $T_{EF}$  = Temperature of formaldehyde sample withdrawn from dilute exhaust, °R.

(x)  $V_{SE}$  = Volume of formaldehyde sample withdrawn from dilute exhaust, ft<sup>3</sup>.

(xi)  $P_B$  = Barometric pressure during test, mm Hg.

(xii)  $C_{FDA}$  = Concentration of DNPH derivative of formaldehyde from dilution air sample in sampling solution, µg/ml.

(xiii)  $V_{AA}$  = Volume of sampling solution for dilution air formaldehyde sample, ml.

(xiv)  $T_{DF}$  = Temperature of formaldehyde sample withdrawn from dilution air, °R.

(xv)  $V_{SA}$  = Volume of formaldehyde sample withdrawn from dilution air, ft<sup>3</sup>.

(7)(i)  $DF = 13.4 / [CO_{2e} + (HC_e + CO_e) 10^{-4}]$  for petroleum-fueled vehicles, or  $DF = 13.4 / CO_{2e}$

$$(ii) DF = \frac{100 \times \left( \frac{x}{x + y/2 + 3.76(x + y/4 - z/2)} \right)}{CO_{2e} + (HC_e + CO_e + CH_3OH_e) 10^{-4}}$$

for methanol-fueled vehicles, where fuel composition is  $C_xH_yO_z$  as measured for the fuel used.

(8)(i)  $K_H$  = Humidity correction factor.

(ii) For gasoline-fueled and methanol-fueled diesel engines:  $K_H = 1 / [1 - 0.0047(H - 75)]$  (or for SI units,  $K_H = 1 / [1 - 0.0329(H - 10.71)]$ ).

(iii) For petroleum-fueled and methanol-fueled diesel engines:  $K_H = 1 / [1 - 0.0026(H - 75)]$  (or for SI units =  $1 / [1 - 0.0182(H - 10.71)]$ ).

Where:

(iv)(A)  $H$  = Absolute humidity of the engine intake air in grains (grams) of water per pound (kilogram) of dry air.

(B)(7)  $H = [(43.478)R_i \times P_d] / [P_B - (P_d \times R_i / 100)]$

(2) For SI units,

$H = [(6.211)R_i \times P_d] / [P_B - (P_d \times R_i / 100)]$

(C)  $R_i$  = Relative humidity of the engine intake air, percent.

(D)  $P_d$  = Saturated vapor pressure, in mm Hg (kPa) at the engine intake air dry bulb temperature.

(E)  $P_B$  = Barometric pressure, in mm Hg (kPa).

(9)(i)  $V_{mix}$  = Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528 °R) (293 °K) and 760 mm Hg (101.3 kPa).

(ii)  $(V_{mix})_i$  = Instantaneous dilute exhaust volumetric flow rate (for compensated flow systems), ft<sup>3</sup>/sec.

(iii)  $T$  = Time interval (seconds) between samples in flow compensated systems.

(iv)  $T$  = Total sampling time (seconds).

(v) For PDP-CVS:

(A)

$$V_{mix} = V_o \times \left( \frac{N(P_B - P_d)(528)}{(760)(T_p)} \right)$$

(B) For SI units,



$$V_{mix} = V_o \times \left( \frac{N(P_b - P_s)(293)}{(101.3)(T_p)} \right)$$

Where:

(vi)  $V_o$  = Volume of gas pumped by the positive displacement pump, in cubic feet (cubic meters) per revolution. This volume is dependent on the pressure differential across the positive displacement pump.

(vii)  $N$  = Number of revolutions of the positive displacement pump during the test phase while samples are being collected.

(viii)  $P_b$  = Barometric pressure, mm Hg (kPa).

(ix)  $P_s$  = Pressure depression below atmospheric measured at the inlet to the positive displacement pump, in mm Hg (kPa) (during an idle mode).

(x)  $T_p$  = Average temperature of dilute exhaust entering positive displacement pump during test, °R (°K).

(e) Sample calculation of mass values of exhaust emissions:

(1) Assume the following test results for a gasoline engine:

	Cold start cycle test results	Hot start cycle test results
$V_{mix}$	6924 ft <sup>3</sup>	6873 ft <sup>3</sup>
$R$	30.2 percent	30.2 percent
$R_i$	30.2 percent	30.2 percent
$P_b$	735 mm Hg	735 mm Hg
$P_s$	22.676 mm Hg	22.676 mm Hg
$HC_c$	132.07 ppm C	86.13 ppm C
	equiv.	equiv.
$NO_x$	7.86 ppm	10.98 ppm
$CO_{conc}$	171.22 ppm	114.28 ppm
$CO_2$	0.178 percent	0.381 percent
$HC_d$	3.60 ppm C equiv.	8.70 ppm C
	equiv.	equiv.
$NO_d$	0.0 ppm	0.10 ppm
$CO_{dil}$	0.89 ppm	0.89 ppm
$CO_{2d}$	0.0 percent	0.038 percent
BHP-hr	0.259	0.347

Then:

(2) Cold Start Test:

- (i)  $H = \frac{[43.478](30.2)[22.676]}{[735 - (22.676)(30.2)/100]}$   
= 41 grains of water per pound of dry air.
- (ii)  $K_H = 1/[1 - 0.0047(41 - 75)] = 0.862$
- (iii)  $CO_c = 10.0 \text{ grams/BHP-hr}$

$$= [1 - 0.01925(.178) - 0.000323(30.2)]171.22 = 169.0 \text{ ppm}$$

$$(iv) CO_d = [1 - 0.000323(30.2)]0.89 = 0.881 \text{ ppm}$$

$$(v) DF = 13.4/[178 + (132.07 + 169.0)(10^{-4})] = 64.390$$

$$(vi) HC_{conc} = 132.07 - 3.6[1 - (1/64.390)] = 128.5 \text{ ppm}$$

$$(vii) HC_{mass} = 6924(16.33)(128.5/10^6) = 14.53 \text{ grams}$$

$$(viii) NO_{xconc} = 7.86 - 0.0[1 - (1/64.390)] = 7.86 \text{ ppm}$$

$$(ix) NO_{xmass} = 6924(54.16)(.862)(7.86/10^6) = 2.54 \text{ grams}$$

$$(x) CO_{conc} = 169.0 - .881[1 - (1/64.390)] = 168.0 \text{ ppm}$$

$$(xi) CO_{mass} = 6924(32.97)(168.0/10^6) = 38.35 \text{ grams}$$

$$(xii) CO_{2conc} = .178 - 0[1 - 1/64.390] = 0.178\%$$

$$(xiii) CO_{2mass} = 6924(51.81)(.178/100) = 639 \text{ grams}$$

(3) Hot start test: Similar calculations result in the following:

- (i)  $HC_{mass} = 8.72 \text{ grams}$
- (ii)  $NO_{xmass} = 3.49 \text{ grams}$
- (iii)  $CO_{mass} = 25.70 \text{ grams}$
- (iv)  $CO_{2mass} = 1226 \text{ grams}$

(4) Weighted mass emission results:

- (i)  $HC_{wm} = \frac{1/7(14.53) + 6/7(8.72)}{1/7(0.259) + 6/7(0.347)} = 28.6 \text{ grams/BHP-hr}$
- (ii)  $NO_{xwm} = \frac{1/7(2.54) + 6/7(3.49)}{1/7(0.259) + 6/7(0.347)} = 10.0 \text{ grams/BHP-hr}$

(iii)  $CO_{wm} = \frac{1/7(38.35) + 6/7(25.70)}{1/7(0.259) + 6/7(0.347)} = 82.2 \text{ grams/BHP-hr}$

(iv)  $CO_{2wm} = \frac{1/7(639) + 6/7(1226)}{1/7(0.259) + 6/7(0.347)} = 3415 \text{ grams/BHP-hr}$

(f) The final reported brake-specific fuel consumption (BSFC) shall be computed by use of the following formula:

$$BSFC = \frac{1/7(M_c) + 6/7(M_h)}{1/7(BHP - hr_c) + 6/7(BHP - hr_h)}$$

Where:

- (1) BSFC = brake-specific fuel consumption in pounds of fuel per brake horsepower-hour (lbs/BHP-hr).
- (2)  $M_c$  = mass of fuel, in lbs, used by the engine during the cold start test.
- (3)  $M_h$  = mass of fuel, in lbs, used by the engine during the hot start test.
- (4)  $BHP-hr_c$  = total brake horsepower-hours (brake horsepower integrated with respect to time) for the cold start test.
- (5)  $BHP-hr_h$  = total brake horsepower-hours (brake horsepower integrated with respect to time) for the hot start test.

(g)(1) The mass of fuel for the cold start and hot start test is determined from mass fuel flow measurements made during the tests, or from the following equation:

$$M = (G_s/R_2)(1/453.6)$$

(2) Meaning of symbols:

- (i)  $M$  = Mass of fuel, in lbs, used by the engine during the cold or hot start test.
- (ii)  $G_s$  = Grams of carbon measured during the cold or hot start test:

$$G_s = \left[ \frac{12.011}{12.011 + \epsilon(1.008)} \right] HC_{mass} + 0.429CO_{mass} + 0.273CO_{2mass}$$

Where:

(iii)  $HC_{mass}$  = Hydrocarbon emissions, in grams, for cold or hot start test.

(iv)  $CO_{mass}$  = Carbon monoxide emissions, in grams, for cold or hot start test.

(v)  $CO_{2mass}$  = Carbon dioxide emissions, in grams, for cold or hot start test.

(vi)  $\alpha$  = The atomic hydrogen to carbon ratio of the fuel.  
 (vii)(A)  $R_2$  = The grams of carbon in the fuel per gram of fuel.  
 (B)  $R_2 = 12.011 / [12.011 + \alpha(1.008)]$   
 (h) Sample calculation of brake-specific fuel consumption:  
 (1) Assume the following test results:

	Cold start cycle test results	Hot start cycle test results
BHP-hr.....	6.945	7.078
$\alpha$ .....	1.85	1.85

	Cold start cycle test results	Hot start cycle test results
HC <sub>max</sub> (grams).....	37.08	28.82
CO <sub>max</sub> (grams).....	357.69	350.33
CO <sub>2max</sub> (grams).....	5,419.62	5,361.32

Then:  
 (i)  $G_s$  for cold start test =  $[12.011 / (12.011 + (1.008)(1.85))](37.08) + 0.429(357.69) + 0.273(5419.62) = 1665.10$  grams  
 (ii)  $G_s$  for hot start test =  $[12.011 / (12.011 + (1.008)(1.85))](28.82) +$

$0.429(350.33) + 0.273(5361.32) = 1638.88$  grams  
 (iii)  $R_2 = 12.011 / [12.011 + (1.008)1.85] = 0.866$   
 (iv)(A)  $M_c = (1665.10 / .866)(1 / 453.6) = 4.24$  lbs (calculated), or  
 (B) = 4.24 lbs (directly measured).  
 (v)(A)  $M_H = (1638.88 / .866)(1 / 453.6) = 4.17$  lbs (calculated), or  
 (B) = 4.17 lbs (directly measured).  
 (2) Brake-specific fuel consumption results:

$$BSFC = \frac{(1/7)(4.24) + (6/7)(4.17)}{(1/7)(6.945) + (6/7)(7.078)} = 0.592 \text{ lbs of fuel/BHP-hr}$$

(i) For dilute sampling systems which require conversion of as-measured dry concentrations to wet concentrations, the following equation shall be used for any combination of bagged, continuous, or fuel mass-approximated sample measurements (except for CO measurements made through conditioning columns, as explained in paragraph (d)(3) of this section):

Wet concentration =  $K_w \times$  dry concentration.

Where:

(ii)(A)

$$K_w = 1 - .00925CO_{2e}(\prime) - \frac{1.608 \times H'}{7000 + H'}$$

(B) For SI units,

$$K_w = 1 - .00925CO_{2e}(\prime) - \frac{1.608 \times H'}{1000 + H'}$$

(iii)  $CO_{2e}(\prime)$  = either  $CO_{2e}$  or  $CO_{2e}(\prime)$  as applicable.

(iv)(A)  $H'$  = Absolute humidity of the CVS dilution air, in grains (grams) of water per lb (kg) of dry air.

(B)  $H' = [(43.478)R_i' \times P_d'] / [P_B - (P_d' \times R_i' / 100)]$

(C) For SI units,

$$H' = [(6.211)R_i' \times P_d'] / [P_B - (P_d' \times R_i' / 100)]$$

(v)  $R_i'$  = Relative humidity of the CVS dilution air, in percent.

(vi)  $P_d$  = Saturated vapor pressure, in mm Hg (kPa) at the ambient dry bulb temperature of the CVS dilution air.

(vii)  $P_B$  = Barometric pressure, mm Hg (kPa).

123. Section 86.1343-88 of Subpart N is amended by revising the heading of the section, to read as follows:

**§ 86.1343-88 Calculations; particulate exhaust emissions.**

124. A new § 86.1344-90 is added to Subpart N, to read as follows:

**§ 86.1344-90 Required information.**

(a) The required test data shall be grouped into the following three general categories:

(1) *Engine set up and descriptive data.* These data must be provided to the EPA supervisor of engine testing for each engine sent to the Administrator for confirmatory testing prior to the initiation of engine set-up. These data are necessary to ensure that EPA test personnel have the correct data in order to set up and test the engine in a timely and proper manner. These data are not required for tests performed by the manufacturers.

(2) *Pre-test data.* These data are general test data that must be recorded for each test. The data are of a more descriptive nature such as identification of the test engine, test site number, etc. As such, these data can be recorded at any time within 24 hours of the test.

(3) *Test data.* These data are physical test data that must be recorded at the time of testing.

(b) When requested, data shall be supplied in the format specified by the Administrator.

(c) *Engine set-up data.* Because specific test facilities may change with time, the specific data parameters and number of items may vary. The Application Format for Certification for the applicable model year will specify the exact requirements. In general, the following types of data will be required:

- (1) Engine manufacturer.
- (2) Engine system combination.
- (3) Engine code and CID.
- (4) Engine identification number.
- (5) Applicable engine model year.
- (6) Engine fuel type.
- (7) Recommended oil type.
- (8) Exhaust pipe configuration, pipe sizes, etc.
- (9) Curb or low idle speed.
- (10) Dynamometer idle speed. (Automatic transmission engines only.)
- (11) Engine parameter specifications such as spark timing, operating temperature, advance curves, etc.
- (12) Engine performance data, such as maximum BHP, previously measured rated rpm, fuel consumption, governed speed, etc.
- (13) Recommended start-up procedure.
- (14) Maximum safe engine operating speed.
- (15) Number of hours of operation accumulated on engine.
- (16) Manufacturer's recommended inlet depression limit and typical in-use inlet depression level.
- (17) Exhaust system:
  - (i) *Petroleum-fueled and methanol-fueled diesel engines:*
    - (A) Header pipe inside diameter.
    - (B) Tailpipe inside diameter.
    - (C) Minimum distance in-use between the exhaust manifold flange and the exit of the chassis exhaust system.
    - (D) Manufacturer's recommended maximum exhaust backpressure limit for the engine.
    - (E) Typical backpressure, as determined by typical application of the engine.
    - (F) Minimum backpressure required to meet applicable noise regulations.
  - (ii) *Gasoline-fueled and methanol-fueled Otto-cycle engines:* Typical in-

use backpressure in vehicle exhaust system.

(d) *Pre-test data.* The following data shall be recorded, and reported to the Administrator for each test conducted for compliance with the provisions of CFR Part 86, Subpart A:

(1) Engine-system combination.  
 (2) Engine identification.  
 (3) Instrument operator(s).  
 (4) Engine operator(s).  
 (5) Number of hours of operation accumulated on the engine prior to beginning the test sequence (Figure N84-10).

(6) Identification and specifications of test fuel used.

(7) Date of most recent analytical assembly calibration.

(8) All pertinent instrument information such as tuning, gain, serial numbers, detector number, calibration curve number, etc. As long as this information is traceable, it may be summarized by system or analyzer identification numbers.

(e) *Test data.* The physical parameters necessary to compute the test results and ensure accuracy of the results shall be recorded for each test conducted for compliance with the provisions of 40 CFR Part 86, Subpart A. Additional test data may be recorded at the discretion of the manufacturer. Extreme details of the test measurements such as analyzer chart deflections will generally not be required on a routine basis to be reported to the Administrator for each test, unless a dispute about the accuracy of the data arises. The following types of data shall be required to be reported to the Administrator. The Application Format for Certification for the applicable model year will specify the exact requirements which may change slightly from year to year with the addition or deletion of certain items.

(1) Date and time of day.  
 (2) Test number.  
 (3) Engine intake air or test cell temperature.

(4) Barometric pressure. (A central laboratory barometer may be used: *Provided*, that individual test cell barometric pressures are shown to be within  $\pm 0.1$  percent of the barometric pressure at the central barometer location.)

(5) Engine intake or test cell and CVS dilution air humidity.

(6) Maximum torque versus speed curve as determined in § 86.1332, with minimum and maximum engine speeds, and a description of the mapping technique used.

(7) Measured maximum horsepower and maximum torque speeds.

(8) Measured maximum horsepower and torque.

(9) Measured high idle engine speed (governed petroleum-fueled and methanol-fueled diesel engines only).

(10) Measured fuel consumption at maximum power and torque (petroleum-fueled and methanol-fueled diesel engines only).

(11) Cold-soak time interval and cool down procedures.

(12) Temperature set point of the heated continuous analysis system components (if applicable).

(13) Test cycle validation statistics as specified in § 86.1341 for each test phase (cold and hot).

(14) Total CVS flow rate with dilution factor for each test phase (cold and hot).

(15) Temperature of the dilute exhaust mixture and secondary dilution air (in the case of a double dilution system) at the inlet to the respective gas meter(s) or flow instrumentation used for particulate sampling.

(16) The maximum temperature of the dilute exhaust mixture immediately ahead of the particulate filter.

(17) Sample concentrations (background corrected) for HC, CO, CO<sub>2</sub>, and NO<sub>x</sub> for each test phase (cold and hot).

(18) *For methanol-fueled vehicles:*

(i) Volume of sample passed through the methanol sampling system and the volume of deionized water in each impinger.

(ii) The methanol concentration in the reference sample and the peak area from the GC analysis of the reference sample.

(iii) The peak area of the GC analyses of the test samples (methanol).

(iv) Volume of sample passed through the formaldehyde sampling system.

(v) The formaldehyde concentration in the reference sample and the peak area from the LC analysis of the reference sample.

(vi) The peak area of the LC analysis of the test sample (formaldehyde).

(vii) Specification of the methanol-fuel used during testing.

(19) The stabilized pre-test weight and post-test weight of each particulate sample and back-up filter or pair of filters.

(20) Brake specific emissions (g/BHP-hr) for HC, CO, NO<sub>x</sub> and, if applicable, OMHC, CH<sub>3</sub>OH and HCHO for methanol-fueled vehicles for each test phase (cold and hot).

(21) The weighted (cold and hot) brake specific emissions (g/BHP-hr) for the total test.

(22) The weighted (cold and hot) carbon balance or mass-measured brake specific fuel consumption for the total test.

(23) The number of hours of operation accumulated on the engine after

completing the test sequences described in Figure N84-10.

125. The heading of Subpart P is revised, to read as follows:

**Subpart P—Emission Regulations for New Gasoline-Fueled and Methanol-Fueled Otto-Cycle Heavy-Duty Engines and New Gasoline-Fueled and Methanol-Fueled Otto-Cycle Light-Duty Trucks; Idle Test Procedures**

126. A new § 86.1501-90 is added to Subpart P, to read as follows:

**§ 86.1501-90 Scope; applicability.**

This subpart contains gaseous emission idle test procedures for gasoline-fueled and methanol-fueled Otto-cycle heavy-duty engines, and for gasoline-fueled and methanol-fueled Otto-cycle light-duty trucks. It applies to 1990 and later model years.

127. A new § 86.1504-90 is added to Subpart P, to read as follows:

**§ 86.1504-90 Section numbering; construction.**

(a) The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is effective. A section remains effective until superseded.

*Example:* Section 86.1511-84 applies to the 1984 and subsequent model years until superseded. If § 86.1511-85 is promulgated, it would take effect beginning with the 1985 model year. Section 86.1511-83 would apply to model years 1983 and 1984.

(b) A section reference without a model year suffix refers to the section applicable for the appropriate model year.

(c) All provisions in this subpart apply to gasoline-fueled and methanol-fueled Otto-cycle heavy-duty engines, and to gasoline-fueled and methanol-fueled Otto-cycle light-duty trucks.

128. A new § 86.1505-90 is added to Subpart P, to read as follows:

**§ 86.1505-90 Introduction; structure of subpart.**

(a) This subpart describes the equipment and the procedures required to perform idle exhaust emission tests on gasoline-fueled and methanol-fueled Otto-cycle heavy-duty engines, and gasoline-fueled and methanol-fueled Otto-cycle light-duty trucks. Subpart A sets forth the testing requirements, reporting requirements and test intervals necessary to comply with EPA certification procedures.

(b) Four topics are addressed in this subpart. Sections 86.1505 through 86.1515 set forth specifications and

equipment requirement; §§ 86.1516 through 86.1526 discuss calibration methods and frequency; test procedures and data requirements are listed in §§ 86.1527 through 86.1542 and calculation formula are found in § 86.1544.

129. A new § 86.1506-90 is added to Subpart P, to read as follows:

§ 86.1506-90 Equipment required and specifications; overview.

(a) This subpart contains procedures for performing idle exhaust emission tests on gasoline-fueled and methanol-fueled Otto-cycle heavy-duty engines, and gasoline-fueled and methanol-fueled Otto-cycle light-duty trucks. Equipment required and specifications are as follows:

(1) Exhaust emission tests. All engines and vehicles subject to this subpart are tested for exhaust emissions. Necessary equipment and specifications appear in §§ 86.1509 through 86.1511.

(2) Fuel and analytical tests. Fuel requirements for idle exhaust emission testing are specified in § 86.1513. Analytical gases are specified in § 86.1514.

130. Appendix I of Part 86 is amended by revising paragraphs (f)(1) heading and (f)(3) heading to read as follows:

Appendix I—Urban Dynamometer Schedules

\* \* \* \* \*

(f)(1) EPA Engine Dynamometer Schedules for Heavy-duty Otto-cycle engines.

\* \* \* \* \*

(3) Optional EPA Engine Dynamometer Schedule for Heavy-duty Otto-cycle engines.

\* \* \* \* \*

131. Section 86.091-2 of Subpart A is amended by revising the introductory text to read as follows:

§ 86.091-2 Definitions.

The definitions of § 86.090-2 remain effective. The definitions listed in this section apply beginning with the 1991 model year.

\* \* \* \* \*

132. Section 86.091-9 of Subpart A is amended by revising paragraphs (a)(1), (b), (d), (e), and (g)(2), to read as follows:

§ 86.091-9 Emission standards for 1991 and later model year light-duty trucks.

(a)(1) The standards set forth in paragraphs (a) through (c) of this section shall apply to light-duty trucks sold for principal use at other than a designated high-altitude location. Exhaust emissions from 1991 and later model year light-duty trucks shall not exceed:

(i)(A) Hydrocarbons (for petroleum-fueled Otto-cycle and diesel light-duty

trucks). 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(B) Organic Material Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel light-duty trucks). 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(ii) Carbon monoxide.

(A) 10 grams per vehicle mile (6.2 grams per vehicle kilometer).

(B) 0.50 percent of exhaust gas flow at curb idle (for Otto-cycle and methanol-fueled diesel light-duty trucks only).

(iii) Oxides of nitrogen.

(A) For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 1.2 grams per vehicle mile (0.75 gram per vehicle kilometer).

(B) For light-duty trucks greater loaded vehicle weight, 1.7 grams per vehicle mile (1.1 grams per vehicle kilometer).

(C) A manufacturer may elect to include all or some of its light-duty truck engine families in the NO<sub>x</sub> averaging program, provided that trucks produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas.

Petroleum-fueled and methanol-fueled engine families may not be averaged together. Otto-cycle and diesel engine families also may not be averaged together. If the manufacturer elects to participate in the NO<sub>x</sub> averaging program, individual family NO<sub>x</sub> emission limits may not exceed 2.3 grams per mile. If the manufacturer elects to average together NO<sub>x</sub> emissions of light-duty trucks subject to the standards of paragraphs (a)(1)(iii)(A) and (a)(1)(iii)(B) of this section, its composite NO<sub>x</sub> standard applies to the combined fleets of light-duty trucks up to and including, and over, 3,750 lbs loaded vehicle weight included in the average and is calculated as defined in § 86.088-2.

(iv) Particulate (for diesel light-duty trucks only).

(A) For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 0.26 gram per vehicle mile (0.16 gram per vehicle kilometer).

(B) For light-duty trucks 3,751 lbs and greater loaded vehicle weight, 0.13 gram per vehicle mile (0.08 gram per vehicle kilometer).

(C) A manufacturer may elect to include all or some of its diesel light-duty truck engine families in the appropriate particulate averaging program (petroleum or methanol), provided that trucks produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas, and that light-duty trucks subject to the standard of paragraph (a)(1)(iv)(B) of this section may be averaged only with other light-duty

trucks subject to the standard of paragraph (a)(1)(iv)(B) of this section. Averaging is not permitted between fuel types. If the manufacturer elects to average both light-duty trucks subject to the standard of paragraph (a)(1)(iv)(A) of this section and light-duty vehicles together in the appropriate particulate averaging program, its composite particulate standard applies to the combined set of light-duty vehicles and light-duty trucks included in the average and is calculated as defined in § 86.088-2.

\* \* \* \* \*

(b) Fuel evaporative emissions from 1991 and later model year light-duty trucks shall not exceed (compliance with these standards is optional for 1991 model year methanol-fueled vehicles):

(1) Hydrocarbons (for gasoline-fueled light-duty trucks). 2.0 grams per test.

(2) Organic Material Hydrocarbon Equivalent (for methanol-fueled light-duty trucks). 2.0 grams per test.

(3) The standards set forth in paragraphs (b) (1) and (2) of this section refer to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

\* \* \* \* \*

(d)(1) Model year 1991 and later light-duty trucks sold for principal use at a designated high-altitude location shall be capable of meeting the following exhaust emission standards when tested under high-altitude conditions:

(i)(A) Hydrocarbons (for petroleum-fueled Otto-cycle and diesel light-duty trucks). 1.0 grams per vehicle mile (0.62 grams per vehicle kilometer).

(B) Organic Material Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel light-duty trucks). 1.0 gram per vehicle mile (0.62 gram per vehicle kilometer).

(ii) Carbon Monoxide.

(A) 14 grams per vehicle mile (8.7 grams per vehicle kilometer).

(B) 0.50 percent of exhaust gas flow at curb idle (for Otto-cycle and methanol-fueled diesel light duty trucks only).

(iii) Oxides of Nitrogen.

(A) For light-duty trucks up to and including 3,750 lbs loaded vehicle weight, 1.2 grams per vehicle mile (0.75 grams per vehicle kilometer).

(B) For light-duty trucks 3,751 lbs and greater loaded vehicle weight, 1.7 grams per vehicle mile (1.1 grams per vehicle kilometer).

(iv) Particulate (for diesel light-duty trucks only).

(A) For light-duty trucks up to and including 3,750 lbs loaded vehicle

weight, 0.26 gram per vehicle mile (0.16 gram per vehicle kilometer).

(B) For light-duty trucks 3,751 lbs and greater loaded vehicle weight, 0.13 gram per vehicle mile (0.08 gram per vehicle kilometer).

(2) The standards set forth in paragraphs (d)(1)(i), (d)(1)(ii)(A), (d)(1)(iii), and (d)(1)(iv) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B of this part and measured and calculated in accordance with those procedures. The standard set forth in paragraph (d)(1)(ii)(B) of this section refers to the exhaust emitted at curb idle and measured and calculated in accordance with the procedures set forth in Subpart P of this part.

(e) Fuel evaporative emissions from 1991 and later model year light-duty trucks sold for principal use at a designated high-altitude location, when tested under high-altitude conditions, shall not exceed:

(1) *Hydrocarbons (for gasoline-fueled light-duty trucks)*. 2.6 grams per test.

(2) *Organic Material Hydrocarbon Equivalent (for methanol-fueled light-duty trucks)*. 2.6 grams per test.

(3) The standards set forth in paragraphs (e) (1) and (2) of this section refer to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

\* \* \* \* \*

(g) \* \* \*

(2) The manufacturer may exempt 1991 and later model year vehicles from compliance with the high-altitude emission standards set forth in paragraphs (d) and (e) of this section if the vehicles are not intended for sale at high altitude and if the following requirements are met. A vehicle configuration shall only be considered eligible for exemption if the requirements of either paragraph (g)(2) (i), (ii), (iii), or (iv) of this section are met.

\* \* \* \* \*

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1989  
April 11  
1989

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Tuesday  
April 11, 1989

**Part III**

**The President**

**Proclamation 5951—National Former  
Prisoners of War Recognition Day, 1989**





# Presidential Documents

Title 3—

Proclamation 5951 of April 7, 1989

The President

National Former Prisoners of War Recognition Day, 1989

By the President of the United States of America

## A Proclamation

Since the Revolutionary War, generations of Americans have been willing to make great sacrifices in order to win and preserve our Nation's freedom. Few Americans could appreciate that freedom more than those who suffered capture and imprisonment during times of war. Many of these Americans were subject to mistreatment and torture in violation of fundamental standards of morality and the international code of conduct for the treatment of prisoners of war. Some would never survive.

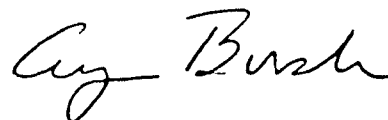
Thousands of Americans captured during World War II and the Korean and Vietnam conflicts endured starvation, disease, and physical and psychological torture, in addition to separation from loved ones. Our Nation must never forget the great price these and other Americans paid so that we might live in peace and freedom.

Today, each and every American should recognize the tremendous debt we owe former prisoners of war. Let us always strive to be worthy of their sacrifices, and let us always be thankful for the blessings of liberty they helped to secure for our country.

The Congress, by Senate Joint Resolution 43, has designated April 9, 1989, as "National Former Prisoners of War Recognition Day" and has authorized and requested the President to issue a proclamation in observance of this occasion.

NOW, THEREFORE, I, GEORGE BUSH, President of the United States of America, do hereby proclaim April 9, 1989, as National Former Prisoners of War Recognition Day, a day dedicated to all American former prisoners of war. I call upon government officials, private organizations and individual Americans to observe this day with appropriate ceremonies and activities, to honor former prisoners of war, and to renew our Nation's appreciation for the rights and freedom they defended. I also invite national and local veterans organizations and civic groups to join in the observance of this day.

IN WITNESS WHEREOF, I have hereunto set my hand this seventh day of April, in the year of our Lord nineteen hundred and eighty-nine, and of the Independence of the United States of America the two hundred and thirteenth.





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Tuesday, April 11, 1989

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