



Offshore Oil and Gas Drilling: Blowout Preventer Systems

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AUSTRALIA

OFFSHORE OIL AND GAS DRILLING: BLOWOUT PREVENTER SYSTEMS

I. Federal Legislation and Regulations

At the Commonwealth of Australia (federal) level, the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) is stated as being “An Act about petroleum exploration and recovery, and the injection and storage of greenhouse gas substances, in offshore areas, and for other purposes.” The Act applies to facilities operating in Commonwealth waters only, being those areas beyond three nautical miles from the baseline of the territorial sea. The legislation is *available at* <http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/C6672EC2444B2894CA2576F6000032F4?OpenDocument>. Schedule 3 of the legislation establishes the occupational health and safety regime for facilities located in Commonwealth waters.

New safety regulations, the Offshore Petroleum (Safety) Regulations 2009 (Cth), have been promulgated under this legislation. The regulations came into effect on January 1, 2010, and are *available at* <http://www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/467E754ACD6EF9E6CA2576860006D5F6?OpenDocument>.

The regulations require each facility to have a “safety case” that includes a facility description, a description of the formal safety assessment that has been conducted, and a detailed description of the safety management system. In addition, the safety case “must specify all Australian and international standards that have been applied, or will be applied, in relation to the facility or plant used on or in connection with the facility for the relevant stage or stages in the life of the facility for which the safety case is submitted.” (*Id.* § 2.7.) The regulations do not specifically refer to requirements relating to BOP systems.

In summary, “the regime under the offshore OHS [occupational health and safety] laws is a performance-based regime where the safe operation of the facility is the responsibility of the operator. It is regulated by a government inspectorate using the safety case as the basis for the operator’s permission to operate.” (National Offshore Petroleum Safety Authority (NOPSA), Offshore OHS Legislative Framework – information paper, *available at* <http://www.nopsa.gov.au/document/Offshore%20OHS%20Legislative%20Framework.pdf>.)

In addition, the Offshore Petroleum (Environment) Regulations 2009 (Cth) require that an “environment plan” be submitted and accepted, including an “oil spill contingency plan” (§ 8AA). The regulations are *available at* <http://www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrumentCompilation1.nsf/current/bytitle/155E3908BB3F2E7BCA257690001104CA?OpenDocument&mostrecent=1>.

Furthermore, the Petroleum (Submerged Lands) (Management of Well Operations) Regulations 2004 (Cth) remain in force despite the repeal and replacement of the Petroleum (Submerged Lands) Act 1967 (Cth) by the 2006 legislation. Under these regulations a “well operations management plan” must be submitted and accepted. A “well” is defined as including “all equipment downhole from a well,” including equipment leading to a blow-out preventer. The regulations are available at <http://www.comlaw.gov.au/ComLaw/legislation/LegislativeInstrument1.nsf/0/C1781DB1F08281F8CA256F70008111D0?OpenDocument>.

The Department of Resources, Energy and Tourism provides information and links to offshore petroleum legislation, regulations and guidance, at http://www.ret.gov.au/resources/upstream_petroleum/offshore_petroleum_regulation_and_legislation/offshore_petroleum_legislation_regulation_and_guidelines/Pages/OffshorePetroleumLegislationRegulationandGuidelines.aspx. This website includes a link to a schedule to the now repealed Petroleum (Submerged Lands) Act 1967, “Schedule of Specific Requirements as to Offshore Petroleum Exploration and Production.” This schedule includes requirements relating to blow-out prevention control in § 505, however it is noted that the schedule is out of date and not referred to in the new legislation or regulations.

II. State Legislation and Regulations

Offshore drilling activities in the waters of the States and of the Northern Territory are governed by a Petroleum (Submerged Lands) Act 1982. This legislation and the associated regulations mirror the regime that applies to Commonwealth waters.

A. Western Australia

- Petroleum (Submerged Lands) Act 1982 (W.A.), available at http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_711_homepage.html.
- Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 2007 (W.A.), available at http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1904_homepage.html.
- Petroleum (Submerged Lands) (Occupational Safety and Health) Regulations 2007 (W.A.), available at http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1899_homepage.html.

B. South Australia

- Petroleum (Submerged Lands) Act 1982, available at [http://www.legislation.sa.gov.au/LZ/C/A/PETROLEUM%20\(SUBMERGED%20LANDS\)%20ACT%201982.a.spx](http://www.legislation.sa.gov.au/LZ/C/A/PETROLEUM%20(SUBMERGED%20LANDS)%20ACT%201982.a.spx).
- Petroleum (Submerged Lands) Regulations 2005, available at [http://www.legislation.sa.gov.au/LZ/C/R/Petroleum%20\(Submerged%20Lands\)%20Regulations%202005.aspx](http://www.legislation.sa.gov.au/LZ/C/R/Petroleum%20(Submerged%20Lands)%20Regulations%202005.aspx).
- In addition, South Australia’s general Occupational Health, Safety and Welfare Regulations 1995 contain specific reference to BOP systems in Division 5.11 (Petroleum work). These regulations are available at <http://www.legislation.sa.gov.au/LZ/C/R/>

[OCCUPATIONAL%20HEALTH%20SAFETY%20AND%20WELFARE%20REGULATIONS%201995.aspx](http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/edfb620cf7503d1aca256da4001b08af/6D3C2CCB18FB08C3CA2576EF001E64F4/$FILE/10-010a.doc).

C. Victoria

- Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic.), *available at* [http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/edfb620cf7503d1aca256da4001b08af/6D3C2CCB18FB08C3CA2576EF001E64F4/\\$FILE/10-010a.doc](http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/edfb620cf7503d1aca256da4001b08af/6D3C2CCB18FB08C3CA2576EF001E64F4/$FILE/10-010a.doc).
- Petroleum (Submerged Lands) Regulations 2004 (Vic.), *available at* [http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/95daf3d8286def33ca256da4001bc4e8/40788E1BE40D0F83CA256F6A0080882E/\\$FILE/04-175SRdoc.doc](http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/95daf3d8286def33ca256da4001bc4e8/40788E1BE40D0F83CA256F6A0080882E/$FILE/04-175SRdoc.doc).

D. Northern Territory

- Petroleum (Submerged Lands) Act 1982 (N.T.), *available at* [http://notes.nt.gov.au/dcm/legislat/legislat.nsf/linkreference/PETROLEUM%20\(SUBMERGED%20LANDS\)%20ACT](http://notes.nt.gov.au/dcm/legislat/legislat.nsf/linkreference/PETROLEUM%20(SUBMERGED%20LANDS)%20ACT).
- Petroleum (Submerged Lands) Regulations (N.T.), *available at* [http://notes.nt.gov.au/dcm/legislat/legislat.nsf/linkreference/PETROLEUM%20\(SUBMERGED%20LANDS\)%20REGULATIONS](http://notes.nt.gov.au/dcm/legislat/legislat.nsf/linkreference/PETROLEUM%20(SUBMERGED%20LANDS)%20REGULATIONS).

III. Oversight and Guidance

The National Offshore Petroleum Safety Authority (NOPSA) is a “Statutory Agency regulating Commonwealth, State and Territory coastal waters with accountability to the relevant Ministers.” NOPSA administers offshore petroleum safety legislation. The NOPSA website provides information about the relevant legislation and regulations at both the Commonwealth and State levels, at <http://www.nopsa.gov.au/regs.asp#ops-regs>.

NOPSA issues guidelines relating to regulatory requirements and best practices. In terms of the content of safety cases, the relevant Guidance Note states that:

For some facilities, compliance with industry standards, codes or practices may play an important role in providing evidence that necessary and appropriate control measures have been identified. In principle, such standards may be Australian Standards, equivalents from overseas organisations, international industry practices such as those from the American Petroleum Institute, or company-specific standards. However, whichever standards are being used, these standards, and the control measures that they apply, should all be shown to be suitable and appropriate to the specific facility, taking account of its type, scale, activities, location, etc.

It is common for an operator to adopt a suite of standards, perhaps taken from a number of different organisations. In such cases, significant effort may be necessary to show that this overall suite of standards is suitable and appropriate, as well as the individual parts.

(NOPSA, Safety Case Content and Level of Detail, GN0106, 3.1.4 (Standards to be Applied), available at <http://www.nopsa.gov.au/document/N-04300-GN0106%20-%20Safety%20Case%20Content%20and%20Level%20of%20Detail.pdf>.)

The Guidance Note refers to BOP systems in the following sections:

- 3.3.6 (Drilling and well intervention operations), which states that the facility description may address different systems as appropriate, including “Surface BOP”;
- 3.3.8 (Lifting Operations), which states that the facility description may cover fixed lifting appliances such as “BOP Cranes”;
- 3.4.1 (Fire and explosion related systems), which states that the safety case may address well control systems, including “blow out preventers.”

NOPSA has recently published a report on its National Programme on Facility Integrity, which was conducted over a three-year period and focused on the “prevention of loss of containment of process petroleum fluids that may arise from failure of offshore topside process equipment, piping, systems and topside structures of production and storage facilities.” (See <http://www.nopsa.gov.au/programmes/>.) The final report is available at <http://www.nopsa.gov.au/programmes/Report%20-%20Facility%20Integrity%20National%20Programme.pdf>.

IV. Montara Commission of Inquiry

On November 5, 2009, a Commission of Inquiry was established to inquire into the “uncontrolled release of oil and gas from the Montara Wellhead Platform in the Timor Sea.” The Commission is due to provide its report to the Minister for Resources and Energy by mid-June 2010. (See website of the Montara Commission of Inquiry, <http://www.montara.inquiry.gov.au/>.)

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NIGERIA

OFFSHORE OIL AND GAS DRILLING: BLOWOUT PREVENTER SYSTEMS

I. Legislation

Various laws regulate the Nigerian oil industry. Among them, the laws relevant to safety measures in offshore drilling appear to be the Petroleum Act (Cap. P10, 13 LAWS OF THE FEDERATION OF NIGERIA (LexisNexis, rev. ed. 2006)), and its subsidiary legislation, the Mineral Oils (Safety) Regulations and Petroleum (Drilling and Production) Regulations. None of these laws specifically address the use of Blowout Preventer (BOP) systems in offshore oil and gas drilling.

With regard to drilling and production operations, section 7 of the Mineral Oils (Safety) Regulations, provide:

Where no specific provision is made by these regulation in respect thereof, all drilling, production, and other operations necessary for the production and subsequent handling of crude oil and natural gas shall conform with good oilfield practice which for the purpose of these Regulations shall be considered to be adequately covered by the appropriate current Institute of Petroleum Safety Codes, the American Petroleum Institute Codes or the American Society of Mechanical Engineers Codes.

Section 37 of the Petroleum (Drilling and Production) Regulations requires a concessionaire to maintain all apparatuses and appliances used in its operations, and all boreholes and wells capable of producing petroleum, in good repair and condition and to carry out all its operations in a proper, workman-like manner as stipulated in the same and other relevant regulations, and pursuant to the methods and practices accepted by the Director of Petroleum Resources as good oil field practice.

The Petroleum Act and its subsidiary legislation, the Mineral Oils (Safety) Regulations, Petroleum Regulations, Petroleum (Drilling and Production) Regulations, Petroleum Refining Regulations, and Crude Oil (Transportation and Shipment) Regulations, are available at the International Center for Nigerian Law (ICFNL) website, <http://www.nigeria-law.org/Petroleum%20Act.htm> (unofficial source).

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NORWAY

OFFSHORE OIL AND GAS DRILLING: BLOWOUT PREVENTER SYSTEMS*

Executive Summary

Norway has experienced one major petroleum blowout incident. Norwegian general regulations on petroleum-related activities prescribe testing of blowout preventers and an overhaul of equipment every five years. Standards on well integrity prescribe in detail the requirements for various types of blowout preventers. Regulations on petroleum exploration in the Svalbard Islands also contain provisions on such equipment.

I. Background

As of January 2008, Norway's continental shelf had seen one serious oil blowout from a facility during the operations phase of petroleum extraction. The incident took place "when a bottom valve in a production well failed in connection with an overhaul (the Ekofisk Bravo accident in 1977)."¹ Although there were no deaths from the accident, 9,000 tons of oil in one week spilled into the sea before operators regained control of the well.²

II. Petroleum Regulations' Provisions on Blowout Preventers

A. Activities Regulations

Norway's 2002 Regulations Relating to Conduct of Activities in the Petroleum Activities (Activities Regulations) govern many aspects of the industry, including health, safety, and environment requirements. Section 48, on "specific requirements to testing of blow out preventer and other pressure control equipment," states:

The blow out preventer [*utblåsingssikringen*] with associated valves and other pressure control equipment on the facility shall be pressure and function tested, cf. [Section 42](#) on maintenance and [Section 44](#) on maintenance programme.

* This report has been prepared on the basis of English-language sources available in the Law Library of Congress and on the Internet.

¹ Petroleum Safety Authority Norway, *Well Control and Well Integrity*, Jan. 29, 2008, <http://www.ptil.no/well-integrity/well-control-and-well-integrity-article4156-145.html>.

² *Id.*

The blow out preventer with associated valves and other pressure control equipment on the facility shall be subjected to a complete overhaul and shall be recertified every five years.^[3]

Guidelines to the Activities Regulations state in regard to Section 48 of those regulations:

In order to fulfil the requirement to testing, complete overhaul and recertification so that the equipment is able to fulfil its intended functions, the [NORSOK D-010](#) standard revision 3 Chapters 4.2.3.4 and 4.2.3.5 plus tables 15.4, 15.14, 15.19, 15.21, 15.32, 15.37, 15.38 and 15.47 and Annex A, Table A.1, plus DNV RP-E101 should be used. See [Section 44](#) on maintenance programme when it comes to this type of equipment used in well intervention and maintenance of sub sea wells.

Complete overhaul and recertification as mentioned in the second paragraph, may be carried out continuously and in a manner which ensures that single components and the whole unit will be overhauled in a rolling five year period.^[4]

NORSOK D-010, Well Integrity in Drilling and Well Operations (Rev. 3, Aug. 2004), provides detailed standards for various types of blowout preventers (BOPs). It is available in English translation on the Petroleum Safety Authority website, at <http://www.standard.no/en/sectors/Petroleum/NORSOK-Standard-Categories/D-Drilling/D-0102/>. (A note on the webpage indicates that ConocoPhillips has “additional requirements to this standard.”) *[Please find attached the above-mentioned relevant sections of D-010, along with other pages from the 158-page document that refer to BOPs.]* Other standards, NORSOK D-001, “Drilling Facilities” (D-001, Rev. 2, July 1998), and NORSOK D-002, “System Requirements Well Intervention Equipment” (D-002, Rev. 1, Oct. 2000), also refer to BOPs.⁵

In addition, two Interpretations of Section 48 were issued: “What About X-Mas Trees?” (Sept. 6, 2002) and “AOC and Applications for Exemption-Operator or Contractor?” (Feb. 15, 2005). The texts are only available in Norwegian, however.⁶ Christmas tree valves are “[a]n

³ Regulations Relating to Conduct of Activities in the Petroleum Activities § 48, *in force from* Jan. 1, 2002, *available at* the Norway Petroleum Safety Authority website, <http://www.ptil.no/activities/category399.html>.

⁴ Guidelines to Regulations Relating to Conduct of Activities in the Petroleum Activities (The Activities Regulations), Re Section 48, Jan. 1, 2002 (updated Apr. 29, 2010), *available at* the Norway Petroleum Safety Authority website, <http://www.ptil.no/activities/category404.html>. The Guidelines are not legally binding.

⁵ Both standards are found in English translation on the Norway Petroleum Safety Authority website, *at* <http://www.standard.no/en/sectors/Petroleum/NORSOK-Standard-Categories/D-Drilling/D-001/> & <http://www.standard.no/PageFiles/1317/D-002.pdf>, respectively.

⁶ Petroleum Safety Authority Norway, (*TIL § 48*) *HVA MED VENTILTRÆR?*, Feb. 14, 2008, <http://www.ptil.no/aktivitetsforskriften/til-48-hva-med-ventiltraer-article3932-388.html>; Norway Petroleum Safety Authority, (*TIL § 48*) *SUT OG SØKNADER OM UNNTAK – OPERATØR ELLER ENTREPRENØR?*, Feb. 14, 2008, <http://www.ptil.no/aktivitetsforskriften/til-48-sut-og-soeknader-om-unntak-operatoer-eller-entreprenoer-article3935-388.html>.

assembly of valves, spools, pressure gauges and chokes fitted to the wellhead of a completed well to control production.”⁷

B. Facilities Regulations

The 2002 Regulations Relating to Design and Outfitting of Facilities etc. in the Petroleum Activities (The Facilities Regulations) specify in Section 48, on well control equipment, that “[f]loating facilities shall have an alternative activation system for activating critical functions on the blow out preventer for use in the event of evacuation” (para. 2).⁸ Guidelines to this section provide, in part:

In order to fulfil the requirement to design of well control equipment, the [NORSOK D-001](#) standard Chapter 5.10 should be used with the following additions:

- a) the main unit of activation system should be located at a safe distance from the well so as to avoid exposure in the event of an uncontrolled well situation,
- b) it should be possible to activate the blowout preventer from at least three locations on the facility:
 - a) one activation panel at the driller’s position,
 - b) as least one independent activation panel in a safe area,
 - c) the third activation alternative may be activation directly on the main unit,
- c) in the event of well intervention, it should be possible to activate pressure control equipment from at least two locations on the facility, with one activation panel in a safe area.⁹

III. Regulations on Svalbard Islands

Norway also has a set of regulations relating to safe practices in petroleum exploration activities on the Svalbard Islands, entitled Regulations Relating to Safe Practice in Exploration and Exploration Drilling for Petroleum Deposits on Svalbard. Sections 40-44 are on blowout

⁷ Schlumberger, *Oilfield Glossary: Christmas Tree*, <http://www.glossary.oilfield.slb.com/Display.cfm?Term=Christmas%20tree> (last visited May 5, 2010).

⁸ Regulations Relating to Design and Outfitting of Facilities etc. in the Petroleum Activities (The Facilities Regulations) § 48, para. 2, Jan. 1, 2002, *available at* the Norway Petroleum Safety Authority website, <http://www.ptil.no/facilities/category400.html>.

⁹ Guidelines to Regulations Relating to Design and Outfitting of Facilities Etc. in the Petroleum Activities (The Facilities Regulations), Re Section 48, Jan. 1, 2002 (updated Dec. 16, 2009), *available at* the Norway Petroleum Safety Authority website, <http://www.ptil.no/facilities/category405.html>.

prevention and equipment.¹⁰ The Svalbard Islands are an archipelago, constituting the northernmost part of Norway, located about halfway between Norway's mainland and the North Pole, in between the Norwegian Sea, Greenland Sea, Barents Sea, and Arctic Ocean.¹¹

It may be noted that the SINTEF Group, self-described as the largest independent research organisation in Scandinavia, has established the SINTEF Offshore Blowout Database. It is “a comprehensive event database for blowout risk assessment” that “includes information on 573 offshore blowouts/well releases that have occurred world-wide since 1955 [to February 2010] and overall exposure data from the US Gulf of Mexico, Outer Continental Shelf and the North Sea.”¹²

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¹⁰ Regulations Relating to Safe Practice in Exploration and Exploration Drilling for Petroleum Deposits on Svalbard, stipulated by Royal Decree of Mar. 25, 1988, by virtue of Section 4 of Act of July 17, 1925, No. 11, relating to Svalbard (Spitzbergen), *last amended* Dec. 19, 2003, No. 1596, *available at* the Norway Petroleum Safety Authority website, http://www.ptil.no/getfile.php/Regelverket/Svalbardforskriften_e.pdf.

¹¹ CIA, THE WORLD FACTBOOK: SVALBARD, <https://www.cia.gov/library/publications/the-world-factbook/geos/sv.html> (last visited May 5, 2010).

¹² SINTEF, *SINTEF Offshore Blowout Database*, Apr. 16, 2010, <http://www.sintef.no/Home/Technology-and-Society/Safety-Research/Projects/SINTEF-Offshore-Blowout-Database/>.

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UNITED KINGDOM

OFFSHORE OIL AND GAS DRILLING: BLOWOUT PREVENTER SYSTEMS

There are two regulations within the Offshore Installations and Wells (Design and Construction, etc.) Regulations (SI 1996/913) that govern the use of blowout preventer systems in the UK. The regulation that applies to blow out preventer systems does not state the technicalities that should be used in the construction or equipment, it merely provides that suitable control equipment should be provided for and used, specifically:

Before an operation in relation to a well (including the drilling of a well) is begun elsewhere than at a borehole site to which the Borehole Sites and Operations Regulations 1995(a) apply, the well-operator shall ensure that suitable well control equipment is provided for use during such operations to protect against blowouts.^[1]

This regulation applies to any well that is drilled for the purposes of exploring or exploiting natural gas or oil and is from or connected in anyway to an offshore installation located in the territorial waters of Great Britain or in the United Kingdom Continental Shelf. Guidance provided by the Health and Safety Executive for the operation of this regulation notes that it provides a duty on well operators that they can discharge as follows:

Well-operators can make sure they are discharging their duty for ensuring the provision of well control equipment under this regulation, by reviewing the contractor's arrangements. This means taking reasonable steps to make sure that the contractor has the equipment specified for well control (eg checking that the necessary equipment is available at the site, asking the contractor providing equipment to produce evidence that the equipment to be provided is what is needed and is suitable for conditions in the well). If necessary, the well-operator should check that the contractor has suitable policies, procedures and management controls to ensure suitable equipment is supplied.^[2]

In addition to the specific requirements that control equipment is provided to protect against blowouts there is also a general duty of care from the well operator to ensure that the well is properly designed, constructed, equipped, etc. to ensure that "so far as is reasonably practicable there can be no unplanned escape of fluids from the well."³

¹ Offshore Installations and Wells (Design and Construction, etc.) Regulations (SI 1996/913), reg. 17.

² Health and Safety Executive, *A guide to the well aspects of the Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996 Guidance on Regulations*, L84 ¶ 35, available at <http://www.hse.gov.uk/pubns/priced/l84.pdf>.

³ Offshore Installations and Wells (Design and Construction, etc.) Regulations (SI 1996/913), reg. 13.

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