Enabling Statute: Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation Act

Nova Scotia Offshore Petroleum Drilling Regulations (SOR/92-676)

Regulation current to June 22nd, 2008

Nova Scotia Offshore Petroleum Drilling Regulations

SOR/92-676

Registration November 23, 1992

CANADA-NOVA SCOTIA OFFSHORE PETROLEUM RESOURCES ACCORD IMPLEMENTATION ACT

Nova Scotia Offshore Petroleum Drilling Regulations

P.C. 1992-2316 November 19, 1992
Whereas, pursuant to section 154 of the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, a copy of proposed Regulations respecting the drilling for petroleum in the Nova Scotia offshore area, substantially in the form annexed hereto, was published in the Canada Gazette Part I on December 7, 1991 and a period of 30 days was thereafter afforded to interested persons to make representations to the Minister of Energy, Mines and Resources with respect thereto;

Whereas more than 30 days have elapsed since the date of publication and no representations have been made with respect to the proposed Regulations;

And Whereas, pursuant to section 6 of the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, the Minister of Energy, Mines and Resources has consulted the Minister of Mines and Energy of the Province of Nova Scotia with respect to the proposed Regulations and the latter has given his approval for the making of the said Regulations;

Therefore, His Excellency the Governor General in Council, on the recommendation of the Minister of Energy, Mines and Resources, pursuant to section 153 of the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, is pleased hereby to make the annexed Regulations respecting the drilling for petroleum in the Nova Scotia offshore area.

Regulations Respecting the Drilling for Petroleum in the Nova Scotia Offshore Area

SHORT TITLE

1. These Regulations may be cited as the Nova Scotia Offshore Petroleum Drilling Regulations.

INTERPRETATION

2. In these Regulations,

"abandoned" means, in respect of a well or test hole, a well or test hole that has been permanently plugged; (abandon)

"accommodation installation" means an installation used to accommodate persons at a drill site that functions independently of a drilling installation; (ouvrage servant de logement)

"Act" means the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act; (Loi)

"Approval to Drill" means the approval granted to an operator pursuant to Part II to drill a well; (approbation de forer)

"Approval to Re-enter" means the approval granted to an operator pursuant to Part II to re-enter a well for the purpose of conducting a downhole operation; (approbation de rentrer)

"Approval to Terminate" means the approval granted to an operator pursuant to Part VII to terminate a well or test hole; (approbation de cesser)

"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)

"certificate of fitness" means a certificate, in the form satisfactory to the Board or to the person designated by the Board, issued by a certifying authority in accordance with section 4 of the Nova Scotia Offshore Certificate of Fitness Regulations; (certificat de conformité)

"certifying authority" has the same meaning as in section 2 of the Nova Scotia Offshore Certificate of Fitness Regulations; (société d'accréditation)

"Chief" means the Chief Conservation Officer; (version anglaise seulement)

"completed" means, in respect of a well, a well that has been prepared to permit the

(a) production of fluids from the well,

(b) observation of the performance of a reservoir,

(c) injection of fluids into the well, or

(d) disposal of fluids into the well; (achèvement)

"conductor casing" means casing that is installed in a well to facilitate well control during drilling of the hole for the surface casing; (tubage initial)

"conductor pipe" means a large diameter pipe installed in a well to provide a conductor for drilling fluid through surficial formations; (tube guide)

"development well" means a well that is drilled in a field or pool for the purpose of the

(a) production of fluids from the well,

(b) observation of the performance of a reservoir,

(c) injection of fluids into the well, or

(d) disposal of fluids into the well; (puits d’exploitation)

"discovery well" means an exploratory well that is in a significant discovery area; (puits de découverte)

"diverter" means a device fitted on a wellhead or on a marine riser for the purpose of directing the flow of fluids away from the drill floor in an emergency; (déflecteur)

"drill crew" means the personnel whose primary duties consist of the operation of a drilling rig; (équipe de forage)

"drill floor" means, in respect of a drilling rig, the stable platform surrounding the slip setting area that provides support for the drill crew during drilling operations; (plancher de forage)

"drill site" means a location where a drilling rig is or may be installed; (emplacement de forage)

"drilling base" means the stable foundation on which a drilling rig is installed and includes a platform fixed to or resting on the seafloor; (base de forage)

"drilling installation" means

(a) a drilling unit, or

(b) a drilling rig and its drilling base; (installation de forage)

"drilling program" means a program for the drilling of one or more wells within a specified area and time using one or more drilling installations and includes all operations and activities ancillary to the program; (programme de forage)

"Drilling Program Authorization" means the authorization given to a person pursuant to paragraph 142(1)(b) of the Act to conduct a drilling program; (autorisation d’exécuter un programme de forage)

"drilling rig" means the plant used to make a well by boring or other means and includes a derrick, draw works, rotary table, mud pump, blowout preventer, accumulator, choke manifold and other associated equipment including power, control and monitoring systems; (appareil de forage)

"drilling unit" means a drillship, submersible, semi-submersible, barge, jack-up or other vessel used in a drilling program and fitted with a drilling rig, and includes the drilling rig and other facilities related to the drilling program that are installed on the vessel; (unité de forage)

"drillship" means a ship that has a hull and is fitted with a drilling rig so that it is capable of drilling in deep water; (navire de forage)

"environmental conditions" means meteorological, oceanographical and other natural conditions, including ice conditions; (conditions environnementales)

"exploratory well" means a well, other than a development well or test hole, that is drilled for the purpose of discovering petroleum or obtaining geological information; (puits d'exploration)

"formation flow test" means an operation to induce the flow of formation fluids to the surface of a well for the purpose of procuring reservoir fluid samples and determining reservoir flow characteristics; (essai d'écoulement de formation)

"intermediate casing" means the casing installed in a well, following the installation of a surface casing in the well, through which further drilling operations may be carried out in the well; (tubage de protection)

"kick" means the spontaneous flow of fluids at the surface of a well caused by the entrance of formation fluids into the well-bore; (jaillissement)

"legal survey" means a survey made in accordance with the instructions of the Surveyor General; (arpentage officiel)

"natural environment" means the physical and biological environment in the area specified in the Drilling Program Authorization; (milieu naturel)

"operator" means an individual or company that has applied for or has been given a Drilling Program Authorization; (exploitant)

"permafrost" means the thermal condition of the ground when its temperature is at or below 0oC for more than one year; (pergélisol)

"permafrost casing" means the conductor casing installed in a well to protect against the hazards associated with the thawing of a permafrost section or the liberation of gas within or immediately below a permafrost section; (tubage de pergélisol)

"production casing" means the casing installed in a well-bore for production or injection purposes and may include an intermediate casing; (tubage de production)

"relief well" means a well drilled to assist in controlling a blowout in an existing well; (puits de secours)

"rig release date" means the date on which a drilling rig last conducted operations on a well in accordance with the Approval to Drill in respect of that well; (date de libération de l'appareil de forage)

"seafloor" means the surface of all that portion of land under the sea; (fond marin)

"spud-in" means, in respect of the drilling of a well, the initial penetration of the seafloor; (démarrage de forage)

"standby vessel" means a vessel that has been approved by the Board for use as a standby vessel; (navire de secours)

"support craft" means any vessel, tug, ship, aircraft, air-cushion vehicle or other craft used to provide transport for or assistance to a drilling program and includes a standby vessel but does not include a drilling installation; (véhicule de service)

"surface casing" means the casing installed in a well to a depth sufficient to establish well control for the continuation of the drilling operations; (tubage de surface)

"suspended" means, in respect of a well or test hole, a well or test hole in which drilling or producing operations have temporarily ceased; (suspension de l'exploitation)

"terminated" means

(a) in respect of a well, a well that has been abandoned, completed or suspended in accordance with these Regulations, and

(b) in respect of a test hole, a test hole that has been abandoned in accordance with these Regulations; (cessation)

"test hole" means any hole, other than a well or seismic shot hole, drilled through sedimentary rock to a depth of more than 30 m; (trou d'essai)

"U.L.C." means the Underwriters' Laboratories of Canada; (U.L.C.)

"waste material" means any refuse or garbage, or any other useless material generated during a drilling program and ancillary operations, but does not include drilling fluid and drill cuttings; (déchets)

"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 in or from a well; (contrôle d'un puits)

"well material" means any formation or reservoir material obtained from a well, including any cutting, core or fluid; (matériau de puits)

"wireline" means a line that is used to run survey instruments or other tools in a well and that is made of

(a) steel, or

(b) several wires made of steel, copper or other metals together with electrical insulation. (câble)

SOR/95-188, s. 1; 1998, c. 14, s. 101(F).

APPLICATION

3. These Regulations apply

(a) to every operator who explores or drills for petroleum under the Act; and

(b) in respect of every well and test hole drilled under the Act.

SUBMISSION OF INFORMATION

4. Any information that is required to be submitted under these Regulations shall be prepared and submitted in a form and manner satisfactory to the Board or any person designated by the Board.

PART I

GENERAL

Application for Authorization

5. Any person may apply for a Drilling Program Authorization by completing and forwarding an application to the Board.

Conditions of Drilling Program Authorization

6. A Drilling Program Authorization is subject to the following requirements:

(a) the program, including all equipment used therefor, shall be in compliance with this Part;

(a.1) the operator shall conduct the drilling operations in accordance with the contingency plans referred to in section 64;

(a.2) the operator shall conduct the drilling operations in accordance with any conditions imposed in relation to any approval referred to in paragraph (b);

(a.3) a certificate of fitness shall be obtained for each drilling installation and accommodation installation and shall continue to be valid and in force;

(b) every approval provided for in Parts II to VIII shall be obtained according to the requirements applicable to that approval; and

(c) the operator shall comply with section 72.

SOR/95-188, s. 2.

Defective or Experimental Equipment

7. (1) Subject to subsection (2), every operator shall

(a) forthwith repair or replace any equipment that is essential to a drilling operation and is defective;

(b) alter any operational procedure that is unsafe, inadequate or deficient; and

(c) initiate any new operational procedure required to ensure the safety of the drilling operation.

(2) Where, pursuant to subsection (1), an operator is required to replace equipment or alter a procedure described in the application for a Drilling Program Authorization, the operator shall obtain the approval of the Board or any person designated by the Board for the replacement equipment or altered procedure prior to undertaking the replacement or alteration.

8. (1) No operator shall in a drilling program use drilling equipment that has not been proven under field conditions unless it has been approved by the Board or any person designated by the Board in accordance with subsection (2).

(2) The Board or any person designated by the Board may approve the use in a drilling program of drilling equipment that has not been proven under field conditions, but any such approval shall cease to be valid if the actual performance of the equipment does not meet or exceed the performance characteristics specified for that equipment set out in the application for the Drilling Program Authorization.

Support Craft

9. Every support craft used in a drilling program shall be designed and constructed to operate safely and to provide safe and efficient support for all drilling operations.

10. Every support craft referred to in section 9 that is a vessel shall

(a) meet the requirements of the Collision Regulations, as amended from time to time, as if the support craft were a Canadian vessel; and

(b) carry emergency equipment and lifesaving devices sufficient in number to permit the escape of all persons from the support craft under any conditions that may reasonably be anticipated.

Standby Vessel

11. A standby vessel that has sufficient capacity and equipment to evacuate all personnel from the drill site shall be provided for a drilling operation as a means of evacuating personnel from the drill site.

12. Every standby vessel shall be equipped in accordance with the Canadian Coast Guard TP 7920E Standards Respecting Standby Vessels, as amended from time to time.

Pressure Vessels

13. The design and construction of pressure vessels, steam generators, hot water boilers, hydraulic systems and other components of a hydraulic, steam or compressed air system used in a drilling program shall be in accordance with the Canadian Standards Association Code B51-M1986, Boiler, Pressure Vessel, and Pressure Piping Code, as amended from time to time.

Hazards

14. Every operator shall take all reasonable precautions for the protection of personnel and equipment from naturally-occurring and man-made hazards in the area specified in the Drilling Program Authorization issued to that operator.

Requirements for Drilling Installations

15. Every drilling installation shall be designed and constructed to

(a) withstand the environmental conditions and effects that may reasonably be anticipated to occur during the drilling program; and

(b) permit the drilling and related operations to be conducted safely and efficiently.

16. (1) Every drilling installation shall

(a) be equipped with drip trays, curbs and gutters and such other facilities as are necessary to prevent pollution of the water by fuel or chemicals that have been spilled or leaked aboard the drilling installation; and

(b) be equipped with a means for burning, venting, storing, transporting or otherwise disposing of waste in accordance with sections 112 to 114.

(2) The operator of every drilling installation shall ensure that the drilling installation is equipped with a system capable of collecting any waste oil from the oil sumps on the installation.

17. to 20. [Repealed, SOR/95-188, s. 3]

Standards For Drilling Equipment

21. The derrick, mast, draw works, mud pump and related equipment of a drilling rig shall be designed to operate safely and efficiently under the maximum load conditions anticipated during any drilling operation.

Meteorological Forecasts

22. (1) Every operator shall obtain, during the period any operation is being carried out under a Drilling Program Authorization, forecasts of meteorological conditions, including ice movements, each day and each time during the day when the conditions change substantially.

(2) Every operator shall ensure that the drilling installation is equipped with facilities and equipment for observing, measuring and recording

(a) environmental conditions; and

(b) in the case of a floating drilling unit, the pitch, roll and heave.

Safety and Escape Arrangements

23. Every operator shall ensure that

(a) safety guards are installed on the drilling installation on all potentially dangerous machinery and on machinery that has external moving parts; and

(b) guard rails are installed on the drilling installation around the perimeter of the drill floor, deck area, walkways, stairs and any working areas where there is a drop from that area to an adjacent area of more than one metre.

24. [Repealed, SOR/95-188, s. 4]

25. Where a person is required to work in the derrick of a drilling rig as part of a normal drilling operation, an escape device shall, where practicable, be provided as a means of escape from the working platform of the derrick.

Medical and Rescue Facilities

26. (1) There shall be at least one person on each drilling crew engaged in a drilling operation who is the holder of a certificate in first aid from the St. John Ambulance Association or a certificate in first aid from another similar organization having requirements equivalent or superior to those of the St. John Ambulance Association.

(2) Every drilling installation shall be equipped with

(a) a medical treatment room that has

(i) resuscitation facilities and such medical treatment supplies as may be necessary to deal with any industrial accident that may reasonably be anticipated,

(ii) where the normal complement of the drilling installation is less than thirty, at least one standard hospital bed,

(iii) where the normal complement of the drilling installation is thirty or more, at least two beds, one of which shall be a standard hospital bed, and

(iv) a connection with the internal telephone system; and

(b) a rigid frame stretcher suitable for the transfer of an injured person to or from the drilling installation.

(3) Where a drilling operation is being carried out, the operator shall make arrangements whereby

(a) a qualified physician is available at all times for consultation or to be transported to the drilling installation;

(b) an injured person can, at any time, be speedily transported from the drilling installation to a hospital; and

(c) a qualified physician, a trained nurse or a medical attendant who is the holder of a valid certificate of medical training obtained by successfully completing a course such as a provincial industrial first aid course is available on the drilling installation at all times.

27. (1) Every drilling rig shall be equipped with

(a) at least five portable self-contained pressure-demand breathing devices available at locations readily accessible from the drill floor or an air manifold on the drill floor equipped with at least five outlets and five suitable face masks.

(b) and (c) [Repealed, SOR/95-188, s. 5]

(2) The living accommodation area of a drilling installation shall be equipped with at least four self-contained portable pressure-demand breathing devices.

SOR/95-188, s. 5.

28. Every drilling installation shall be equipped with two buoyant personnel transfer baskets that are in serviceable condition.

Electrical Equipment

29. [Repealed, SOR/95-188, s. 6]

30. (1) Every electrical installation on a drilling unit used to carry out a drilling program shall

(a) comply with the Institute of Electrical and Electronics Engineers, Inc. IEEE Recommended Practice for Electric Installations on Shipboard, Standard 45-1983, as amended from time to time; and

(b) be explosion-proof or pressurized where it is installed

(i) in any open space within 15 m horizontally of the rotary table of the drilling unit,

(ii) less than 3 m above the drill floor of the drilling unit or less than 10 m below the drill floor, or

(iii) within 3 m of a mud ditch, shale shaker, degasser or mud tank.

(2) Where combustible gases may accumulate in any enclosed area of a drilling installation and air is used to provide the pressure referred to in paragraph (1)(b), the air intake shall be located outside and as far as practicable from any area where combustible gases may accumulate.

(3) The primary circuits from the power plant serving a drilling installation shall be equipped with at least two manual shut-off switches, each at a different location.

Lighting

31. (1) During the course of a drilling program, all working areas shall be provided with adequate lighting.

(2) [Repealed, SOR/95-188, s. 7]

SOR/95-188, s. 7.

32. to 44. [Repealed, SOR/95-188, s. 8]

Cranes

45. (1) Every crane that is used on a drilling installation shall have

(a) a load capacity chart that specifies boom angle and safe working loads for each block posted inside the crane control cab;

(b) load measuring devices for the main block, where the load rating of the crane is more than five tonnes; and

(c) boom and block travel-limiting devices.

(2) All crane hooks used on a drilling installation shall be equipped with safety catches.

(3) The capacity of each sling used on a drilling installation shall be clearly and permanently marked on the sling.

Blowout Preventer System Requirements

46. (1) Where drilling and related operations are being carried out below the conductor casing of a well, a diverter or blowout preventer system shall be installed on the wellhead.

(2) Where hydraulic control lines are used to activate a blowout preventer system, the lines shall be fire-resistant.

(3) A drilling system shall be designed to provide a means of installing on and removing from the wellhead the blowout preventer system referred to in subsection (1).

(4) Subject to subsection (5), each blowout preventer system installed pursuant to subsection (1) shall have a rated working pressure in accordance with section 81.

(5) The rated working pressure of a blowout preventer system installed pursuant to subsection (1) shall be not less than 13 MPa.

(6) A blowout preventer system installed pursuant to subsection (1) shall be equipped with

(a) a control panel whose functions are clearly identified thereon and in full view and within easy access of the driller’s station;

(b) a control panel in addition to the control panel described in paragraph (a), in a readily accessible and protected location remote from the drill floor;

(c) a control system that is capable of closing

(i) any ram-type blowout preventer within 30 seconds after activation,

(ii) any annular-type blowout preventer with a base diameter of less than 450 mm within 45 seconds after activation, and

(iii) any other type of blowout preventer within 60 seconds after activation; and

(d) a secondary control system and a secondary source of operating power capable of activating the blowout preventers in case the primary control system or primary power source fails.

(7) Any accumulator in a hydraulic blowout preventer control system installed on a wellhead during the drilling of a well shall be capable of closing and opening the annular-type blowout preventer and one of the ram-type blowout preventers in one continuous sequence of operations without recharging.

(8) The blowout preventer system installed pursuant to subsection (1) shall be designed to permit the maintenance, retrieval and replacement of any major component of the system while maintaining well control.

47. Equipment used for the purpose of well control shall

(a) have sufficient structural strength to withstand normal loading conditions associated with drilling and related operations; and

(b) be designed to operate under all environmental conditions that may reasonably be anticipated to occur during the drilling program.

Casing

48. (1) Any casing installed in a well shall be new pipe or, subject to subsection (2), reconditioned pipe.

(2) No reconditioned pipe shall be used as casing unless it has been inspected by a method approved by the Board or any person designated by the Board and found to have adequate strength for its intended purpose.

(3) Where a floating drilling unit is used to drill a well, the conductor casing for that well shall be designed to have sufficient structural strength to support the load imposed by the marine riser and by the diverter or the blowout preventer system.

(4) In the design of the conductor casing referred to in subsection (3), the support provided by the conductor pipe may be taken into account.

49. (1) The casing installed in any well shall be designed to withstand burst, collapse, tension, bending, buckling or other stresses that are known to exist or that may reasonably be expected to exist.

(2) For the purpose of subsection (1), the performance properties of any casing shall be considered to be those listed for that casing in the American Petroleum Institute's API Bulletin on Performance Properties of Casing, Tubing, and Drill Pipe, API BUL 5C2, nineteenth edition, October 1984.

(3) The minimum design factors used in the design of well casings shall be

(a) 1.33 for burst, for surface and intermediate casing;

(b) 1.0 for burst, for conductor casing, production casing and production casing liners;

(c) 1.0 for collapse; and

(d) 1.6 for tension.

50. (1) Subject to subsection 61(3), the casing installed in any well shall be designed to withstand burst pressures using the following assumptions:

(a) the maximum internal pressure in the conductor casing and surface casing is 22 kPa per metre of depth to which it is run;

(b) the maximum internal pressure in intermediate casing is equal to 75 per cent of the maximum anticipated formation fluid pressure at the depth to which the well is to be drilled prior to setting a further casing;

(c) the maximum internal pressure for production casing is the maximum reservoir pressure;

(d) the maximum internal pressure determined in accordance with paragraphs (b) and (c) is reduced by an internal pressure equivalent to a head of methane gas that extends from the wellhead to the depth to which the well is to be drilled prior to setting a further casing; and

(e) for surface and intermediate casing, an external pressure exists that is equivalent to a head of water from the casing shoe to mean sea level.

(2) For the purposes of paragraph (1)(b), where the formation fluid pressure is not known, the formation fluid pressure at any depth shall be assumed to be 11 kPa per metre of well depth.

51. (1) The casing installed in any well shall be designed to withstand collapse loading based on the following assumptions:

(a) the hydrostatic head of the drilling fluid in which the casing is run acts on the exterior of the casing at any given depth;

(b) subject to paragraph (c), the casing is 50 per cent evacuated; and

(c) the production casing is completely evacuated.

(2) For the purpose of subsection (1), the effect of axial stresses on collapse resistance shall be taken into account.

52. The casing installed in any well shall be designed to withstand tensile loading based on the following assumptions:

(a) the weight of casing is its weight in air; and

(b) the tensile strength of the casing is the yield strength of the casing wall or of the joint, whichever is the lesser.

53. Where casing liners are used in lieu of full casing strings, the casing liner and the casing to which it is attached shall together meet the relevant design criteria set out in sections 49 to 52.

54. The setting depth of any casing string shall be based on relevant geological and engineering data.

55. (1) Where normal pressure conditions exist, the casing program shall, in respect of any exploratory well, provide for

(a) conductor pipe set at a minimum depth of 10 m below the seafloor;

(b) one or more conductor casings set at a depth not exceeding 250 m below the seafloor unless a diverter system is installed on a cemented conductor pipe or previous conductor casing in which case the conductor casing shall be set at a depth not exceeding the greater of

(i) four times the depth of the previous conductor casing or cemented conductor pipe, and

(ii) 500 m;

(c) surface casing set at a depth to ensure that at least 25 per cent of the well-bore is cased at all times; and

(d) intermediate casing as required to protect the well against anticipated pressures or difficult hole conditions and to ensure that at least 25 per cent of the well-bore is cased at all times while drilling below surface casing.

(2) No operator shall, without the approval of the Board or any person designated by the Board, install additional casing in a well, including production casing and liners, below the intermediate casing referred to in paragraph (1)(d).

(3) No operator shall set any casing in a well unless the operator has received approval from the Board or any person designated by the Board for the depth at which the casing may be set.

Cementation of Casing

56. The mixture of the cement to be used and the procedure to be followed in the cementation of casing strings in a well shall be designed to

(a) prevent the movement of formation fluids in the casing-formation annuli or casing-casing annuli;

(b) provide support for the casing; and

(c) retard corrosion of the casing.

57. (1) The conductor casing and permafrost casing shall be cemented where practicable from the shoe of the casing to the sea-floor.

(2) Surface casing shall be cemented to the sea-floor or to a depth that is not less than 25 m above the base of any previous casing string.

(3) Intermediate casing shall be cemented with sufficient cement to

(a) isolate all hydrocarbon or potable water zones;

(b) isolate abnormally pressured intervals from normally pressured intervals; and

(c) rise to a minimum of 300 m above the casing shoe or 150 m above the base of the permafrost.

58. Where practicable, every casing liner shall be cemented for its full length.

Marine Riser

59. (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 wave and current forces; and

(e) permitting the drilling fluid to be returned to the drilling unit.

(2) Every marine riser shall be supported in a manner that effectively isolates it from the forces caused by the motion of the drilling unit.

Drilling Fluid System

60. (1) The drilling fluid system, including the drilling fluid, the circulating system and the associated monitoring and maintenance equipment used during a drilling operation shall be capable of

(a) preventing the uncontrolled entry of formation fluids into the well-bore;

(b) allowing proper well evaluation;

(c) coping with all lithological, operational, pressure, temperature and other well conditions that may be encountered; and

(d) removing excess drill solids, weighting material and formation fluids from the drilling fluid.

(2) The combined capacity of the drilling fluid tanks of every drilling fluid system shall be not less than the greater of

(a) 180 m3, and

(b) 50 per cent of the aggregate of the volume of the hole and the marine riser.

(3) The equipment provided to monitor the drilling fluid of every drilling fluid system shall include

(a) a mud pit level indicator with a warning device to alert personnel to mud volume gains and losses;

(b) a mud volume measuring device that accurately determines the mud volume used to fill the hole on trips;

(c) a mud-return or full-hole indicator that monitors drilling fluid returns;

(d) equipment to test the physical and chemical properties of the drilling fluid entering and leaving the hole, including density, viscosity, water loss, filter cake, salinity, pH, solids content and gel strengths; and

(e) automatic gas detecting, measuring and recording devices that trip an automatic audio alarm to warn of any increase in the gas content of the drilling fluid.

(4) The indicators and alarms required by subsection (3) shall be strategically located on the drilling rig to alert any drilling supervisor.

(5) Every operator shall provide a means, approved by the Board or any person designated by the Board, of disposing of drilling fluid, drill cuttings and gas separated from the drilling fluid.

Air, Gas and Foam Drilling

61. (1) No operator shall drill a well using air, gas, foam or any other fluid in the circulatory system without the approval of the Board or any person designated by the Board.

(2) Where air or gas is used in the circulatory system referred to in subsection (1), the operator shall

(a) install and maintain a rotating head capable of diverting the return air or gas flow into a bleed-off line that is as straight as practicable and is directed away from the drilling installation;

(b) install and maintain, where formations that may contain hydrogen sulphide are being drilled, a hydrogen sulphide monitor continuously on the bleed-off line;

(c) install and maintain a device to provide a continuous source of ignition at the end of the bleed-off line; and

(d) provide a reserve volume of mud that is

(i) in suitable condition to be pumped into the well without delay,

(ii) equal in volume to at least 1.5 times the volume of the hole, and

(iii) not less than 1 200 kg/m3 in density.

(3) Where air, gas or foam is used in the circulatory system referred to in subsection (1), the blowout preventer system and the casing shall be capable of containing the maximum formation pressure that may be encountered.

Testing Equipment

62. (1) The equipment used in a formation flow test shall have the capacity to

(a) reverse circulate the test string;

(b) conduct the flow from the well through the surface control valve to the choke manifold; and

(c) treat, store, burn or otherwise dispose of the fluids produced during the testing operation.

(2) The rated working pressure of formation flow test equipment and related equipment shall be equal to or greater than the maximum shut-in formation pressure that may reasonably be anticipated.

(3) The formation flow test equipment referred to in subsection (1) shall include a downhole safety valve that permits closure of the test string above the packer.

(4) Any formation flow test equipment used in testing a well that is drilled with a floating drilling unit shall have a subsea test tree that includes

(a) a valve that

(i) may be operated from the surface, and

(ii) automatically closes when there is a failure in any part of the formation flow test equipment; and

(b) a release system that permits the test string to be hydraulically or mechanically disconnected within or below the blowout preventers.

Operating Manuals

63. (1) Every operator shall prepare an operating manual for all normal drilling and related operations carried out by that operator and for all abnormal conditions or situations that can be reasonably anticipated during drilling operations.

(2) A copy of the operating manual referred to in subsection (1) shall be

(a) readily accessible on each drilling installation and any accommodation installation at the drill site; and

(b) submitted to the Chief on request.

Contingency Plans

64. (1) Every operator shall ensure that contingency plans have been formulated and that equipment is available to cope with any reasonably foreseeable emergency situation during a drilling program, including

(a) a serious injury to or the death of any person;

(b) a major fire;

(c) the loss of or damage to support craft;

(d) the loss or disablement of a drilling unit, drilling rig, drilling base or any accommodation installation;

(e) the loss of well control;

(f) a situation requiring the drilling of a relief well;

(g) hazards unique to the drill site; and

(h) spills of oil or other pollutants.

(2) The plans referred to in subsection (1) shall provide for coordination with any existing local or national contingency plans.

(3) A copy of the plans referred to in subsection (1) shall be

(a) readily accessible on each drilling installation and any accommodation installation; and

(b) submitted to the Chief on request.

Misuse of Safety and Fire-fighting Equipment

65. No person shall tamper with or activate without cause any safety or fire-fighting equipment required under section 12, subsection 19(2) and sections 27, 32, 38, 39, 43 and 44 or the switches required under subsection 30(3).

PART II

APPROVAL TO DRILL OR APPROVAL TO RE-ENTER A WELL OR TO DRILL A TEST HOLE

Notification

66. Every operator shall, at least 45 days prior to the commencement of the spud-in of any proposed well or the re-entry of a well that has been suspended, notify the Chief in writing of the day spud-in or re-entry, as the case may be, is to commence.

Prohibition

67. (1) No person shall

(a) drill a well without an Approval to Drill that well granted by the Board or any person designated by the Board pursuant to this Part; or

(b) for the purpose of conducting a downhole operation, re-enter any well that has been suspended without an Approval to Re-enter that well granted by the Board or any person designated by the Board pursuant to this Part.

(2) No person shall drill a test hole without the approval of the Board or any person designated by the Board.

Application

68. (1) Every operator shall submit to the Board an application for an Approval to Drill or Approval to Re-enter not less than 21 days prior to the date that operator plans to spud-in or re-enter.

(2) The application required by subsection (1) shall include the following information:

(a) the name of the well;

(b) the geographical coordinates of the well;

(c) the proposed depth of the well;

(d) the name of the drilling contractor and the identification of the drilling installation to be used;

(e) the proposed spud-in or re-entry date and estimated time required to drill the well;

(f) the proposed drilling program including any program for the taking of conventional cores, wireline logs or formation flow tests;

(g) the casing program and the volume of cement estimated to be used;

(h) the elevation of the rotary table;

(i) the depth of the water at the drill site;

(j) the geological prognosis and prospective horizons; and

(k) such other information as the Board or any person designated by the Board may require.

(3) The application required by subsection (1) shall be accompanied by

(a) a tentative survey plan showing the location of the proposed well and a description of the survey system that will be used to establish the position of the well; and

(b) the well prognosis described in subsections (4) and (5).

(4) The well prognosis referred to in paragraph (3)(b) shall include information in respect of

(a) all surface and subsurface conditions that may affect the drilling of the well;

(b) the manner in which the program for the drilling of the well has been designed to overcome the meteorological and oceanographic conditions referred to in the application for a Drilling Program Authorization; and

(c) any other matter in respect of the well on the request of the Board or any person designated by the Board.

(5) The well prognosis referred to in paragraph (3)(b) shall be divided into the following parts:

(a) part one, which shall provide general information in respect of the well, including the well name, well classification and, where the well is a development well, the coordinates of the location at which the well is designed to penetrate the production interval or injection interval;

(b) part two, which shall provide information in respect of surface conditions in the vicinity of the well that may affect the safety and efficiency of operations, and the anticipated meteorological and oceanographic conditions and the topography and composition of the seafloor;

(c) part three, which shall provide information in respect of the subsurface conditions anticipated at the drill site that may affect the safety and efficiency of the drilling operations and shall include

(i) the depth and thickness of geological formations and the depth of geological markers,

(ii) the depth and nature of formations where problems such as lost circulation zones, swelling shale zones and permafrost zones are anticipated, and

(iii) the anticipated depth of unconsolidated sand and gravel below the seafloor; and

(d) part four, which shall provide information to demonstrate that the drilling program is suitable for the conditions described in paragraphs (b) and (c) including

(i) the equipment, procedures and resources to be employed to protect the natural environment in the vicinity of the well,

(ii) the details of the casing and cementing program to be used in respect of the well,

(iii) the variations in the blowout preventer and drilling fluid systems from those described in the Drilling Program Authorization, and

(iv) the well evaluation and termination program.

Approval Conditions

69. Approval to Drill or Approval to Re-enter shall be conditional on

(a) the operator commencing drilling within 120 days after the day the Approval is granted;

(b) the well being drilled no deeper than the depth proposed in the application for the Approval;

(c) the contractor and the drilling installation identified in the application for the Approval being used in the drilling operations; and

(d) the operator following the drilling program proposed in the application for the Approval.

Suspension or Revocation of Approval

70. The Board or any person designated by the Board may suspend or revoke the Approval to Drill or Approval to Re-enter where the safety of operations becomes uncertain owing to

(a) the level of performance of the drilling rig, drilling base or drilling unit or any support craft being demonstrably less than the level of performance indicated in the application for a Drilling Program Authorization submitted by the operator; or

(b) the environmental conditions encountered in the area of the drilling program for which the Approval to Drill or Approval to Re-enter was granted, being more severe than those predicted by the operator when the Drilling Program Authorization was given.

Location of Well

71. (1) The location of a well is subject to the approval of the Board or any person designated by the Board.

(2) The surface location of a development well shall be selected and the drilling procedures for that well designed to ensure that the well intersects the reservoir at a point consistent with good reservoir engineering practice.

Evidence of Financial Responsibility

72. Every operator shall, prior to drilling or re-entering a well,

(a) furnish the Board with evidence of financial responsibility in a form and in an amount satisfactory to the Board or any person designated by the Board, for the purpose of ensuring that the operator terminates the well and leaves the drill site in a satisfactory condition in accordance with section 180; and

(b) furnish the Board with evidence, in a form satisfactory to the Board or any person designated by the Board, that the operator is financially able to meet any financial liability that may be incurred as a result of the drilling of a well or of any operation in the well.

PART III

OPERATIONAL REQUIREMENTS

Drilling of a Well

73. Every operator shall ensure that

(a) the drilling of a well is conducted in such a manner that full control of the well is maintained at all times;

(b) plans have been made and equipment is available to deal with all abnormal situations that may reasonably be anticipated;

(c) the administrative and logistic support that is provided for a drilling program includes the following, namely,

(i) transportation facilities suitable for the area of operations,

(ii) suitable supplies of drilling consumables, food and fuel,

(iii) accommodation for personnel,

(iv) medical facilities described in section 26,

(v) storage and repair facilities, and

(vi) the communication systems referred to in section 43;

(d) the drilling of the well is conducted in accordance with the procedures and using the equipment authorized under Parts I and II;

(e) equipment including travelling blocks and ancillary equipment, masts, substructures, drilling lines, well control equipment and pressure vessels are used or operated within the limits specified by the manufacturer of the equipment;

(f) at the end of each crew shift, the retiring drilling supervisor of any drilling rig informs the new supervisor of any mechanical deficiencies that have not been rectified during the shift and of any

downhole conditions or other problems that have a bearing on the safe conduct of the drilling of the well; and

(g) differences in language or other barriers to effective communication do not jeopardize the safety of operations on any drilling rig, drilling base, drilling unit or support craft.

Surveys

74. (1) Every operator shall ensure that a legal survey is used to confirm the location of

(a) any development well;

(b) any discovery well; or

(c) any other well, on the request of the Chief.

(2) Every operator shall determine the geographical location of any exploratory well by a survey made in accordance with recognized surveying practices as soon as practicable after the drilling installation is in position at the well location.

Safety Zone

75. (1) For the purposes of this section, the safety zone around a drilling installation consists of

(a) the area within a line enclosing and drawn at a distance 500 m from the perimeter of the drilling installation; and

(b) the area within a line enclosing and drawn at a distance of 50 m from the anchor pattern, if any, of the drilling installation.

(2) No person, other than a person authorized by the operator or the Board or any person designated by the Board, shall enter the safety zone around a drilling installation as described in subsection (1).

(3) Every 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 the boundaries of the safety zone.

Availability of Regulations

76. Every operator shall ensure that a copy of these Regulations is

(a) kept on any drilling installation during the period a drilling program is being conducted under a Drilling Program Authorization; and

(b) available for examination on request by any person on the drilling installation.

Display of Authorizations, Approvals and Critical Procedures

77. Every operator shall ensure that

(a) the Drilling Program Authorization, the Approval to Drill and the Approval to Re-enter are displayed in a prominent place on the drilling installation in respect of which they apply; and

(b) current information on the status of the well, including the location and arrangement of blowout preventers and mud density, together with the detailed procedures for controlling a kick are displayed in a conspicuous place in the doghouse or at the driller's station.

Drilling Equipment Tests

78. A conservation engineer may, where it is reasonable having regard to the drilling operation in progress and after giving written notice to the operator, require the operator to test the functioning, capacity or structural integrity of any item of drilling equipment the failure or malfunction of which might affect the safety of personnel or the pressure control of the well.

Well Control Equipment

79. Every operator shall ensure that all well control equipment, including the casing, the blowout preventer system and the surface equipment necessary for formation flow testing, is

(a) installed in a manner that ensures that it can properly fulfil its function; and

(b) pressure tested on installation and periodically thereafter in accordance with sections 88 to 91.

80. (1) Every operator shall ensure that a blowout preventer and a marine riser or a diverter and a marine riser are installed on the conductor pipe where necessary to ensure that the portion of the hole below the conductor pipe can be drilled safely.

(2) Where conductor casing is installed on a well, every operator shall ensure that

(a) a blowout preventer system is installed on the wellhead that

(i) has a rated working pressure that exceeds the maximum bottom-hole pressure anticipated before the next casing is installed,

(ii) consists of at least three hydraulically-operated blowout preventers of which one is an annular-type preventer, one is fitted with pipe rams and one is fitted with blind rams,

(iii) has a pressure relief line and a kill line, and

(iv) has a choke manifold at the surface; or

(b) a diverter system that gives protection equivalent to or superior to the protection provided by the system described in paragraph (a) is installed.

81. (1) Every operator shall ensure that a blowout preventer system is installed on the wellhead during all drilling operations that are carried out below the surface casing.

(2) Subject to subsections (3) and 61(3), every operator shall ensure that the blowout preventer system for all drilling operations below the surface casing has a rated working pressure that is

(a) greater than 75 per cent of the maximum anticipated formation pressure in the case of ram-type preventers and greater than 50 per cent of the maximum anticipated formation pressure in the case of annular-type preventers; and

(b) greater than 20 MPa unless the operator provides data to show that a blowout preventer system with a pressure rating of less than 20 MPa can be used without jeopardizing the safety of the well.

(3) The pressure rating of any annular-type preventer need not exceed 35 MPa.

(4) For the purposes of subsections (2) and 61(3), where the maximum formation pressure is not known, it shall be assumed to be 11 kPa per metre of well depth.

(5) Every operator shall ensure that the blowout preventer system referred to in subsection (1) includes at least

(a) four hydraulically-operated blowout preventers comprising

(i) one annular-type preventer, and

(ii) three ram-type preventers, one of which is fitted with blind rams and two with rams that fit the drillpipe in use;

(b) a drilling spool with side outlets, unless side outlets are provided in the body of the preventer;

(c) a pressure relief line and kill line; and

(d) a choke manifold.

(6) Every operator shall ensure that the blowout preventer system referred to in subsection (1), where the blowout preventers are submerged, includes blind rams that are capable of shearing the drillpipe.

82. Every operator shall ensure, when running casing in a well, that a blowout preventer system is installed on the wellhead consisting of

(a) at least one annular-type preventer when running

(i) surface casing,

(ii) intermediate casing in a well where the blowout preventers for the well are submerged, or

(iii) production casing in an exploratory well where the blowout preventers for the well are submerged;

(b) at least one annular-type preventer and one ram-type preventer fitted with rams to fit the casing while running intermediate and production casing in a well where the blowout preventers for the well are not submerged; and

(c) at least one annular-type preventer and one ram-type preventer fitted with rams to fit the casing or two annular-type preventers while running production casing in a development well where the blowout preventers for the well are submerged.

Safety Valves

83. Every operator shall ensure that

(a) a safety valve is installed in the drill string immediately above and below the kelly; and

(b) there is available on every drill floor

(i) full-opening drill string safety valves to fit each type of connection in the drill string, and

(ii) a suitable inside blowout preventer valve.

Choke Manifold

84. (1) Every operator shall ensure that a choke manifold that has a rated working pressure equal to or greater than the pressure rating of the blowout preventers referred to in sections 81 to 83 is installed on or near the drill floor.

(2) The inside diameter of all lines and valves constituting the choke manifold referred to in subsection (1) shall be greater than 64 mm.

(3) Every operator shall ensure that the flow from a well is capable of being directed through the main flow line and two or more secondary lines of the choke manifold and that each secondary line is equipped with an adjustable choke.

(4) The choke manifold referred to in subsection (1) shall

(a) be equipped with at least one pressure gauge; and

(b) have a sufficient number of outlets to permit the installation of gauges to measure the pressure under any selection of flow route.

(5) Every operator shall ensure that during all drilling operations gauges sufficient in number to fit all gauge outlets on the choke manifold are available for immediate installation.

(6) Every operator shall ensure that where a choke manifold referred to in subsection (1) has a pressure rating greater than 20 MPa, the manifold is equipped with an automatic choke and the control for the automatic choke is on or near the drill floor.

(7) Every operator shall ensure that every choke manifold referred to in subsection (1) is protected against freezing.

(8) Every operator shall ensure that where a choke manifold is in an enclosed area, the area is properly ventilated and has at least two exits.

Flow Lines from Wells

85. Every operator shall ensure that all flow lines, pressure relief lines, kill lines and choke lines

(a) are made of steel or high pressure flexible hose covered with fire-resistant material;

(b) have an inside diameter that is greater than 64 mm;

(c) are properly installed and securely tied down;

(d) are designed so that there is a minimum number of changes in the direction of flow and, where an abrupt change in direction is necessary at any point, the interior of the line is protected against erosion at that point; and

(e) are identified by colour or other means at the choke manifold.

86. Every operator shall ensure that the main flow line from a well is equipped with a valve located near the wellhead and is capable of being operated from the driller’s station.

Flare Line

87. (1) [Repealed, SOR/95-188, s. 9]

(2) Every operator shall ensure that no valve is located on the flare line downstream of the choke manifold while drilling operations are in progress.

(3) Every operator shall install, for any well, at least two complete flare lines or other devices that allow the flow of fluid from the well to be directed to two or more sides of the drilling unit for flaring.

SOR/95-188, s. 9.

Pressure Tests of Casing and Blowout Preventers

88. (1) Every operator shall ensure that

(a) every blowout preventer is visually inspected before or immediately after installation to confirm that

(i) it is in good working order, and

(ii) the packing elements and seals for each preventer are in good condition; and

(b) the blowout preventer control system is pressure tested to its maximum operating pressure

(i) immediately following installation, where the blowout preventers are not submerged, and

(ii) immediately prior to installation, where the blowout preventers are submerged.

(2) When pressure testing any blowout preventer, choke manifold, kill line and pressure relief line as required by these Regulations, every operator shall ensure that

(a) a low viscosity fluid is used; and

(b) the following two test pressures are used for each test, namely,

(i) a test pressure of 1 500 kPa, and

(ii) a test pressure equal to that prescribed for a casing pressure test in paragraph 91(2)(b) except in the case of an annular-type preventer, in which case the test pressure shall be equal to 50 per cent of the rated working pressure of the preventer or the pressure prescribed by paragraph 91(2)(b), whichever is the lesser, and this test shall be made with the preventer closed on the drillpipe being used.

89. Every operator shall ensure that

(a) the equipment referred to in subsection 88(2) is pressure tested

(i) after installation,

(ii) before drilling out any string of casing installed in a well,

(iii) before commencing a formation flow test or a series of formation flow tests,

(iv) following repairs that require disconnecting a pressure seal in the wellhead assembly, and

(v) not less than once every fourteen operational days;

(b) appropriate remedial measures are undertaken immediately where any blowout preventer fails to meet pressure test requirements; and

(c) blowout preventers are not removed from the wellhead, unless the well is adequately plugged.

90. Notwithstanding paragraph 89(a), the operator need not pressure test shear rams in a blowout preventer stack where there is a separate set of blind rams in the same stack.

91. (1) Every operator shall ensure that casing is pressure tested

(a) after installation and prior to drilling out the cement plug or casing shoe;

(b) immediately after any remedial cementing;

(c) at least once every 1,000 rotating hours or more frequently where casing wear is detected; and

(d) immediately prior to perforating or using the casing for purposes of formation flow testing.

(2) Every operator shall ensure that

(a) conductor casing is tested to a minimum surface pressure of 1 000 kPa;

(b) surface casing, intermediate casing and intermediate casing liners are pressure tested to a surface pressure that is equal to or greater than the least of

(i) the rated working pressure of the blowout preventers,

(ii) 60 per cent of the maximum formation fluid pressure anticipated during the next phase of the drilling operation, and

(iii) the calculated formation fracture pressure at the casing shoe; and

(c) production casing and production casing liners are tested to a surface pressure that is equal to at least 90 per cent of the maximum reservoir pressure.

(3) For any casing pressure test to be satisfactory, the test pressure prescribed in subsection (2) shall be maintained for five minutes with no pressure decline or for fifteen minutes with a pressure decline of less than five per cent of the test pressure.

(4) Where the operator suspects that there may be excessive casing wear, the operator shall so advise the Chief and shall conduct a pressure test on the casing.

(5) Where a casing string does not hold the required pressure throughout its length during a pressure test, the operator shall suspend any drilling or testing operation and shall not recommence that operation without taking precautions or remedial measures approved by the Board or any person designated by the Board.

Coal and Mineral Deposits

92. Where coal or other mineral deposits are encountered while drilling, the operator shall notify the Chief of the deposits and shall take such measures as are necessary to protect the deposits.

Cementation

93. Every operator shall ensure that

(a) the cementation of casing and casing liners is carried out in accordance with the drilling program specified in the Approval to Drill;

(b) where practicable, fluid returns are visually observed during all cementation operations; and

(c) the cement rise in the annulus, based on observations made under paragraph (b) and on the design data, is calculated and is recorded.

94. (1) Every operator shall ensure that the volume of cement slurry used for the cementation of any casing is at least 30 per cent greater than the estimated annular volume to be filled, unless that estimate is based on a reliable caliper log, in which case the operator shall ensure that the volume is at least 10 per cent greater than the estimated annular volume.

(2) Where there are indications during or after the completion of cementation that the casing is not properly cemented, the operator shall conduct a pressure test at the shoe of the casing or otherwise determine the effectiveness of the cement in the annulus and ensure that any necessary remedial action is taken.

Waiting on Cement Time

95. (1) Every operator shall ensure that the time interval while waiting for cement to harden before resumption of drilling after cementation of any casing is in no case less than 6 hours and is less than 12 hours only where the operator determines, by testing representative samples of the cement, that the cement has a compressive strength of at least 3 500 kPa.

(2) The operator shall record the time interval and the result of any test referred to in subsection (1) on the tour sheets referred to in section 148.

Maximum Pressure during Well Stimulation

96. Every operator shall ensure that the maximum injection pressure used during any well stimulation operation does not exceed the burst pressure resistance of the weakest joint in the casing or tubing used for the injection or the rated working pressure of the wellhead, whichever is the lesser.

Formation Leak-Off Test

97. (1) Every operator shall conduct a pressure test in the hole to determine the pressure integrity of the formations present in the hole

(a) prior to drilling more than 60 m below the shoe of any casing other than the conductor casing; and

(b) when an over-pressured zone is about to be penetrated.

(2) The test referred to in subsection (1) shall test the formations to a pressure that is the lesser of one and one-third times the estimated formation fluid pressure and the pressure at which the formation begins to accept the test fluid prior to the point of fracturing.

Monitoring of Drilling

98. Every operator shall ensure that

(a) the drilling fluid is monitored during the drilling of a well, after the conductor casing has been installed in the well, to determine

(i) its volume, flow rate and chemical and physical properties, and

(ii) where automatic gas detecting, measuring and recording devices are required by paragraph 60(3)(e), the nature and relative quantity of gas in the drilling fluid returns;

(b) the results of the determination made in accordance with paragraph (a) are recorded and the record maintained at the drill site;

(c) the equipment required by subsection 60(3) is maintained in good working order at all times; and

(d) a continuous surveillance of the drilling fluid returns is maintained at all times when significant amounts of formation fluid are entering the well-bore or when a zone that is over-pressured or contains petroleum is being penetrated.

99. (1) Every operator shall ensure that

(a) the rate of penetration of the formations of a well is recorded continuously while drilling or coring by an automatic device located on the drill floor;

(b) the drilling fluid and the drilling fluid system are maintained and operated in such a manner as to prevent formation fluids entering or leaving the well-bore except under controlled conditions; and

(c) drilling ceases and remedial measures are undertaken immediately when the hydrostatic head of the drilling fluid fails to over-balance the formation fluid pressure, except where drilling in an under-balanced condition has been approved by the Board or any person designated by the Board.

(2) Unless approval to drill in an under-balanced condition has been obtained from the Board or any person designated by the Board, every operator shall endeavour to keep the hole filled with a fluid of sufficient density to over-balance formation pressures at all times.

(3) During tripping and except as provided in subsection (2), every operator shall ensure that the hole is filled with the correct amount of drilling fluid after every fifth stand of drillpipe or every single stand of drillcollars is withdrawn from the hole.

Volume of Drilling Fluid

100. (1) Every operator shall ensure that, during any drilling operation, the volume of active drilling fluid in the surface system of a well is not less than 50 per cent of the hole capacity or 65 m3, whichever is the lesser.

(2) Every operator shall, in respect of an exploratory well, have stored on the drilling installation reserve drilling fluid

(a) the volume of which is greater than the lesser of

(i) the volume of the drilling fluid in the active mud tanks at the surface of the well, and

(ii) 65 m3; and

(b) that is in a suitable condition for immediate use during any period that drilling is in progress.

(3) The reserve drilling fluid required by subsection (2) shall, in respect of an exploratory well, have a density of 200 kg/m3 greater than the density of the fluid in the active system unless the operator provides data to the Chief to show that a lesser density will provide an equivalent or greater degree of well control.

101. Except while drilling the hole for the conductor casing, every operator shall ensure that drilling ceases immediately when lost circulation occurs to the extent that the hole cannot be kept full of drilling fluid and that drilling is not resumed until adequate circulation has been regained or until approval has been obtained from the Board or any person designated by the Board to continue drilling the well.

Pressure Transition Zone

102. (1) Every operator shall continuously monitor the fluid content and the characteristics of the lithology of the formations being drilled during any exploratory drilling using techniques such that the pressure transition zone between normally and abnormally pressured formations can be detected.

(2) Every operator shall, when a pressure transition zone is detected,

(a) cease drilling;

(b) attempt to verify the presence of the zone; and

(c) take such measures as are necessary to control the anticipated pressures before drilling is resumed.

(3) Where, on the basis of seismic or other data and on the basis of the results observed during the drilling of a well, the existence of an over-pressured zone is indicated to be within the next 100 m of drilling, the operator shall not continue drilling except in accordance with a program approved by the Board or any person designated by the Board.

Directional and Deviation Surveys

103. (1) Every operator shall ensure that deviation surveys are taken at intervals not exceeding 150 m or at the intervals set out in the Approval to Drill.

(2) Every operator shall take directional surveys at sufficiently frequent intervals during the drilling of any well to permit the location of any point in the well-bore to be calculated within 15 m of its actual location.

(3) Except in the case of a relief well, every operator shall ensure that a well is drilled in such a manner that it does not intersect an existing well.

(4) Every operator shall ensure that a directional survey is taken prior to installing a casing string in a well.

Plugging Part of a Well

104. Where the lower portion of any well is to be plugged, the operator shall abandon that portion in accordance with sections 184 to 187 and shall leave a minimum of 30 m of cement in place at the top of the plugged interval unless the operator provides to the Chief data to show that it is not practicable to do so.

Suspension of Drilling Operations

105. (1) Every operator shall ensure that any operation at a drill site ceases as soon as possible where the continuation of that operation

(a) causes or may cause pollution; or

(b) endangers or may endanger the safety of personnel, the security of the well or the safety of the drilling rig, drilling base or drilling unit.

(2) Where an operation has ceased pursuant to subsection (1), the operator shall not resume the operation until it can be resumed safely and without causing pollution.

(3) Where a fatal accident occurs at a drill site, the operator shall suspend every operation associated with the fatality as soon as possible and shall not resume any operation without the approval of the Board or any person designated by the Board.

(4) Every operator shall ensure that any drilling operation in progress at a drill site is suspended where any of the following conditions exist:

(a) an inability to maintain well control;

(b) a failure of any major component of the blowout preventer system, casing or drilling fluid system;

(c) an inability to maintain the properties, volume or circulation rate of the drilling fluid as required by these Regulations;

(d) an inability to maintain on location the quantities of drilling consumables required by section 110;

(e) an uncontrolled fire;

(f) a loss of a significant portion of the primary power;

(g) an inability to safely handle the drillpipe, casing or heavy equipment necessary for the operation in progress;

(h) a diving operation is being conducted near any submerged blowout preventer or wellhead;

(i) an inability to satisfactorily maintain the position of the drilling unit over the well;

(j) an excessive motion of the drilling unit caused by environmental conditions;

(k) a serious and imminent threat of ice or icebergs; or

(l) where a drilling unit is anchored, the tension on any anchor exceeds the values established when the anchor was set.

(5) Where a drilling operation is suspended pursuant to subsection (4), the operator shall not resume that drilling operation until the condition that was the reason for the suspension ceases to exist.

(6) Where during the drilling of a well a formation that is potentially dangerous is likely to be encountered or a potentially hazardous operation is to be undertaken near the end of a drilling season, and it may not be possible to deal safely with the potential danger or hazard before the end of the drilling season, the operator shall suspend drilling operations until the subsequent drilling season.

Inspections and Tests of Equipment

106. (1) Every operator shall ensure that every drilling installation and associated equipment used in a drilling program

(a) are maintained in good working condition at all times during the drilling program; and

(b) are inspected at least annually and a report is prepared in respect of the inspection.

(2) Every operator shall ensure that a comprehensive inspection, that includes magnetic particle, x-ray and ultrasonic surveys of critical joints and structural members, of the structure of every drilling unit used in a drilling program is made at least once in every four year period and a report is prepared in respect of the inspection.

(3) Every operator shall ensure that

(a) subject to paragraph (b), all major components of the blowout preventer system, except the blind rams, are actuated once each day that drilling operations are carried out if

(i) the drill string is out of the hole, or

(ii) the drill bit is within the casing;

(b) where the drill string referred to in paragraph (a) is not out of the hole or the drill bit referred to in that paragraph is not within the casing, all major components of the blowout preventer system, except the blind rams, are actuated at least once every three days that drilling operations are carried out;

(c) the blind rams are actuated at least once each time the drill string is out of the hole;

(d) auxiliary equipment that may be used for well control, including the cementing unit and lines, degasser, hydraulic control lines and inside drillpipe blowout preventers, are available for immediate use;

(e) all fire-fighting and safety equipment required by these Regulations is inspected once each week to confirm that the equipment is serviceable and in its proper location;

(f) all safety cables attached to the kelly hose, tongs, weight indicator or other suspended equipment are inspected, properly secured and serviceable; and

(g) each air-intake shut-off valve or engine flooding system, where required for diesel engines by subsection 41(2), is tested to confirm that it is serviceable

(i) before drilling out the cement plug at the shoe of any casing string,

(ii) before each formation flow test or series of formation flow tests, and

(iii) in conjunction with every blowout prevention practice drill required by paragraph 125(f).

Inspection of Hoisting Equipment

107. Every operator shall ensure that

(a) all lifting and hoisting equipment is inspected at regular intervals and is serviceable;

(b) all cables, slings and other devices used in lifting, transferring or moving loads are inspected before use and replaced if they show signs of wear;

(c) all hoisting machinery on a drilling installation is inspected each year and tested every four years in the manner prescribed by the American Petroleum Institute's API Recommended Practice for Hoisting Tool Inspection and Maintenance Procedures, API RP 8B, as amended from time to time;

(d) all chains, rigs, hooks, blocks and shackles on a drilling installation are operated in accordance with the American Petroleum Institute's Recommended Practice for Operation and Maintenance of Offshore Cranes, API RP 2D, as amended from time to time;

(e) any personnel transfer basket used in respect of a drilling installation is in serviceable condition and any ropes, wires or other vital parts of the basket being used that show signs of significant wear are replaced; and

(f) any cable used to tow a drilling unit is inspected prior to its use and is not used if significant wear is detected.

Electrical Equipment

108. (1) Every operator shall ensure that electrical equipment, electric motors, lighting fixtures and wiring on a drilling unit are designed, installed and maintained to operate safely under the maximum anticipated load conditions.

(2) Every operator shall ensure that the electrical equipment and wiring on any drilling unit used in a drilling program are inspected at intervals not exceeding 18 months and, on request of the Chief, shall provide verification that they meet the requirements of section 30.

Crane Operations

109. (1) Every operator shall ensure that

(a) any loading and unloading of supply vessels and aircraft ceases where the rigging, cable, boom, mountings or stops of the crane used in those operations are found to be in an unsafe condition;

(b) adequate tag lines are used to control any swinging of a load that is being lifted by a crane;

(c) loads are not left hanging above the deck of a drilling installation unless the crane operator is at the controls of the crane; and

(d) where the weight of any load to be lifted by a crane at a drill site is in excess of five tonnes, the weight is clearly marked on the load.

(2) Where any loading or unloading operation has ceased pursuant to paragraph (1)(a), the operator shall not resume that operation unless suitable remedial measures are taken so that it may be resumed safely.

Quantities of Consumables

110. (1) Every operator shall ensure that sufficient quantities of fuel, drilling fluid materials, cement and other drilling consumables are stored on the drill site to meet any normal and reasonably foreseeable emergency condition.

(2) The quantities referred to in subsection (1) shall not, in the case of a drilling installation, be less than

(a) in the case of weight material, 30 m3;

(b) in the case of bentonite or equivalent material, 10 m3;

(c) in the case of cement, 15 m3; and

(d) in the case of usable fuel, 20 m3.

Bulk Handling of Fuel and Consumables

111. Every operator shall ensure that

(a) drilling fluid additives are

(i) stored and handled in a manner that minimizes their deterioration and prevents damage to the natural environment, and

(ii) where bulk transfer systems are not used, packaged in properly labelled containers;

(b) liquid fuel and oils are transported, transferred and stored in a closed system;

(c) liquid fuel stored at or above deck level is contained in a closed and properly vented container that is properly isolated from the well-bore;

(d) all reasonable precautions are taken to avoid spillage while transferring fuel from a supply vessel to a drill site or to a drilling installation; and

(e) when a fuel transfer referred to in paragraph (d) is completed, the transfer hoses used in the transfer are drained into the supply vessel and both hose-ends are securely plugged.

Waste Material

112. Every operator shall ensure that all waste material, drilling fluid and drill cuttings generated at a drill site are handled and disposed of in a manner that

(a) does not create a hazard to safety, health or to the natural environment; and

(b) is approved by the Board or any person designated by the Board.

113. Every operator shall ensure that

(a) any petroleum produced during formation flow tests is stored in suitable tanks or flared in a manner approved by the Board or any person designated by the Board;

(b) where an oil spill occurs, no countermeasures of a chemical nature are used without the approval of the Board or any person designated by the Board unless, during the delay required to obtain the approval, there is a severe threat to the safety of persons, property or the natural environment that can be lessened by such countermeasures;

(c) any waste fuel, oil or lubricant is collected in a closed system that is designed for the purpose; and

(d) any stored waste oil or oily material that is not burned at the drill site is transported to shore in a suitable container and properly disposed of on shore.

114. Every operator shall ensure that

(a) all sewage, galley and other domestic waste material that might contribute to pollution is disposed of in a manner approved by the Board or any person designated by the Board;

(b) combustible trash is not burned at a drill site except where precautions are taken to ensure that the fire does not endanger personnel or the safety of the well;

(c) any spent acid or excess acid is disposed of in a manner approved by the Board or any person designated by the Board; and

(d) all non-combustible trash, including glass, wire, scrap metal and plastics, is transported to a port and properly disposed of at that port.

Radio and Support Craft Procedures

115. Every person in charge of a helicopter, supply vessel or other support craft employed in the carrying out of a drilling program shall inform all passengers of that support craft, at the time of boarding, of the safety rules and procedures applicable to that craft.

116. Every operator shall ensure that all movements of any support craft operating between a drilling installation and the shore are monitored by the person operating the radio station on the drilling installation.

117. Every person in charge of a standby vessel referred to in section 12 shall

(a) maintain open communication channels with the drilling unit;

(b) maintain the standby vessel within such distance from the drilling unit as is approved by the Board or any person designated by the Board; and

(c) stand ready with the standby vessel to conduct rescue operations at any time

(i) that the safety of personnel, the safety of the drilling unit or the safety of the well being drilled by that drilling unit is endangered or is likely to be endangered,

(ii) when there is particular danger of a person falling overboard,

(iii) when a helicopter is landing on or taking off from the drilling unit,

(iv) when diving operations from the drilling unit are in progress, or

(v) when the drilling unit is threatened by ice.

Moving Drilling Units

118. (1) No operator shall set or retrieve the anchor of any drilling unit used in a drilling program when weather or sea conditions are such as to render such an operation unsafe.

(2) Every operator shall ensure that all drillpipe, drill-collars, marine risers or other equipment and any consumables stored on the deck of any drilling unit used in a drilling program are securely tied down during a move or during any adverse weather conditions.

(3) Where a drilling unit used in a drilling program is moved, the operator shall ensure that the anchor buoy pennant lines are securely fastened, whenever practicable, to prevent them from trailing over the side of the drilling unit or in the water.

Anchors

119. (1) Where anchors are used for holding any drilling unit used in a drilling program in position at a well site, the operator shall ensure that each anchor line and anchor is tested, prior to the commencement of drilling operations, to a tension equal to the lesser of

(a) the maximum anticipated tension expected during the time the drilling unit is on the well site; and

(b) the capacity of the winch.

(2) Where a tension load equal to the lesser of paragraphs (1)(a) and (b) cannot be applied to the anchor line, the operator shall take such remedial action as is necessary to ensure that the drilling unit is securely anchored.

Stability

120. (1) Where an operator uses a drilling unit that is not a floating drilling unit in a drilling program, the operator shall ensure that

(a) the mat, legs, footings, hull or piles of the drilling unit and the surrounding seafloor are inspected regularly, where practicable, to confirm that no areas of weakness are developing; and

(b) where scour, build-up of seafloor sediments or any other condition that threatens the stability of the drilling unit occurs, such measures as are necessary to protect the safety of the drilling unit and of the personnel on board are taken.

(2) Where an operator uses a drilling unit referred to in subsection (1), the operator shall not raise or lower the drilling unit if weather, ice or sea conditions make such an operation unsafe.

(3) During the raising or lowering of any drilling unit referred to in subsection (1), the operator shall ensure that only those persons necessary for the operation are on board the drilling unit and that each person on board the drilling unit is awake and is wearing a life jacket.

PART IV

SAFETY AND TRAINING OF PERSONNEL

General

121. Every operator shall ensure that

(a) any operation necessary for the safety of personnel employed at a drill site or on a support craft has priority, at all times, over any other operation on that drill site or support craft;

(b) trained personnel are ready and able to operate any item of equipment; and

(c) safe working methods are followed in all operations during any drilling program.

General Safety

122. Every operator shall require that all personnel on a drilling installation or support craft keep clear of any load that is being hoisted, suspended or lowered and shall ensure that no person is under a mast that is being raised or lowered.

123. Every operator shall ensure that all working areas including walkways, decks, stairs, rig floors and enclosed areas on a drilling installation or support craft are kept clean and tidy and free of waste material, oil and ice.

Training of Personnel

124. (1) Every operator shall ensure that every person employed on a drilling program

(a) receives instruction and training in respect of all operational and safety procedures that that person may be required to carry out during the course of his duties during such employment;

(b) is capable of doing the duties assigned to him; and

(c) is 16 years of age or more and is 18 years of age or more if his duties require him to work on the drill floor.

(2) No operator shall employ an offshore installation manager, drilling supervisor, drilling foreman or tool-pusher on a drilling program unless that person has, once in every three year period, attended a well control school whose standards have been approved by the Board or any person designated by the Board and has achieved a satisfactory rating from that school.

Safety Drills

125. Every operator shall ensure that

(a) a fire drill is held at least once every two weeks at each drill site;

(b) all personnel employed on a drill site are familiar with personal safety and evacuation procedures in respect of the drilling program;

(c) all members of the drill crew and all other persons employed on a drilling program have received full instructions in respect of their assigned duties in the event of an oil spill;

(d) a practice exercise of oil spill countermeasures is held at least once in each year that the operator is engaged in a drilling program;

(e) in the case of a drilling installation, an abandonment drill is carried out at least once each week;

(f) a blowout prevention practice drill is held at least once in each week that the operator is engaged in a drilling program; and

(g) all members of the drill crew are fully instructed in their assigned duties in respect of the prevention of a blowout.

126. Every operator shall post a notice at appropriate locations at a drill site that sets out the details of the emergency procedures to be followed in the event of fire or evacuation of the drill site.

Protection against Poisonous Gas

127. Every operator shall ensure that

(a) every person employed on a drilling program is made aware of the dangers of hydrogen sulphide gas;

(b) every member of the drill crew is familiar with the breathing devices required by paragraph 27(1)(a);

(c) each drilling supervisor is capable of training other personnel in the use and the operation of the hydrogen sulphide gas detectors required by paragraph 27(1)(b);

(d) a person whose duties may require the wearing of a breathing device does not have hair that interferes with the proper functioning of the breathing device; and

(e) every person working in an area where the hydrogen sulphide concentration in ambient air exceeds 15 parts per million by volume wears a breathing device referred to in paragraph (b).

Safety Instructions

128. Every passenger on a helicopter, supply vessel or any other support craft engaged in a drilling program shall comply with all safety instructions received from the person in charge of that support craft.

Rest Period

129. Every operator shall ensure that no person is required to work, as a member of a drill crew,

(a) a shift in excess of 12 continuous hours, or

(b) two successive shifts of any duration unless that person has had at least six hours rest between those shifts,

except where it is necessary to ensure the safety of personnel, the drilling installation or the security of the well.

Protective Clothing

130. Every operator shall ensure that every person employed on a drilling installation wears adequate protective clothing and uses personal safety equipment during the period that person is carrying out his duties.

Safety Belts

131. Every operator shall ensure that a safety belt is worn by each person employed in the derrick or at any other location on a drilling installation where there is a danger of falling.

Life Jackets

132. Every operator shall ensure that a life jacket, life belt or immersion suit is worn by every person working

(a) in the moonpool area of a drilling unit; or

(b) at any other location where there is a danger of falling overboard.

Transfer of Personnel

133. (1) Every operator shall ensure that no basket that is used for transferring personnel to or from a drilling installation is used to transfer cargo except in an emergency.

(2) Every operator shall ensure that the transfer of a person by a basket referred to in subsection (1) takes place only when visibility is good and when weather conditions are such that the transfer can be made safely.

(3) Every operator shall ensure that where a person is transferred in a basket from a drilling installation to a support craft or from a support craft to a drilling installation,

(a) the drilling installation and the support craft are in direct radio contact; and

(b) the person to be transferred is instructed in the safety procedures to be followed and is wearing a life jacket.

(4) Every operator shall ensure that

(a) not more than five persons and their hand luggage are transferred at one time in the basket referred to in subsection (3); and

(b) the raising or lowering of the basket is carried out over the water to the greatest extent practical.

Smoking

134. (1) No person shall smoke on a drilling installation except in those areas designated as smoking areas by the Board or any person designated by the Board.

(2) Notwithstanding subsection (1), no person shall smoke on a drilling installation during any emergency operations or emergency evacuation practice drill.

(3) Every operator shall post no-smoking notices in all areas on the drilling installation that have been designated as no-smoking areas by the Board or any person designated by the Board.

Welding

135. (1) No welder shall commence welding on a drill site unless that welder has obtained approval therefor from the supervisor of the drill site.

(2) No supervisor shall grant the approval referred to in subsection (1) unless there is adequate ventilation and fire-fighting equipment in the area where the welding is to take place and the welding operation can be carried out safely.

(3) Every operator shall ensure that a welding operation is not conducted in an area where combustible gases may be present until the area is examined with a detector and found to be safe.

Impaired Abilities

136. No person shall be engaged in any activity related to a drilling program while that person's ability to perform his duties is impaired by fatigue, illness, alcohol, drugs or any other condition or substance.

Corrosive Material

137. Every operator shall ensure that

(a) every container used for corrosive material is constructed of material resistant to corrosion;

(b) every container holding corrosive material is handled in a manner that minimizes the danger of spillage;

(c) where caustic soda is added to the drilling fluid, only safe equipment designed for that purpose is used;

(d) any person handling caustic soda or other corrosive material wears a safety hood or goggles; and

(e) empty containers in which caustic soda or other corrosive materials have been packaged are tightly wrapped in a protective covering or otherwise safely packaged before being transferred from a drilling installation to a supply vessel.

138. Every operator shall ensure that every drilling installation is fitted with an eyewash station located in or near the mud mixing facilities.

139. Every person, when preparing, sampling or using acid solutions or inspecting acid containers, shall wear suitable protective clothing, goggles and shields.

Explosives

140. Every operator shall ensure that

(a) a detonator for explosives is not stored with any explosives;

(b) all detonators and explosives are stored in a dry secure location;

(c) a detonator of one type is not stored with a detonator of a different type;

(d) not more than 75 kg of explosive material, including detonators of any type, is stored on a drilling installation; and

(e) any electrical equipment installed or used in an explosives storage room is explosion-proof.

Radioactive Substances

141. Every operator shall ensure that

(a) every person using radioactive substances at a drill site is licensed by the Atomic Energy Control Board; and

(b) the procurement, containment, transportation, use, storage and disposal of all radioactive substances used at a drill site is in accordance with the provisions of the Atomic Energy Control Act and the regulations thereunder.

142. Every operator shall ensure that the containment, use and certification of any equipment used at a drill site that emits radiation is in accordance with the requirements of the Radiation Emitting Devices Regulations.

PART V

OPERATIONAL RECORDS AND REPORTS

Safety and Well Evaluation Information

143. (1) Every operator shall record any information obtained during the drilling program that is relevant to the safety of the program or to the evaluation of the well at the time the information is obtained in a suitable book or log kept at the drill site.

(2) Every operator shall submit to the Chief any report regarding applied research work or studies obtained or compiled by the operator that contains information relevant to the safety of drilling operations in the area set out in the application for Drilling Program Authorization as soon as the report is available.

Reference for Well Depths

144. (1) Every operator shall measure any depth in a well during the drilling or on the termination of the well from a single reference point.

(2) The reference point referred to in subsection (1) shall be either the rotary table or the kelly bushing of the drilling rig.

(3) The operator shall measure and record immediately prior to spud-in

(a) the distance from the rotary table or the kelly bushing to the seafloor at the mean lower low water level; and

(b) the water depth at the mean lower low water level.

Notification of Significant Situation or Significant Event

145. (1) Every operator shall notify the Chief immediately, by the most rapid and practical means, of any significant situation or significant event, including the loss of life, a missing person, serious injury to a person, fire, loss of well control, an imminent threat to personnel or to the safety of a drilling unit, drilling rig or drilling base, an oil or toxic chemical spill or the anticipated discovery of petroleum.

(2) Every operator shall submit a full written report of a situation or event referred to in subsection (1) to the Chief as soon as practicable following the notification required by that subsection.

Notification to Conservation Engineer

146. Every operator shall, within 24 hours, notify a conservation engineer, by telex, telegram or by an equivalent means, of the

(a) date that a drilling unit arrives at any drill site;

(b) hour and date of a spud-in or of the re-entry of any well for the purpose of further drilling; and

(c) hour and date that any drilling rig is released from a well.

Submission of Survey Plan

147. Every operator shall submit to the Chief, in triplicate, a plan of any legal survey made pursuant to section 74 as soon as practicable.

Tour Sheets and Barge Reports

148. Every operator shall ensure that a comprehensive record of the drilling operation and of observations of the natural environment is maintained during a drilling program in the form of tour sheets and, where applicable, daily ship or barge reports.

149. (1) Every operator shall ensure that the tour sheets referred to in section 148 are kept during the period any drilling rig is engaged in any drilling program or well completion.

(2) Every operator shall submit a legible copy of the tour sheets referred to in section 148, signed by or on behalf of the operator, to the Chief at least once each week.

(3) Every operator shall ensure that a legible copy of the tour sheets referred to in section 148 for each well is kept on the drilling installation during any time drilling operations are being carried out.

(4) Every operator shall ensure that the following information is recorded on the tour sheets referred to in section 148:

(a) the distance from the rotary table or the kelly bushing to the seafloor at the mean lower low water level;

(b) the time spent by the drill crew at each separate operation carried out during the drilling program;

(c) the volume of the drilling fluid in surface tanks that is available for use and the properties of and the materials added to the drilling fluid;

(d) the pumping pressure, the circulating rate of the drilling fluid, and any loss of the drilling fluid in the well;

(e) the make-up of all drilling assemblies including the size and type of bit, and the size, number and length of all tubulars;

(f) the increase in the depth of the well made by drilling or coring in each shift of a drill crew;

(g) the weight on the bit and rotary table speed;

(h) particulars of the taking of any deviation surveys or directional surveys and the results thereof;

(i) particulars of the running and cementing of any casing, including the type and quantity of casing and cement;

(j) the results of any pressure test or function test of the blowout preventer system;

(k) the results of any pressure test on casing, open formations or packers;

(l) particulars of any wireline logging operations, including the type of wireline log run;

(m) details of any safety meeting held;

(n) details of any blowout prevention or abandon-ship practice drill held;

(o) particulars of the failure of or significant damage to any equipment that affects the drilling operations;

(p) details in respect of the accidental spillage of any fuel, drilling fluid or other material;

(q) details of any apparent gain in volume of the drilling fluid at the surface and the steps taken to control any kick that may have been encountered;

(r) particulars of the perforating of any casing including the number of perforations and the intervals thereof;

(s) particulars of the stimulating of any formation including the type and quantity of the fluid used and the pressure and rate at which the fluid was injected into the formation;

(t) particulars of the running of any formation flow test;

(u) details of the recovery by wireline of any formation sample or formation fluid sample;

(v) particulars in respect of the loss of any tubulars or other material in the well and a description of any operations undertaken for their recovery;

(w) particulars of the suspension of operations for any cause; and

(x) details in respect of the termination of the well.

(5) Where any drilling rig is being used for a well completion, re-completion or a remedial operation, the operator shall ensure that the information recorded on the tour sheets includes, in addition to the information required by subsection (4),

(a) a summary of the operations undertaken;

(b) the amounts of workover fluids used, injected, lost or recovered from the well;

(c) details of any casing or tubing used in the completion;

(d) results of any tubing and packer pressure tests;

(e) the landing depths for any tubing or casing packers and the depths of any seats; and

(f) details of any recovered fluid and of any fluid levels observed during swabbing operations.

(6) Every operator shall submit to the Chief at least once a week a summary of any work performed on a well during a drilling program by a work barge, support vessel or other similar equipment.

150. The operator shall observe and record on the daily ship or barge report referred to in section 148

(a) the presence of any ice floes or icebergs and their movement;

(b) at least once every three hours,

(i) the wind direction and speed,

(ii) the wave direction, height and period,

(iii) the swell direction, height and period,

(iv) the current direction and speed,

(v) the barometric pressure and air temperature,

(vi) the sea water temperature, and

(vii) the visibility; and

(c) the amount of precipitation in the preceding 24 hour period.

151. Where the drilling unit is a floating unit, the operator shall

(a) observe and record at least once every six hours, where the wind speed does not exceed 35 km/h, and at least once every three hours, where the wind speed exceeds 35 km/h,

(i) the pitch, roll and heave of the drilling unit, and

(ii) the tension on every anchor line;

(b) observe and record during the drilling program the fluid level of every ballast, fuel and drill water tank at least once

(i) every four hours, where the drilling unit is of the semi-submersible type, and

(ii) every 24 hours, where the drilling unit is a drillship; and

(c) calculate and record the vertical centre of gravity of the drilling unit at least once

(i) every 24 hours, where the drilling unit is of the semi-submersible type, and

(ii) every seven days and re-assess that calculation every 24 hours, where the drilling unit is a drillship.

Daily Records

152. Every operator shall ensure that

(a) a daily record is kept of all persons employed at or visiting a drill site; and

(b) a barge log or ship's log is maintained, in respect of a drilling installation, that records

(i) the arrival and departure of any support craft,

(ii) the location and deployment of any standby vessel,

(iii) the dispatch and receipt of any radio message,

(iv) the details of any emergency drills,

(v) any change in the draft, and

(vi) the particulars of any inspection of the hull.

Routine Reports

153. (1) Every operator shall, during a drilling program, prepare and submit to the Chief once each week

(a) a summary of all significant situations and significant events as described in subsection 145(1) that occurred at the drill site during the preceding week;

(b) a report describing the lithology of any formation drilled and the nature of any reservoir fluids encountered during the preceding week; and

(c) a summary of the results of any deviation surveys and directional surveys that were taken during the preceding week, including a calculation of the bottom-hole coordinates for any well that was directionally drilled or that has deviated more than five degrees from the vertical.

(2) Every operator shall, during a drilling program, submit a report to the Chief each day, by telex, telegram or by an equivalent means, setting out the depth of the well, the lithology of the formations encountered during the previous day, the properties of the drilling fluid, the results of each formation leak-off test, the weather and, where applicable, sea conditions, and the performance of the drilling installation.

(3) Every operator shall ensure that a record is maintained on the drill site of the receipt and consumption of all explosive material at the drill site and that the record is submitted on request to the Chief.

Downhole Survey Record

154. (1) Every operator shall ensure that every wireline log or other survey made in a well

(a) is recorded at a scale that provides a degree of sensitivity appropriate to the measurements being taken; and

(b) has recorded thereon a description of any tool calibration or other data that is necessary in the interpretation of the wireline log or other survey.

(2) Every operator shall

(a) submit to the Chief, by the most rapid and practical means, two field-print copies of all wireline logs run by that operator;

(b) submit, to the Chief on request, wireline logs in digital form if they have been prepared in that form; and

(c) submit, to the Chief on request, all wireline log data in respect of a well before the well is terminated.

Penetration and Gas Content Records

155. Every operator shall submit the record of the rate of penetration made in accordance with subsection 99(1) and the record referred to in subsection 164(2) to the Chief on request.

Formation Flow Records

156. (1) Every operator shall submit to the Chief forthwith any records made in accordance with section 174 or 175.

(2) The records referred to in subsection (1) shall include accurate reproductions of any pressure and flow charts except where accurate reproductions cannot be made, in which case the original charts shall be submitted.

(3) Where original charts are submitted pursuant to subsection (2), the Chief shall return the charts to the operator within thirty days after the day the Chief received them.

Report of Structural Faults

157. (1) Every operator shall submit to the Chief a written report on any inspection made in accordance with section 106 within fifteen days after the day the report is completed.

(2) Every operator shall notify the Chief immediately if an inspection of a drilling installation or of any vessel engaged in the drilling program reveals conditions that lessen or might lessen the structural integrity of the drilling installation or vessel.

Well Termination Record

158. (1) Every operator shall record the details of the manner in which a well has been terminated and shall submit the record to the Chief within 21 days after the rig release date in respect of the well.

(2) The record referred to in subsection (1) shall, if requested by the Chief, be accompanied by a sketch illustrating the condition of the well after termination.

Press Releases

159. Where an operator issues a press release concerning any discovery, blowout or other significant event that occurs at a well, the operator shall simultaneously transmit to the Chief by telex or telecopier a copy of the press release.

PART VI

WELL EVALUATION

General

160. (1) Every operator shall obtain sufficient well tests, wireline logs, analyses, surveys and samples during the drilling of a well to ensure that a comprehensive geological and reservoir evaluation can be made.

(2) Where permafrost exists in a well, the operator shall, if requested by the Chief, determine the approximate depth of the base of permafrost by running a temperature survey or other wireline log or by such other method as may be specified by the Chief.

Drill Cuttings

161. (1) Subject to subsection (2), every operator shall ensure that samples of drill cuttings are collected from those portions of the well set out for that purpose in the Approval to Drill.

(2) Where an operator cannot obtain samples from a portion of the well as required by subsection (1) for any reason, the operator shall record the depth interval for which samples were not obtained and the reason therefor and submit the record to the Chief.

Cores

162. (1) Every operator shall ensure that conventional cores are taken in accordance with the program contained in the Approval to Drill unless it is not operationally practicable.

(2) Every operator shall advise the Chief, as soon as possible, of any case where it is not practicable to take the cores referred to in subsection (1).

(3) Every operator shall ensure that any core taken pursuant to subsection (1) is

(a) extracted from the core-barrel in accordance with good oilfield practice;

(b) described immediately in accordance with good geological practice;

(c) where the nature of the core is amenable, marked in a way that identifies the depth interval from which the core was obtained and the orientation that the core had prior to its removal from the formation; and

(d) placed in a core container.

(4) Every operator shall ensure that a core container referred to in paragraph (3)(d) is

(a) sufficiently strong to protect the core from breakage;

(b) approximately 800 mm in overall length; and

(c) accurately and durably labelled with the name of the well, the depth interval from which the core was obtained and the sequential number of the container.

(5) The labelling information required by paragraph (4)(c) and subsection 163(2) may be given in coded form.

163. (1) No person shall extract a sidewall core from a core gun before the firing head of the core gun has been removed.

(2) Every operator shall ensure that any sidewall core obtained is described immediately in accordance with good geological practice and is placed in a suitable container that is accurately and durably labelled with the name of the well and the depth interval from which the core was obtained.

Gas Content of Drilling Fluid

164. (1) Every operator shall, where a gas detection device is required by paragraph 60(3)(e), sample and test all drilling fluid returning to the surface to determine the total hydrocarbon gas content and, where the device has the capability, the relative amounts of any methane, ethane, propane and butane gas.

(2) Every operator shall record the results of the sampling and testing referred to in subsection (1).

Wireline Logs

165. (1) Subject to section 168, every operator shall ensure that wireline logs that are necessary for the proper evaluation of any well are taken over all uncased intervals in the well below the surface casing.

(2) For the purposes of subsection (1), every operator shall take sufficient wireline logs in any well to

(a) permit an accurate calculation of the porosity, fluid saturation and fluid contact for all potential reservoirs;

(b) measure the size of the hole and the spontaneous potential and natural radioactivity of any formation;

(c) assist in determining the lithology of any formation; and

(d) permit the calculation of accurate values of the vertical angle and direction of the hole and of the structural dips of the formations.

(3) Every operator shall ensure that the wireline logs referred to in subsection (2) yield data of good quality by having them taken

(a) as soon as practicable after penetrating a potential reservoir;

(b) before altering the nature of the drilling fluid in a manner that would affect the quality of the wireline logs;

(c) before enlarging the diameter of the hole for the purpose of installing casing; and

(d) at sufficiently frequent time intervals during the drilling of a well that the nature of the formation fluids adjacent to the well-bore has not been significantly altered by invasion of the drilling fluid.

(4) For the purposes of subsection (1), every operator shall take a sufficient number of types of porosity-measuring wireline logs in any well so that any effect of shaliness, hydrocarbons, complex lithology and the walls of the hole can be compensated for in determining the porosity of any formation.

(5) Unless otherwise permitted in the Approval to Drill, every operator shall take at least two types of porosity-measuring wireline logs if significant reservoir development is indicated in the portion of the hole in which the wireline logs are to be taken.

(6) For the purposes of subsection (1), every operator shall take a sufficient number of types of resistivity-measuring wireline logs in any well so that the distortion caused by filtrate invasion, thin beds, the drilling fluid and the walls of the hole can be compensated for in calculating the formation resistivity.

166. Subject to section 168, every operator shall take wireline logs in the hole drilled for the surface casing when the requirement to do so is stated in the Approval to Drill.

167. Where any wireline log referred to in section 165 is taken, the operator shall ensure that

(a) the maximum bottom-hole temperature is measured with at least two maximum-recording thermometers; and

(b) the formation temperature, the time that the circulation of the drilling fluid stopped and the time that the wireline log instrument left the bottom of the hole is recorded on the wireline log.

168. Where the formations in a well are composed of salt or non-sedimentary rock, only those wireline logs that are necessary to measure the diameter of the hole, the radioactivity of the formation and sonic transit time of the formation are required.

169. (1) Every operator shall ensure that every wireline log referred to in sections 165 and 166 is taken at a rate that yields good quality data and does not cause formation fluids to be swabbed into the well.

(2) Where conditions in a well are such that the taking of any wireline log referred to in section 165 would endanger the safety of any person, the well or the drilling rig, the operator shall defer the taking of that wireline log until the conditions are such that the taking of the wireline log can be done safely.

(3) Where the taking of a wireline log is deferred under subsection (2), the operator shall

(a) immediately notify a conservation engineer of the deferment;

(b) submit a program, for approval by the Board or any person designated by the Board, detailing the procedures to be used to obtain the information that would have been obtained from the deferred wireline log; and

(c) follow the procedures referred to in paragraph (b), if approved.

(4) Where a well is being drilled from a floating drilling unit, the operator shall use a motion-compensator device during the taking of any wireline log referred to in section 165 if the vertical motion of the drilling unit is such that the quality of the data would otherwise be adversely affected.

Testing and Sampling of Formations

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

SOR/2006-282, s. 1.

Formation Flow Test

171. (1) An operator may conduct a formation flow test on a well drilled on a geological feature if, prior to 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.

(2) The Board shall approve a formation flow test if it determines that the test will be conducted safely 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.

(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 such a test would contribute substantially to the geological and reservoir evaluation.

SOR/2006-282, s. 1.

172. (1) Every operator shall ensure that during any formation flow test no formation fluids are allowed to flow to the surface or are circulated to the surface unless there is adequate illumination in the vicinity of the test tree, flow lines and test tanks.

(2) Where a well is being drilled from a floating drilling unit, every operator shall ensure that a formation flow test in respect of that well is not conducted

(a) with a packer set in an interval of the well that is not protected by casing,

(b) when the unit is heaving or likely to heave more than one and one-half metres during the test, or

(c) without adequate illumination,

unless the formation flow test has been approved by the Board or any person designated by the Board.

(3) Every operator shall ensure that before starting any formation flow test

(a) all safety equipment and fire protection equipment is inspected and found ready for immediate use;

(b) where the test is to be conducted in an interval of a well that is protected by casing, the annulus between the test string and the casing is pressure tested to confirm that the packer will withstand pressure from above the packer;

(c) all sections of the flow test equipment are pressure tested to at least the maximum pressure to which that equipment may reasonably be expected to be subjected during the test; and

(d) the captain of the standby vessel is informed that the test is to be conducted.

173. Every operator shall ensure that

(a) during any formation flow test, all flow rates and pressures are measured and controlled;

(b) any well fluid produced during a formation flow test is

(i) sampled to determine if it contains hydrogen sulphide gas,

(ii) monitored to determine if it contains a significant amount of sand, and

(iii) stored and disposed of in accordance with section 113;

(c) any formation flow test is stopped immediately where

(i) hydrogen sulphide gas is present, or

(ii) significant sand erosion is occurring,

unless precautions have been taken to ensure the safety of personnel and the control of the well; and

(d) after the completion of a formation flow test and prior to pulling the test string used to conduct the test out of the well, any formation fluid in the test string is circulated to the surface or is otherwise recovered.

174. Every operator shall ensure that

(a) all relevant information in respect of any formation flow test is properly recorded; and

(b) the information referred to in paragraph (a) includes, if available,

(i) the initial shut-in pressure,

(ii) all flow rates and pressures and the time at which each measurement was taken,

(iii) sufficient build-up pressure and flowing pressure data to calculate the permeability and the static reservoir pressure,

(iv) the total volume of fluid recovered and the volume of each type of fluid produced, and

(v) the temperature and pressure in the well at the point and at the time any fluid sample was taken.

175. (1) Every operator shall ensure that any formation flow test taken by wireline is designed and conducted to obtain the maximum amount of reservoir fluid practicable under the circumstances and that the information in respect of the test is recorded.

(2) The information referred to in subsection (1) shall include

(a) the name of the well and the depth from which the fluid sample was obtained;

(b) the date and time the fluid sample was obtained;

(c) the temperature of the formation from which the fluid was obtained;

(d) a record of the well pressure during the test; and

(e) the type, quality and nature of the fluids recovered.

176. (1) Every operator shall ensure that, during a formation flow test, a sample of each type of fluid produced, including condensate, is collected in a sufficient volume and using techniques that permit the analyses referred to in section 199.

(2) Every operator shall place any sample referred to in subsection (1) in a sealed container at the drill site.

(3) The container referred to in subsection (2) shall be

(a) constructed of a material that ensures that the sample can be safely transported; and

(b) numbered, properly labelled and accompanied by information setting out

(i) the name and depth of the well,

(ii) the date and the means by which the sample was obtained, and

(iii) where applicable, the type and the number of the formation flow test.

PART VII

WELL OR TEST HOLE TERMINATION

Approval to Terminate

177. No person shall terminate a well or test hole without an Approval to Terminate that well or test hole granted by the Board or any person designated by the Board under this Part.

Application for Approval

178. An operator may apply for an Approval to Terminate a well or test hole by completing and forwarding an application to the Board.

Removal of Casing

179. (1) An operator shall not permanently remove any casing or tubing while abandoning a well unless the removal is permitted by the Approval to Terminate and is carried out in accordance with subsection (2).

(2) Where the casing referred to in subsection (1) is removed,

(a) a bridge plug shall be set in the casing not more than 15 m below the cut-off point prior to cutting the casing;

(b) subject to paragraph (d), a 30 m cement plug shall be placed across the casing stub;

(c) that portion of the well above the cut-off point shall be abandoned in accordance with this Part; and

(d) where casing is cut for the purpose of recovering a wellhead, a cement plug that is as long as practicable shall be placed across the casing stub.

180. Every operator shall ensure that on the termination of any well the seafloor is cleared of any material or equipment that could interfere with other commercial uses of the sea, unless the Board or any person designated by the Board, having been satisfied that no interference with the commercial use of the sea is reasonably likely to result, otherwise approves.

Drilling Rig Removal Prohibited

181. No operator shall remove a drilling rig from a well drilled under these Regulations unless the well has been terminated in accordance with the Approval to Terminate and this Part.

Operator Responsible for Abandoned Wells

182. Every operator shall ensure that

(a) a well or a portion of a well that is not suspended or completed is abandoned; and

(b) where a well or a portion of a well is abandoned, the well is abandoned in such a manner that any formation fluid is prevented from flowing through or escaping from the well-bore.

183. (1) An acknowledgement by the Chief of a well termination record submitted in accordance with subsection 158(1) shall in no way relieve an operator of the responsibility for a proper termination of the well if, at a later date, the termination of the well is found not to be in accordance with these Regulations.

(2) Where the Chief is informed that a well or a portion of a well has not been terminated in accordance with these Regulations, the Chief may order the operator of the well to properly terminate the well and may specify the period within which the proper termination of the well is to be carried out.

Location of Abandonment Plugs

184. (1) Where a well or a portion of a well is abandoned, the operator shall ensure that

(a) where practicable, a cement plug is set at the bottom of the well except where

(i) the formation at the bottom of the well is salt, in which case the bottom cement plug may be set immediately above the top of the salt formation, or

(ii) conditions in the borehole of the well are such that it is not practicable to set a cement plug at the bottom of the well, in which case the bottom cement plug shall be set as deep in the well as is practicable;

(b) cement plugs and bridge plugs are set in accordance with the Approval to Terminate and are designed to

(i) isolate formations or groups of formations that appear to have abnormal pressures,

(ii) separate porous permeable formations that contain formation fluids that are significantly different in nature from each other,

(iii) separate porous permeable formations from other porous permeable formations that are significantly different in age, and

(iv) separate lost circulation intervals in the well from other porous permeable formations;

(c) unless at least 10 m of cement is left in the bottom of the deepest casing string during cementation and the cement is not drilled out,

(i) the well is plugged with

(A) a cement plug that is at least 30 m in length and extends at least 15 m below and 15 m above the shoe of the deepest casing string, or

(B) a bridge plug that is set in the casing within 100 m of the bottom of the deepest casing string, and

(ii) the plug is tested to a pressure equal to the formation leak-off test pressure described in subsection 97(2) plus 3 500 kPa;

(d) where a leak exists or is suspected in the innermost casing string, a cement plug is set at the time of abandonment to seal the leak;

(e) where any annulus is open to a formation, a cement plug is set to seal that annulus;

(f) a cement plug is placed on a bridge plug set at a depth of not more than 150 m below the seafloor or squeezed through a retainer placed at a depth of not more than 150 m below the seafloor; and

(g) all casing is cut off below the seafloor at a depth below which damage by ice scour cannot reasonably be expected or one metre, whichever is the greater.

(2) Every operator shall perforate any casing installed in a well in order to place cement between porous permeable zones if the zone would not otherwise be isolated.

185. (1) Except in a development well, every operator shall ensure that every interval in a casing string that has been perforated for flow testing or any other purpose is plugged prior to perforating any other interval in the casing string.

(2) Where the perforated intervals referred to in subsection (1) are in formations that contain petroleum or abnormal fluid pressures, the operator shall plug them

(a) by setting a bridge plug not more than 30 m above the top perforation and by placing not less than 5 m of cement on the bridge plug;

(b) by squeezing cement into the perforations and then testing the plug to a pressure of not less than 7 000 kPa above the formation fluid pressure in the interval; or

(c) by setting a cement plug not more than 30 m above the top perforation and not less than 30 m in length.

(3) Notwithstanding subsection (2), where the interval that is perforated is the uppermost perforated interval in a well, the operator shall place in the casing a cement plug, the base of which is not more than 30 m above the upper limit of the perforations and the length of which is not less than 30 m.

Length and Quality of Cement Plugs

186. (1) Every operator shall ensure that the cement plugs referred to in paragraph 184(1)(b), unless otherwise permitted in the Approval to Terminate, are not less than

(a) 100 m in length, where they are set in a portion of the well that is not protected by casing; and

(b) 30 m in length, where they are set in a portion of the well that is protected by casing.

(2) Every operator shall ensure that the cement used for any cement plugs is designed to have a minimum compressive strength of 3 000 kPa after it has hardened for at least eight hours.

Feeling for Plugs

187. (1) Every operator shall wait for at least six hours for the cement used for plugs to harden and shall then confirm with a force of 90 kN or the full weight of the cementing string, whichever is the lesser, the position of any cement plug that is not supported by a plug or by the bottom of the well and that is located

(a) at the shoe of the deepest casing string;

(b) above an abnormally-pressured zone; or

(c) above a hydrocarbon-bearing zone.

(2) Where a plug is so displaced from its intended position as to render it inadequate for the purpose for which it was intended, the operator shall set a supplementary plug to replace it and shall confirm the position of the supplementary plug in accordance with subsection (1).

Termination of Shallow Holes

188. Every operator shall ensure that any hole drilled to a depth of less than 30 m is plugged with a cement plug at the surface before the drilling equipment is removed from the site.

Marking of Wellheads

189. Every operator shall ensure that the wellhead of any suspended or completed well is

(a) protected against damage; and

(b) equipped with a device that will permit it to be easily located.

Fluid in Completed, Abandoned or Suspended Wells

190. Every operator shall ensure that

(a) where a well or an interval in a well is to be abandoned or suspended, the well or interval is filled with fluid of sufficient density to over-balance the formation pressures found in the well; and

(b) any fluid to be placed in the casing-tubing annulus of a well that is to be suspended or completed is fluid that

(i) will not freeze under the conditions to which it will be subjected, and

(ii) is treated to minimize corrosion of the casing and tubing.

Suspended Wells

191. (1) Every operator shall ensure that every well drilled by the operator that is suspended is left in such a condition that

(a) any formation fluid is prevented from flowing through or escaping from the well-bore;

(b) any seafloor obstruction is minimized; and

(c) a wellhead can be installed and operations can be safely and efficiently resumed.

(2) Every operator shall ensure that every well referred to in subsection (1) that is suspended after it is completed is equipped with a down-hole mechanical plug and a surface mechanical plug in the tubing that are pressure tested to ensure that they are properly installed.

192. (1) Every operator of a well that is suspended and that has not been completed shall complete or abandon that well within six years after the date of suspension.

(2) Every operator of a well that is completed and suspended shall

(a) inspect the well each year and report on the condition of the well to the Chief; and

(b) place the well on production or abandon the well within a period of six years after the date of suspension unless the Chief has granted an extension of that period.

Well Completion

193. (1) Subject to subsection (2), where the operator intends to complete a well, the operator shall submit, in the application for an Approval to Terminate, a well completion program that provides for

(a) the isolation of each completed reservoir interval from any other porous or permeable interval penetrated by the well;

(b) the safe and efficient testing and production of any completed reservoir interval;

(c) where open-hole completion techniques are used, the installation of production casing at a depth that is not more than 60 m above the top of the productive interval;

(d) where cased-hole completion techniques are used, the installation of production casing at a depth that provides a sump of at least 15 m below the base of the productive interval;

(e) the setting of a packer as close as practicable to the top of the interval to be completed and the pressure testing of that packer to a differential pressure that is at least 4 000 kPa greater than the maximum differential pressure anticipated under production conditions;

(f) the stimulation of productive formations in a manner that is safe and that permits evaluation of production characteristics; and

(g) the measurement and control of the amount of sand flowing into the well.

(2) Every operator shall terminate a well in accordance with the terms and conditions of the Approval to Terminate.

(3) Every operator shall ensure that the wellhead and related equipment on a completed well

(a) has a working pressure that is greater than the initial reservoir pressure in any productive interval;

(b) is pressure tested to a pressure that is not less than the initial reservoir pressure in any productive interval; and

(c) has installed thereon a means of monitoring

(i) the pressure and temperature at the tubing-head, and

(ii) the pressure at the casing-head.

(4) Every operator shall install a surface-controlled subsurface safety valve in a well that has been completed.

PART VIII

DEPOSITION OF SAMPLES FROM A WELL

General

194. When submitting any information for the purposes of the Act, these Regulations, or any other regulations made under the Act, an operator shall refer to each well by the name assigned by the Chief.

195. (1) Every operator shall ensure that every sample of a drill cutting, a core or sample of well fluid that is taken from a well in compliance with these Regulations is transported and stored in a manner that prevents any loss or deterioration of the cutting, core or sample.

(2) No operator shall transport

(a) any sample of well fluid that is collected for purposes of analysis in a plastic container or in any other container that may cause or permit the chemical properties of the sample to be significantly altered; or

(b) any sample of gas the pressure of which is greater than the pressure rating of the gas container.

Drill Cuttings

196. (1) Subject to subsection (2), every operator shall, to the extent practicable, ensure that

(a) subject to paragraph (d), a portion of each sample of drill cuttings collected in accordance with section 161 is washed and dried

(i) to remove any drilling fluid or other contaminants, and

(ii) in a manner that minimizes any change in the natural appearance or lithological characteristics of the cuttings;

(b) the portion referred to in paragraph (a) is of sufficient volume to fill two vials;

(c) the vials referred to in paragraph (b) are transparent and are accurately and durably labelled with the name of the well and the depth interval from which the drill cuttings were obtained;

(d) at least 500 g of each sample of drill cuttings referred to in paragraph (a) are left unwashed and are placed in a moisture-proof container; and

(e) the container referred to in paragraph (d) is durably labelled with the name of the well and the depth interval, which may be coded, from which the sample was taken.

(2) Where it is not practicable to comply with subsection (1), the operator shall process the samples the operator has obtained in the manner approved by the Board or any person designated by the Board.

Sidewall Cores

197. Every operator shall store any sidewall core material remaining after petrographic, reservoir, paleontological, palynological or other analyses have been conducted in containers that are durably labelled with the name of the well and the depth from which the core was obtained.

Conventional Cores

198. (1) Every operator shall ensure that

(a) every conventional core is analysed to determine the basic reservoir characteristics of all potential reservoir intervals in the core;

(b) the analysis referred to in paragraph (a) includes the measurement of at least the following characteristics, namely,

(i) porosity,

(ii) permeability, in the vertical direction and in the direction of maximum horizontal permeability and in the direction normal to the direction of maximum horizontal permeability, and

(iii) fluid saturation; and

(c) where any samples necessary for the analysis referred to in paragraph (a) have been removed from the core, the remaining core or a longitudinal slab of the core that is not less than one half of the cross-sectional area of the core is submitted to the Chief.

(2) Every operator shall store at a location in Canada every core or portion of a core not submitted to the Chief pursuant to paragraph (1)(c), for a period of not less than two years after the date of abandonment of the well from which the core was taken.

(3) Every operator shall, before disposing of a core or a portion of a core referred to in subsection (1), notify the Chief in writing and give the Chief an opportunity to request delivery to the Chief of that core or portion.

Analysis of Fluid Samples

199. (1) Every operator shall ensure that

(a) each sample of gas, condensate, oil or water obtained from a well is analysed to determine

(i) its density, and

(ii) its constituent compounds and the relative proportion of each of the compounds;

(b) each sample of gas referred to in paragraph (a) is analysed to determine

(i) its gross heating value in the dry acid-free condition, and

(ii) its pseudo-critical temperature and pressure;

(c) the viscosity of each sample of oil referred to in paragraph (a) is measured at two different temperatures with a variance of at least 20°C;

(d) the resistivity and pH of each sample of water referred to in paragraph (a) is measured; and

(e) where a well produces more than one fluid phase, the analysis of a recombined sample is made to determine the physical and chemical factors that affect the performance of the reservoir of the well.

(2) The result of any analysis or measurement referred to in subsection (1) shall be reported in units specified by the Chief.

Delivery of Samples and Other Materials to Chief

200. Every operator shall deliver to the addresses specified by the Chief

(a) all samples and other materials that are required to be submitted under these Regulations;

(b) within 60 days after the rig release date of any well

(i) two complete sets of the washed drill cutting samples referred to in paragraph 196(1)(a), and

(ii) a complete set of the unwashed drill cutting samples referred to in paragraph 196(1)(d);

(c) within six months after the rig release date, any sidewall core or any remnant thereof remaining after any analyses of the core;

(d) within 60 days after the rig release date, any conventional core required to be submitted pursuant to paragraph 198(1)(c);

(e) within 60 days after the date of the formation flow test, any fluid sample referred to in section 176;

(f) within six months after the rig release date, any palynological or nano-fossil slide produced from a sidewall core that was destroyed in the production of the slide; and

(g) within five years after the rig release date, any foraminiferal or petrographic slide produced from a sidewall core that was destroyed in the production of the slide.

PART IX

FINAL WELL REPORTS

Exploratory and Development Wells

201. (1) Every operator shall prepare a final well report on termination of a well for every well drilled by the operator and shall submit the report to the Chief within a period of 90 days after the rig release

date in the case of an exploratory well and within a period of 45 days after the rig release date in the case of a development well.

(2) The final well report referred to in subsection (1) in respect of an exploratory well shall contain a record of all operational, engineering and geological information that is relevant to the well and shall be organized into the following sections, with appendices, where appropriate:

(a) an introduction;

(b) general well data;

(c) a summary of drilling and related operations;

(d) a summary of weather, ice conditions and sea state and of the response performances of the drilling unit in extreme conditions;

(e) geological and palaeontological information;

(f) a summary of directional and deviation surveys and the coordinates of the bottom of the hole;

(g) a plot of the location of the bore-hole in the case of a well that has deviated more than ten degrees from the vertical;

(h) reservoir and well evaluation data; and

(i) any wireline logs, analyses, studies and all other pertinent reports.

(3) The final well report referred to in subsection (1) in respect of a development well shall contain the following:

(a) a summary of the completion operations;

(b) the coordinates of the bottom of the hole and of the top of any productive zone and, in the case of a directionally-drilled well, a plot showing the location of the well-bore;

(c) details of the completion equipment and tubing including a diagram of equipment installed on the well;

(d) results of any formation flow test;

(e) a copy of any report prepared by contractors of the operator respecting well stimulation; and

(f) any wireline logs, core analyses, studies, reports or records relating to the evaluation of the well.

Test Holes

202. (1) Every operator shall prepare a final report on the drilling of any test hole or group of test holes drilled by the operator.

(2) An operator shall submit the report referred to in subsection (1) to the Chief within a period of 90 days after the rig release date of the test hole or group of test holes unless a different period is approved by a conservation engineer.

(3) The final report referred to in subsection (1) shall contain a record of all operational and engineering information that is relevant to the test hole and shall be organized into the following sections, with appendices, where appropriate:

(a) introduction;

(b) general well data;

(c) a summary of drilling and related operations;

(d) a summary of weather, ice and sea conditions;

(e) geological and palaeontological information; and

(f) any wireline logs, petrophysical analyses and special studies.

PART X

OFFENCES

203. The contravention of any of the following provisions of these Regulations is an offence under Part III of the Act, namely, sections 65 to 67, 73 to 77, 79 to 89 and 91 to 155, subsection 156(1) and sections 157 to 167, 169 to 177, 179 to 182 and 184 to 202.