

Draft
*Nova-Scotia Offshore Petroleum
Drilling and Production Regulations*
*Canada-Nova Scotia Offshore Petroleum
Resources Accord Implementation Act*
Draft for Stakeholder Information

May 9, 2008

**DRAFT NOVA SCOTIA OFFSHORE PETROLEUM DRILLING AND
PRODUCTION REGULATIONS**

INTERPRETATION

1. (1) The definitions in this section apply in these Regulations.

“abandoned” in relation to a well, means a well or part of a well that has been permanently plugged. (*abandonné*)

“Act” means the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*. (*Loi*)

“artificial island” means a humanly constructed island to provide a site for the exploration and drilling, or the production, storage, transportation, distribution, measurement, processing or handling of petroleum. (*île artificielle*)

“authorization” means an authorization issued by the Board under paragraph 142(1)(b) of the Act. (*authorization*)

“barrier” means any fluid, plug or seal that prevents petroleum or any other fluid from flowing unintentionally from a formation into another formation, or unintentionally flowing from a well. (*barrière*)

“casing liner” means a casing that

(a) is suspended from a string of casing previously installed in a well; and

(b) does not extend to the wellhead. (*tubage partiel*)

“commingled production” means production of petroleum from more than one pool or zone through a common well-bore or flow line without separate measurement of the production from each pool or zone. (*production mélangée*)

“completed” in relation to a well, means a well that is prepared for production or injection operations. (*achevé*)

“completion interval” means a section within a well that is prepared to permit the

(a) production of fluids from the well;

(b) observation of the performance of a reservoir; or

(c) injection of fluids into the well. (*intervalle de complétion*)

“conductor casing” means the casing that is installed in a well to facilitate drilling of the hole for the surface casing. (*tubage initial*)

“drilling program” means the program for the drilling of one or more wells within a specified area and time using one or more drilling installations and includes any work or activity related to the program. (*programme de forage*)

“environmental protection plan” means the plan submitted to the Board under section 6. (*plan de protection de l'environnement*)

“flow allocation procedure” means the procedure to

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(a) allocate total measured quantities of petroleum and water produced from or injected into a pool or zone back to individual wells in a pool or zone where individual well production or injection is not measured separately; and

(b) allocate production to fields that are using a common storage or processing facility. (*méthode de répartition du débit*)

“flow calculation procedure” means the procedure to be used to convert raw meter output to a measured quantity of petroleum or water. (*méthode de calcul du débit*)

“flow system” means the flow meters, auxiliary equipment attached to the flow meters, fluid sampling devices, production test equipment and the master meter and meter prover used to measure and record the rate and volumes at which fluids are

(a) produced from or injected into a pool;

(b) used as a fuel;

(c) used for artificial lift; or

(d) flared or transferred from a production installation. (*système d'écoulement*)

“formation flow test” means an operation

(a) to induce the flow of formation fluids to the surface of a well to procure reservoir fluid samples and determine reservoir flow characteristics; or

(b) to inject fluids into a formation to evaluate injectivity. (*essai d'écoulement de formation*)

“incident” means

(a) any event that caused, or that under slightly different circumstances would likely have caused

(i) a lost or restricted workday injury,

(ii) death,

(iii) fire or explosion,

(iv) loss of containment of any fluid from a well,

(v) imminent threat to the safety of the installation, or

(vi) pollution;

(b) any event that caused a missing person; or

(c) any event that caused

(i) the impairment of any equipment or system critical to the safety of persons, the installation or support craft, or

(ii) the impairment of equipment critical to environmental protection. (*incident*)

“lost or restricted workday injury” means an injury that prevents an employee from reporting for work or from effectively performing all the duties connected with the employee's regular work on any day subsequent to the day on which the injury occurred whether or not that subsequent day is a working day for that employee. (*blessure entraînant la perte complète ou partielle d'une journée de travail*)

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“minor injury” means an employment injury for which medical treatment or first aid is provided and excludes a lost or restricted workday injury. (*blesure sans gravité*)

“multi-pool well” means a well that is completed in more than one pool. (*puits à gisements multiples*)

“natural environment” means the physical and biological environment. (*milieu naturel*)

“operator” means a person that holds

(a) an operating licence under paragraph 142(1)(a) of the Act; and

(b) an authorization. (*exploitant*)

“physical environmental conditions” means the meteorological, oceanographic and related physical conditions, including ice conditions, that might affect a work or activity that is subject to an authorization. (*conditions environnementales physiques*)

“pollution” means the introduction into the natural environment of any substance or form of energy outside the limits established in the authorization, including spills. (*pollution*)

“production control system” means the system provided to control the operation of, and monitor the status of, equipment for the production of petroleum, and includes the installation and work over control system. (*système de contrôle de la production*)

“production project” means an undertaking for the purpose of developing a production site on, or producing petroleum from, a pool or field, and includes any work or activity related to the undertaking. (*projet de production*)

“recovery” means, in respect of petroleum, the recovery of petroleum under reasonably foreseeable economic and operational conditions. (*récupération*)

“relief well” means a well drilled to assist in controlling a blow-out in an existing well. (*puits de secours*)

“rig release date” means the date on which a rig last conducted well operations. (*date de libération de l'appareil de forage*)

“safety plan” means the plan submitted to the Board under section 6. (*plan concernant la sécurité*)

“seafloor” means the surface of all that portion of land under the sea. (*fond marin*)

“slick line” means a single steel cable used to run tools in a well. (*câble lisse*)

“support craft” means a vessel, vehicle, aircraft, standby vessel or other craft used to provide transportation for or assistance to persons on the site where a work or activity is conducted. (*véhicule de service*)

“surface casing” means the casing installed in a well to a sufficient depth, in a competent formation, to establish well control for the continuation of the drilling operations. (*tubage de surface*)

“suspended” in relation to a well or part of a well, means a well in which drilling or production operations have temporarily ceased. (*suspendu*)

“termination” means the abandonment, completion or suspension of a well. (*cessation*)

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“waste material” means any garbage, refuse, sewage or waste well fluids or any other useless material that is generated during drilling, well or production operations, including used or surplus drilling fluid and drill cuttings and produced water. (*déchets*)

“well approval” means the approval granted by the Board under section 13. (*approbation concernant un puits*)

“well-bore” means the hole drilled by a bit in order to make a well. (*trou de sonde*)

“well control” means the control of the movement of fluids into or from a well. (*contrôle d'un puits*)

“well operation” means the operation of drilling, completion, recompletion, intervention, re-entry, work over, suspension or abandonment of a well. (*travaux relatifs à un puits*)

“well test” means, in respect of a development well to which a development plan applies, a test conducted to measure the rates at which fluids are produced from a well for allocation purposes. (*essai d'un puits*)

“wire line” means a line that is used to run survey instruments or other tools in a well. (*câble*)

“work over” means an operation on a completed well that requires removal of the Christmas tree or the tubing. (*reconditionnement*)

“zone” means any stratum or any sequence of strata that has been designated as such by the Board under section 16. (*couche*)

(2) In these Regulations, “delineation well”, “development well” and “exploratory well” have the same meaning as in subsection 122(1) of the Act.

(3) In these Regulations, “drilling installation”, “drilling rig”, “drill site”, “drilling unit”, “installation”, “production installation”, “production operation”, “production site” and “sub sea production system” have the same meaning as in subsection 2(1) of the *Nova Scotia Offshore Petroleum Installations Regulations*.

(4) The following definitions apply for the purposes of paragraph 142(4)(c) of the Act:

“production facility” means equipment for the production of petroleum located at a production site, including separation, treating and processing facilities, equipment and facilities used in support of production operations, landing areas, heliports, storage areas or tanks and dependent personnel accommodations, but not including any associated platform, artificial island, sub sea production system, drilling equipment or diving system; (*installation de production*) and

“production platform” means a production facility and any associated platform, artificial island, sub sea production system, offshore loading system, drilling equipment, facilities related to marine activities and dependent diving system. (*plate-forme de production*)

(5) For the purpose of section 198.2 of the Act, “installation” has the same meaning as in section 2 of the *Nova Scotia Offshore Petroleum Installations Regulations*.

PART 1
BOARD'S POWERS

Spacing

2. The Board is authorized to make orders respecting the allocation of areas, including the determination of the size of spacing units, and the well production rates for the purpose of drilling for or producing petroleum and to exercise such powers and perform such duties as may be necessary for the management and control of petroleum production.

Names and Designations

3. The Board may give a name, classification or status to any well and may change that name, classification or status.

4. The Board may

- (a) designate a zone for the purposes of these Regulations;
- (b) give a name to a pool or field and may change that name; and
- (c) define the boundaries of a pool, zone or field for the purpose of identifying it.

PART 2

MANAGEMENT SYSTEM, APPLICATION FOR AUTHORIZATION AND WELL APPROVALS

Management System

5. (1) The applicant for an authorization shall develop an effective management system that integrates operations and technical systems with the management of financial and human resources to ensure compliance with the Act and these Regulations.

(2) The management system shall include

- (a) the policies on which the system is based;
- (b) the processes for setting goals for the improvement of safety, environmental protection and waste prevention;
- (c) the processes for identifying hazards and for evaluating and managing the associated risks;
- (d) the processes for ensuring that personnel are trained and competent to perform their duties;
- (e) the processes for ensuring and maintaining the integrity of all facilities, structures, installations, support craft and equipment necessary to ensure safety, environmental protection and waste prevention;

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- (f) the processes for the internal reporting and analyzing of hazards, minor injuries and incidents and for taking corrective actions to prevent their recurrence;
 - (g) the documents containing all management system processes and the processes for making personnel aware of their roles and responsibilities with respect to them;
 - (h) the processes for ensuring that all documents associated with the management system are current, valid and have been approved by the appropriate level of authority;
 - (i) the processes for conducting periodic reviews or audits of the management system and for taking corrective actions if reviews or audits identify areas of non-conformance with the management system and opportunities for improvement;
 - (j) the arrangements for coordinating the management and operations of the proposed work or activity among owners of installations, contractors, the operator and others, as applicable; and
 - (k) the name and position of the executive accountable for the management system and of the person responsible for implementing the management system.
- (3) The management system documentation shall be controlled and set out in a logical and systematic fashion to allow for ease of understanding and efficient implementation.
- (4) The management system shall correspond to the size, nature and complexity of the operations and activities, hazards and risks associated with the operations.

Application for Authorization

- 6.** The application for authorization shall be accompanied by
- (a) a description of the scope of the proposed activities;
 - (b) an execution plan and schedule for undertaking those activities;
 - (c) a safety plan that meets the requirements of section 8;
 - (d) an environmental protection plan that meets the requirements of section 9;
 - (e) information on any planned gas flaring or venting, including the rationale and the estimated rate, quantity and period of the flaring or venting;
 - (f) information on any planned burning of oil, including the rationale and the estimated quantity of oil proposed to be burned;
 - (g) in the case of a drilling installation, a description of the drilling and well control equipment;
 - (h) in the case of a production installation, a description of the process facilities and control system;
 - (i) in the case of a production project, a field data acquisition program that allows sufficient pool pressure measurements, fluid samples, cased hole logs and formation flow tests for a comprehensive assessment of the performance of development wells, pool depletion schemes and the field;
 - (j) contingency and emergency response plans to mitigate the effects of any reasonably foreseeable event that might compromise safety or environmental protection, which shall

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- (i) provide for coordination with any relevant municipal, provincial, territorial or federal emergency response plan, and
 - (ii) in an area where oil is reasonably expected to be encountered, identify the scope and frequency of the field practice exercise of oil spill countermeasures; and
 - (k) a description of the decommissioning and abandonment of the site, including methods for restoration of the site after its abandonment.

7. (1) If the application for authorization covers a production installation, the applicant shall also submit to the Board for its approval the flow system, the flow calculation procedure and the flow allocation procedure that will be used to conduct the measurements referred to in Part 7.

(2) The Board shall approve the flow system, the flow calculation procedure and the flow allocation procedure if the applicant demonstrates that the system and procedures facilitate reasonably accurate measurements and, on a pool or zone basis, the production from and injection into individual wells.

8. The safety plan shall set out the procedures, practices, resources, sequence of key safety-related activities and monitoring necessary to ensure the safety of the proposed work or activity, and shall include

- (a) a summary of and references to the management system that demonstrate how it will be applied to the proposed work or activity and how the duties set out in these Regulations with regard to safety will be fulfilled;
- (b) a summary of the studies undertaken to identify hazards and to evaluate safety risks related to the proposed work or activity;
- (c) a description of the hazards that were identified and the results of the risk evaluation;
- (d) a summary of the means to prevent, reduce or manage safety risks;
- (e) a list of all structures, facilities, equipment and systems critical to safety and a summary of the system in place for their inspection, testing and maintenance;
- (f) a description of the organizational structure for the proposed work or activity and the command structure on the installation, which clearly explains
 - (i) their relationship to each other,
 - (ii) the contact information and position of the person accountable for the safety plan and of the person responsible for implementing the safety plan;
- (g) if the possibility of pack sea ice or drifting icebergs exists at the drill or production site, the measures to address the protection of the installation, including systems for ice detection, surveillance, data collection, reporting, forecasting and, if appropriate, ice avoidance or deflection; and
- (h) the arrangements for monitoring compliance with the safety plan and for measuring performance in relation to its objectives.

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9. The environmental protection plan shall set out the procedures, practices, resources and monitoring necessary to manage hazards to and protect the environment from the proposed work or activity and shall include

- (a) a summary of and references to the management system that demonstrate how it will be applied to the project or activity and how the duties set out in these Regulations with regard to environmental protection will be fulfilled;
- (b) a summary of the studies undertaken to identify environmental hazards and to evaluate environmental risks;
- (c) a summary of the means to avoid, prevent, reduce or manage environmental risks;
- (d) a list of all structures, facilities, equipment and systems critical to environmental protection and a summary of the system in place for their inspection, testing and maintenance;
- (e) a description of the organizational structure for the proposed work or activity and the command structure on the installation, which clearly explains
 - (i) their relationship to each other,
 - (ii) the contact information and position of the person accountable for the environmental protection plan and of the person responsible for implementing it;
- (f) a description of the system for the selection, evaluation and use of chemical substances including process chemicals and drilling fluid ingredients;
- (g) a description of equipment and procedures for the treatment, handling and disposal of waste material;
- (h) a description of all discharge streams and limits for any discharge into the natural environment including any waste material;
 - (i) the system for monitoring compliance with the discharge limits identified in paragraph (h), including the sampling and analytical program to determine if those discharges are within the specified limits; and
 - (j) the arrangements for monitoring compliance with the plan and for measuring performance in relation to its objectives.

Well Approval

10. (1) Subject to subsection (2), the operator that wishes to drill, re-enter, work over, complete or recomplete a well or suspend or abandon a well or part of a well shall obtain a well approval.

(2) A well approval is not necessary to conduct a wire line, slick line or coiled tubing operation through a Christmas tree located above sea level if

- (a) the work does not
 - (i) alter the completion interval, or
 - (ii) adversely affect recovery of petroleum; and

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(b) the equipment, operating procedures and qualified persons exist to conduct the wire line, slick line or coiled tubing operations as set out in the authorization.

11. If the well approval sought is to drill a well, the application shall contain

(a) a detailed description of the drilling program; and

(b) a well data acquisition program that allows for the collection of sufficient cutting and fluid samples, logs, conventional cores, side wall cores, pressure measurements and formation flow tests, analyses and surveys to enable a comprehensive geological and reservoir evaluation to be made.

12. If the well approval sought is to

(a) re-enter, work over, complete or recomplete a well or suspend or abandon a well or part of it, the application shall contain a detailed description of that well, the proposed work or activity and the rationale for conducting it;

(b) suspend a well or part of it, the application shall contain the period within which the suspended well or part of it will be abandoned or completed; and

(c) complete a well, the application shall also contain information that demonstrates that section 47 will be complied with.

13. The Board shall grant the well approval if the operator demonstrates that the work or activity will be conducted safely, without waste and without pollution, in compliance with these regulations.

Suspension and Revocation of a Well Approval

14. (1) The Board may suspend the well approval if

(a) the operator fails to comply with the conditions of the approval and the work cannot be conducted safely, without waste or without pollution;

(b) the safety of the work or activity becomes uncertain because

(i) the level of performance of the installation or service equipment, any ancillary equipment or any support craft is demonstrably less than the level of performance indicated in the application,

(ii) the physical environmental conditions encountered in the area of the activity for which the well approval was granted are more severe than the equipment's operating limits as specified by the manufacturer;

(c) the operator fails to comply with the approvals issued under subsections 7(2), 53(2), 53(4) or 67(2).

(2) The Board may revoke the well approval if the operator fails to remedy the situation causing the suspension within 120 days after the date of that suspension.

Development Plans

15. For the purpose of subsection 143(1) of the Act, the well approval relating to a production project is prescribed.

16. For the purposes of subsection 143(3) of the Act, Part II of the development plan relating to a proposed development of a pool or field shall contain a resource management plan.

PART 3

OPERATOR'S DUTIES

Availability of Documents

17. (1) The operator shall keep a copy of the authorization, the well approval and all other approvals and plans required under these Regulations, the Act and the regulations made under the Act at the installation and shall make them available for examination at the request of any person at the installation.

(2) The operator shall ensure that a copy of all operating manuals and other procedures and documents necessary to execute the work or activity and to operate the installation safely without pollution are readily accessible at each installation.

Management System

18. The operator shall ensure compliance with the management system referred to in section 5 in a manner that ensures its efficient implementation during all operations and activities.

Safety and Environmental Protection

19. The operator shall take all reasonable precautions to ensure safety and environmental protection, including the following:

(a) any operation necessary for the safety of persons at an installation or on a support craft has priority, at all times, over any work or activity at that installation or support craft;

(b) safe working methods are followed during all drilling, well or production operations;

(c) there is a shift hand-over system to effectively communicate any conditions, mechanical or procedural deficiencies or other problems that might have an impact on safety or environmental protection;

(d) differences in language or other barriers to effective communication do not jeopardize safety or environmental protection;

(e) all persons at an installation, or in transit to or from an installation, receive instruction and are familiar with safety and evacuation procedures and with their roles and responsibilities in contingency and emergency response plans;

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- (f) any drilling or well operation is conducted in a manner that maintains full control of the well at all times;
 - (g) if there is loss of control of a well at an installation, all other wells at that installation are shut in until the well that is out of control is secured;
 - (h) plans have been made and equipment is available to deal with all abnormal situations that may be anticipated;
 - (i) all equipment required for safety and environmental protection is available and in an operable condition;
 - (j) the inventory of all equipment identified in the safety plan and the environmental protection plan is updated after the completion of any significant modification or repair to any major component of the equipment;
 - (k) the administrative and logistical support that is provided for drilling, well or production operations includes accommodation, transportation, first aid and storage, repair facilities and communication systems suitable for the area of operations;
 - (l) a sufficient number of trained and competent individuals are available to complete the authorized work or activities and to carry out any work or activity safely and without pollution; and
 - (m) any operational procedure that is unsafe for persons or the environment is corrected and all affected persons are informed of the alteration.

20. (1) No person shall tamper with, activate without cause, or misuse any safety or environmental protection equipment.

(2) A passenger on a helicopter, supply vessel or any other support craft engaged in a drilling program or production project shall comply with all applicable safety instructions.

21. (1) No person shall smoke on an installation except in those areas set aside by the operator for that use.

(2) The operator shall ensure compliance with subsection (1).

Storing and Handling of Consumables

22. The operator shall ensure that fuel, potable water, spill containment, safety-related chemicals, drilling fluid materials, cement and other consumables are

(a) readily available and stored in quantities sufficient for any normal and reasonably foreseeable emergency condition; and

(b) stored and handled in a manner that minimizes their deterioration, ensures safety and prevents pollution.

Handling of Chemical Substances, Waste Material and Oil

23. The operator shall ensure that all chemical substances, including process fluids and diesel fuel, waste material, drilling fluid and drill cuttings generated at an installation are handled in a way that does not create a hazard to safety or the environment.

Cessation of a Work or Activity

24. (1) The operator shall ensure that any work or activity ceases with delay if the continuation of that work or activity

- (a) endangers or is likely to endanger the safety of persons;
- (b) endangers or is likely to endanger the safety or integrity of the well or of the installation; or
- (c) causes or is likely to cause pollution.

(2) If the work or activity ceases, the operator shall ensure that it does not resumed until it can do so safely and without pollution.

PART 4

EQUIPMENT AND OPERATIONS

Wells, Installations, Equipment, Facilities and Support Craft

25. The operator shall ensure that

- (a) all wells, installations, equipment, facilities and support craft are designed, constructed, tested, maintained and operated to prevent incidents, pollution and waste under the maximum load conditions that may be reasonably anticipated during any operation; and
- (b) records of maintenance, tests and inspections are kept.

26. The operator shall ensure that a comprehensive inspection that includes a non-destructive examination of critical joints and structural members of an installation and any critical drilling or production equipment is made at least once in every five-year period and that a report is kept in respect of that inspection.

27. The operator shall ensure that

- (a) the components of an installation and well tubulars, Christmas trees and wellheads are operated in accordance with good engineering practices; and
- (b) any part of an installation that may be exposed to a sour environment is designed, constructed and maintained to operate safely in that environment.

28. The operator shall ensure that any defect in the installation, equipment, facilities and support craft that may be a hazard to safety or the environment is rectified without delay.

Drilling Fluid System

- 29.** The operator shall ensure that
- (a) the drilling fluid system and associated monitoring equipment is designed, installed, operated and maintained to provide an effective barrier against formation pressure, to allow for proper well evaluation, to ensure safe drilling operations and to prevent pollution; and
 - (b) the indicators and alarms associated with the drilling fluid monitoring equipment are strategically located on the drilling rig to alert onsite personnel.

Marine Riser

- 30.** (1) Every marine riser shall be capable of
- (a) furnishing access to the well;
 - (b) isolating the well-bore from the sea;
 - (c) withstanding the differential pressure of the drilling fluid relative to the sea;
 - (d) withstanding the physical forces anticipated in the drilling program; and
 - (e) permitting the drilling fluid to be returned to the installation.
- (2) Every marine riser shall be supported in a manner that effectively compensates for the forces caused by the motion of the installation.

Drilling Practices

- 31.** The operator shall ensure that adequate equipment, procedures and personnel are in place to recognize and control normal and abnormal pressures and allow for safe, controlled drilling operations and to prevent pollution.

Reference for Well Depths

- 32.** The operator shall ensure that any depth in a well is measured from a single reference point that shall be either the kelly bushing or the rotary table of the drilling rig.

Directional and Deviation Surveys

- 33.** The operator shall ensure that
- (a) directional and deviation surveys are taken at intervals that allow the position of the well bore to be determined accurately; and
 - (b) except in the case of a relief well, a well is drilled in a manner that does not intersect an existing well.

Formation Leak-Off Test

34. The operator shall ensure that

- (a) a formation leak-off test or a formation integrity test is conducted before drilling no more than 10 m below the shoe of any casing other than the conductor casing; and
- (b) the formation leak-off test or the formation integrity test is conducted to a value that allows for safe drilling to the next planned casing depth; and
- (c) a record is retained of each formation leak-off test and the results included in the daily drilling report referred to in paragraph 85(a) and in the well history report referred to in section 92.

Formation Flow and Well Testing Equipment

35. (1) The operator shall ensure that

- (a) the equipment used in a formation flow test or a well test is designed to safely control well pressure, properly evaluate the formation and prevent pollution;
- (b) the rated working pressure of formation flow test equipment upstream of and including the well testing manifold exceeds the maximum anticipated shut-in pressure; and
- (c) the equipment downstream of the well testing manifold is sufficiently protected against overpressure.

(2) The operator shall ensure that the formation flow test equipment includes a down hole safety valve that permits closure of the test string above the packer.

(3) The operator shall ensure that any formation flow test equipment used in testing a well that is drilled with a floating drilling unit has a subsea test tree that includes

- (a) a valve that
 - (i) may be operated from the surface,
 - (ii) automatically closes when required to prevent uncontrolled well flow; and
- (b) a release system that permits the test string to be hydraulically or mechanically disconnected within or below the blow-out preventers.

Well Control

36. The operator shall ensure that procedures, materials and equipment are in place and utilized to minimize the risk of loss of well control in the event of lost circulation.

37. (1) The operator shall ensure that during all well operations, reliably operating well control equipment is installed to

- (a) control kicks;
- (b) prevent blow-outs; and
- (c) safely achieve all well activities and operations, including drilling, completion, and work over operations.

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(2) After setting the surface casing, the operator shall ensure that during all well operations, there are at least two independent and tested well barriers in place.

(3) If a barrier fails, the operator shall ensure that no other activities, other than those intended to restore or replace the barrier, take place in the well.

(4) The operator shall ensure that, during drilling, except when drilling under balanced, one of the two barriers to be maintained is the drilling fluid column.

38. The operator shall ensure that pressure control equipment associated with drilling, coil tubing, slick line and wire line operations is pressure tested on installation and as often as necessary to ensure its continued safe operation.

39. If the well control is lost or if safety, environmental protection or resource conservation is at risk, the operator shall ensure that any action necessary to rectify the situation is taken without delay, notwithstanding any condition to the contrary in the well approval.

Casing and Cementing

40. (1) The operator shall ensure that the well and casing are designed so that

(a) the well is drilled safely, the targeted formations are evaluated and waste is prevented;

(b) all anticipated stresses are withstood; and

(c) the integrity of gas hydrate zones is protected.

(2) If the casing is used as a well barrier, the operator shall also ensure that it is designed to prevent uncontrolled flow.

41. The operator shall ensure that the well and casing are installed at a depth that provides for adequate kick tolerances and safe, constant bottom hole pressure well control operations.

42. The operator shall ensure that cement slurry is designed and installed to

(a) prevent the movement of formation fluids in the casing annuli and, where required for safety, resource evaluation or prevention of waste, ensure the isolation of the petroleum and water zones;

(b) provide support for the casing;

(c) retard corrosion of the casing over the cemented interval; and

(d) protect the integrity of gas hydrate zones.

Waiting on Cement Time

43. After the cementing of any casing or casing liner and before drilling out the casing shoe, the operator shall ensure that the cement has reached the minimum compressive strength sufficient to support the casing and provide zonal isolation.

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Casing Pressure Testing

44. After running casing and cementing and before drilling out the casing shoe, the operator shall ensure that the casing is pressure tested to the value required to confirm its integrity for maximum anticipated operating pressure.

Production Tubing

45. The operator shall ensure that the production tubing used in a well is designed to withstand the maximum conditions, forces and stresses that may be placed on it and to maximize recovery from the pool.

Monitoring and Control of Process Operations

46. The operator shall ensure that

(a) operations such as processing, transportation, storage, re-injection and handling of hydrocarbons on the installation are effectively monitored to prevent incidents and waste;

(b) all alarms, safety, monitoring and warning systems associated with those operations are managed to prevent incidents and waste; and

(c) all appropriate persons are informed

(i) of any applicable alarm, safety, monitoring, warning or control system associated with those operations that is taken out of service, and

(ii) when that system is returned to service.

Well Completion

47. (1) The operator that completes a well shall ensure that

(a) it is completed in a safe manner and allows for maximum recovery;

(b) except in the case of commingled production, each completed interval is isolated from any other porous and permeable interval penetrated by the well;

(c) the testing and production of any completed interval are conducted safely and do not cause waste or pollution; and

(d) if applicable, sand production is controlled and does not create a safety hazard or cause waste.

(2) The operator that completes a well shall ensure that

(a) each packer is set as close as practical to the top of the interval to be completed and that the pressure testing of the packer to a differential pressure is greater than the maximum differential pressure anticipated under production or injection conditions.

(b) if practical, any mechanical well condition that may have an adverse effect on production of petroleum from, or the injection of fluids into, the well is corrected.

(c) the injection or production profile of the well is improved, or the completion interval of the well is changed, if it is necessary to do so to prevent waste.

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(d) if different pressure and inflow characteristics of two or more pools might adversely affect recovery of petroleum from any of those pools, the well is operated

- (i) as a single pool well; or
- (ii) as a segregated multi-pool well.

(e) after initial completion, all barriers are tested to the maximum pressure to which they are likely to be subjected; and

(f) following any work over, any affected barriers are pressure tested.

(3) The operator of a segregated multi-pool well shall ensure that

(a) after the well is completed, segregation has been established within and outside the well casing and is confirmed; and

(b) if there is reason to doubt that segregation is being maintained, a segregation test is conducted without delay.

Subsurface Safety Valve

48. The operator of a development well capable of flow shall ensure that the well is equipped with a fail-safe subsurface safety valve that is designed, installed, operated and tested to prevent uncontrolled well flow when it is activated.

Wellhead and Christmas Tree Equipment

49. The operator shall ensure that the wellhead and Christmas tree equipment, including valves, are designed to operate safely and efficiently under the maximum load conditions anticipated during the life of the well.

PART 5

EVALUATION OF WELLS, POOLS AND FIELDS

General

50. The operator shall ensure that the well and field data acquisition programs are implemented in accordance with good oilfield practices.

51. (1) If part of the well or field data acquisition program cannot be implemented, the operator shall ensure that

- (a) a conservation officer is notified as soon as the circumstances permit; and
- (b) the procedures to otherwise achieve the goals of the program are submitted to the Board for approval.

(2) If the operator can demonstrate that those procedures can achieve the goals of the well or field data acquisition program or are all that can be reasonably expected in the circumstances, the Board shall approve them.

Testing and Sampling of Formations

52. The operator shall ensure that every formation in a well is tested and sampled to obtain reservoir pressure data and fluid samples from the formation, if there is an indication that the data or samples would contribute substantially to the geological and reservoir evaluation.

Formation Flow Testing

53. (1) The operator shall ensure that

(a) no development well is put into production unless the Board has approved a formation flow test in respect of the development well.

(b) if a development well is subjected to a well operation that might change its deliverability, productivity or injectivity, a formation flow test is conducted without delay after the well operation is completed to determine the effects of that operation on the well's deliverability, productivity or injectivity.

(2) The operator may conduct a formation flow test on a well drilled on a geological feature if, before conducting that test, the operator

(a) submits to the Board a detailed testing program; and

(b) obtains the approval of the Board to conduct the test.

(3) The Board may require that the operator conduct a formation flow test on a well drilled on a geological feature, other than the first well, if there is an indication that the test would contribute substantially to the geological and reservoir evaluation.

(4) The Board shall approve a formation flow test if the operator demonstrates that the test will be conducted safely, without pollution and in accordance with good oilfield practices and that the test will enable the operator to

(a) obtain data on the deliverability or productivity of the well;

(b) establish the characteristics of the reservoir; and

(c) obtain representative samples of the formation fluids.

Submission of Samples and Data

54. The operator shall ensure that all cutting samples, fluid samples and cores collected as part of the well and field data acquisition programs are

(a) transported and stored in a manner that prevents any loss or deterioration;

(b) delivered to the Board within 60 days after the rig release date unless analyses are ongoing, in which case those samples and cores, or the remaining parts, are to be delivered on completion of the analyses; and

(c) stored in durable containers properly labelled for identification.

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55. The operator shall ensure that after any samples necessary for analysis or for research or academic studies have been removed from a conventional core, the remaining core, or a longitudinal slab that is not less than one half of the cross-sectional area of that core, is submitted to the Board.

56. Before disposing of cutting samples, fluid samples, cores or evaluation data under these Regulations, the operator shall ensure that the Board is notified in writing and is given an opportunity to request delivery of the sample, core or data.

PART 6

WELL TERMINATION

Suspension or Abandonment

57. The operator shall ensure that every well that is abandoned or suspended can be readily located and that it is left in a condition that

- (a) provides for isolation of all hydrocarbon bearing zones and discrete pressure zones, and
- (b) prevents any formation fluid from flowing through or escaping from the well bore.

58. The operator of a suspended well shall ensure that the well is monitored and inspected to maintain its continued integrity and to prevent pollution.

59. The operator shall ensure that, on the abandonment of any well, the seafloor is cleared of any material or equipment that might interfere with other commercial uses of the sea.

Installation Removal

60. No operator shall remove or cause to have removed a drilling installation from a well drilled under these Regulations unless the well has been terminated in accordance with these Regulations.

PART 7

MEASUREMENTS

Flow and Volume

61. (1) Unless otherwise included in the approval issued pursuant to subsection 7(2), the operator shall ensure that the rate of flow and the volume of the following are measured and recorded

- (a) the fluid that is produced from each well;
- (b) the fluid that is injected into each well;
- (c) any produced fluid that is transferred from, flared, disposed of or used on the installation; and
- (d) any produced fluid that enters or leaves a battery, facility, processing plant, or other installation.

(2) The operator shall ensure that any measurements are conducted in accordance with the flow system, flow calculation procedure and flow allocation procedure, approved under subsection 7(2).

62. (1) The operator shall ensure that group production of petroleum from wells and injection of a fluid into wells is allocated on a *pro rata* basis, in accordance with the flow system, flow calculation procedure and flow allocation procedure approved under subsection 7(2).

(2) If a well is completed over multiple pools and zones, the operator shall ensure that prorated production or injection volumes for the well are allocated on a *pro rata* basis to the pools and zones in accordance with the flow allocation procedure approved under subsection 7(2).

Testing, Maintenance and Notification

63. The operator shall ensure that

- (a) meters and associated equipment are calibrated and maintained to ensure their continued accuracy;
- (b) equipment used to calibrate the flow system is calibrated in accordance with good measurement practices;
- (c) any component of the flow system that is not functioning in accordance with manufacturer's specifications is repaired or replaced without delay; and
- (d) a conservation officer is notified, as soon as the circumstances permit, of any malfunction or failure of any flow system component that may have an impact on the accuracy of the flow system and of the corrective measures taken.

Transfer Meters

64. The operator shall ensure that

- (a) a conservation officer is notified at least 14 days before the day on which any transfer meter prover or master meter used in conjunction with a transfer meter is calibrated; and
- (b) a copy of the calibration certificate is submitted to the Chief Conservation Officer as soon as the circumstances permit, following completion of the calibration.

Proration Testing Frequency

65. The operator of a development well that is producing petroleum shall ensure that sufficient well tests are performed to permit reasonably accurate determination of the allocation of petroleum and water production on a pool and zone basis.

PART 8

PRODUCTION CONSERVATION

Resource Management

66. The operator shall ensure that

- (a) maximum recovery of petroleum from a pool is achieved in accordance with good oilfield practices;
- (b) wells are located and operated to provide for maximum recovery of petroleum from a pool; and
- (c) if there is reason to believe that infill drilling or implementation of an enhanced recovery scheme might result in increased recovery of petroleum from a pool or field, studies on these methods are carried out and submitted to the Board.

Commingled Production

67. (1) No operator shall engage in commingled production except in accordance with an approval granted under subsection (2).

(2) The Board shall approve the commingled production if the operator demonstrates that it would not reduce the recovery of petroleum from the pool or zone.

(3) The operator engaging in commingled production shall ensure that the total volume and the rate of production of each fluid produced from each pool or zone is measured in accordance with the requirements of Part 7.

Gas Flaring and Venting

68. No operator shall flare or vent gas unless

- (a) it is otherwise permitted in the authorization or approval issued under subsection 53(4); or
- (b) it is necessary to do so because of an emergency situation and the Board is notified of the amount flared or vented as soon as the circumstances permit.

Oil Burning

69. No operator shall burn oil unless

(a) it is otherwise permitted in the authorization or approval issued under subsection 53(4); or

(b) it is necessary to do so because of an emergency situation and the Board is notified of the burning and the amount burned as soon as the circumstances permit.

PART 9

SUPPORT OPERATIONS

Support Craft

70. The operator shall ensure that all support craft are designed, constructed and maintained to supply the necessary support functions and operate safely in the foreseeable physical environmental conditions prevailing in the vicinity of the installation that the craft is intended to support.

71. (1) The operator of a manned installation shall ensure that at least one support craft is

(a) available at a distance that is not greater than that required for a return time of twenty minutes; and

(b) suitably equipped to supply the necessary emergency services including rescue and first aid treatment for all personnel on the installation in the event of an emergency.

(2) If the support craft exceeds that distance, both the installation manager and the person in charge of the support craft shall log the reason why the distance or time was exceeded.

(3) Under the direction of the installation manager, the support craft crew shall keep the craft in close proximity to the installation, maintain open communication channels with the installation and be prepared to conduct rescue operations during any activity or condition that presents an increased level of risk to the safety of personnel or the installation.

Safety Zone

72. (1) For the purposes of this section, the safety zone around an installation consists of the area within a line enclosing and drawn at a distance of

(a) 500 m from the perimeter of the installation; and

(b) 50 m from the anchor pattern, if any, of the installation.

(2) A support craft shall not enter the safety zone without the consent of the installation manager.

(3) The operator shall take all reasonable measures to warn persons who are in charge of vessels and aircraft and who are not authorized to enter the safety zone, of its boundaries.

PART 10

TRAINING AND COMPETENCY

73. (1) The operator shall ensure that

(a) all personnel shall, before assuming their duties, have the necessary experience, training and qualifications and be able to conduct their duties safely, competently and in compliance with these Regulations; and

(b) records of the experience, training and qualifications of all personnel are maintained and made available to the Board upon request.

Rest Period

74. (1) Subject to subsection (2), the operator shall ensure that no person shall work when their ability to function is impaired and that no person is required to work

(a) any shift in excess of 12.5 continuous hours; or

(b) two successive shifts of any duration unless that person has had at least eight hours rest between the shifts.

(2) The operator may allow a person to work in excess of the hours or without the rest period referred to in subsection (1) if pursuant to the safety plan, the operator has assessed the risk associated with the person working the extra hours and determined that the benefit to the safety of persons or the installation, the protection of the natural environment or the security of the well outweighs that risk.

(3) If an operator allows a person to work in excess of the hours or without the rest period referred to in subsection (1), the operator shall ensure that a description of the work, the names of the persons performing the work, the hours worked and the risk assessment referred to in subsection (2) are recorded.

PART 11

SUBMISSIONS, NOTIFICATIONS, RECORDS AND REPORTS

Reference to Names and Designations

75. When submitting any information for the purposes of these Regulations, the operator shall refer to each well, pool, zone and field by the name given to it or designated by the Board under section 4.

Location Survey

76. (1) The operator shall ensure that a survey is used to confirm the surface location of the well's location on the seafloor.

(2) The survey shall be certified by a person licensed under the Canada Lands Surveyors Act.

(3) The operator shall ensure that a copy of the survey plan filed with the Canada Lands Surveys Records is submitted to the Board.

Incidents

77. (1) The operator shall ensure that

(a) the Board is notified without delay of any incident or spill; and

(b) the Board is notified at least 24 hours in advance of any press release or press conference held by the operator concerning any incident in any activity to which these Regulations apply, except in an emergency situation, when notice shall be given before the press release or press conference.

(2) The operator shall ensure that

(a) each incident is investigated; and

(b) for each lost or restricted workday injury, and for each significant pollution event, including spills or loss of containment or near miss event, a copy of an investigation report identifying root causes, causal factors and corrective actions is submitted to the Board no later than twenty-one days after the day on which the incident occurred.

Submission of Data and Analysis

78. (1) The operator shall ensure that a final copy of the results, data, analyses and schematics obtained from the following sources is submitted to the Board:

(a) any core or fluid sample required under Part 5 or any measurement required under Part 7; and

(b) any segregation test or well operations.

(2) Unless otherwise indicated in these Regulations, the results, data, analyses and schematics shall be submitted within 60 days after the day on which the measurement, core or fluid sampling, test or well operation is completed.

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Records

- 79.** The operator shall ensure that records are kept of
- (a) all persons arriving, leaving or on the installation;
 - (b) the location and movement of support craft, the emergency drills and exercises, pollution events, incidents, the quantities of consumable substances that are required to ensure the safety of operations and other observations and information critical to the safety of persons on the installation or the protection of the environment;
 - (c) daily maintenance and operating activities, including any activity that may be critical to the safety of persons, the protection of the environment or the prevention of waste;
 - (d) in the case of a production installation,
 - (i) the inspection of any installation and related equipment for corrosion and erosion and any resulting maintenance,
 - (ii) the pressure, temperature and flow rate data for compressors, treating facilities and processing equipment,
 - (iii) the calibration of meters and instruments,
 - (iv) the testing of surface safety and subsurface safety valves,
 - (v) the status of each well and the status of well operations,
 - (vi) the status of the equipment and systems critical to safety and protection of the environment including any unsuccessful test result or equipment failure leading to an impairment of the system; and
 - (e) in the case of a floating installation, all installation motions and matters, observations, measurements and calculations related to the stability and station keeping capability of the installation.

Meteorological Observations

- 80.** The operator shall ensure that
- (a) an installation is equipped with facilities and equipment for observing, measuring and recording physical environmental conditions and that a comprehensive record of observations of physical environmental conditions is maintained onboard the installation; and
 - (b) forecasts of meteorological conditions, sea states and ice movements are obtained and recorded each day and each time during the day that they change substantially from those forecasted.

Daily Production Record

81. The operator shall ensure that a daily production record, which includes the metering records and other information relating to the production of petroleum and other fluids in respect of a pool or well, is retained and readily accessible until the field or well in which the pool is located is abandoned and at that time shall offer the record to the Board before destroying it.

Retention of Records

82. (1) Unless otherwise indicated in these Regulations, the operator shall ensure that the records required in these Regulations are kept for 5 years and shall offer the original or a copy of those records to the Board before destroying them.

(2) The operator shall ensure that all records are readily accessible for inspection by the Board.

Formation Flow Test Reports

83. The operator shall ensure that

- (a) a report of formation flow test results is submitted to the Board; and
- (b) a summary formation flow test report is submitted to the Chief Conservation Officer as soon as the circumstances permit, following completion of the test.

Pilot Scheme

84. (1) For the purposes of this section, “pilot scheme” means a scheme that applies existing or experimental technology over a limited portion of a pool to obtain information on reservoir or production performance for the purpose of optimizing field development or improving reservoir or production performance.

(2) The operator shall ensure that interim evaluations of any pilot scheme respecting a pool, field or zone are submitted to the Board.

(3) When the operator completes a pilot scheme, the operator shall submit a report to the Board that sets out

- (a) the results of the scheme and supporting data and analyses; and
- (b) the operator's conclusions as to the potential of the scheme for application to full-scale production.

Daily Reports

85. The operator shall ensure that a copy of the following is submitted to the Board daily:

- (a) the daily drilling report;
- (b) the daily geological report including any formation evaluation logs and data; and
- (c) in the case of a production installation, a summary, in the form of a daily production report, of the daily record and the daily production record.

Monthly Production Report

86. (1) The operator shall ensure that a report summarizing the production data collected during the preceding month is submitted to the Board not later than the 15th day of each month.

(2) The report shall use established production accounting procedures.

Annual Production Report

87. The operator shall ensure that, not later than March 31 of each year, an annual production report relating to the preceding year for a pool, field or zone is submitted to the Board, including the performance, production forecast, reserve revision, reasons for significant deviations in well performance from predictions in previous annual production reports, gas conservation resources, efforts to maximize recovery and reduce cost, details of the operating and capital expenditures, including the cost of each well operation, for the preceding year, the current year and the projections for the next two years, and any other information required to demonstrate how the operator manages and intends to manage the resource without causing waste.

Environmental Reports

88. (1) For each production project, the operator shall ensure that, not later than March 31 of each year, an annual environmental report relating to the preceding year is submitted to the Board and includes

(a) a summary of the general environmental conditions during the year, including meteorological, oceanographic and ice conditions and a description of ice management activities; and

(b) a summary of environmental protection matters during the year, including any incidents that may have an environmental impact, discharges and waste material and a discussion of efforts undertaken to reduce pollution and waste material, and a description of environmental contingency plan exercises.

(2) For each drilling installation for an exploration or delineation well, the operator shall ensure that an environmental report relating to each well is submitted to the Board within 90 days after the rig release date and includes

(a) a description of the general environmental conditions during the drilling program, including meteorological, oceanographic and ice conditions and a description of ice management activities and downtime caused by weather or ice; and

(b) a summary of environmental protection matters during the drilling program, including a summary of spills, discharges and waste material, a discussion of efforts undertaken to reduce them, and a description of environmental contingency plan exercises.

Annual Safety Report

89. The operator shall ensure that, not later than March 31 of each year, an annual safety report relating to the preceding year is submitted to the Board and includes

(a) a summary of lost or restricted workday injuries, minor injuries and safety-related incidents that have occurred during the preceding year; and

(b) a discussion of efforts undertaken to improve safety.

Other Reports

90. The operator shall ensure that the Board is made aware of any report containing relevant information regarding applied research work or studies obtained or compiled by the operator relating to the operator's work or activities, as soon as the report is available and that a copy of it is submitted to the Board on request.

Well Termination Report

91. (1) The operator shall ensure that the details of the manner in which a well is completed, suspended or abandoned are recorded and that the report is submitted to the Board within 21 days after the well's rig release date.

(2) The well termination report shall include the rig release date and a schematic illustrating the condition of the well after termination.

(3) The report shall be signed and dated by the operator's representative.

Well History Report

92. (1) The operator shall ensure that a well history report is prepared for every well drilled by the operator under the well approval and that the report is submitted to the Board.

(2) The well history report shall contain a record of all operational, engineering and geological information that is relevant to the well.

(3) The operator shall ensure that a report including the following information is submitted to the Board within 30 days of the completion of a well operation:

(a) a schematic of, and relevant engineering data on, the down hole equipment, tubulars, Christmas tree and production control system;

(b) a description of the completion fluid properties; and

(c) a summary of the well operation, including any problems encountered during the well operation.