EXHIBIT/P-00035

Newfoundland Offshore Petroleum Installations Regulations

SOR/95-104

Registration February 21, 1995

CANADA-NEWFOUNDLAND ATLANTIC ACCORD IMPLEMENTATION ACT

Newfoundland Offshore Petroleum Installations Regulations

P.C. 1995-257 February 21, 1995

Whereas, pursuant to subsection 150(1) of the *Canada-Newfoundland Atlantic Accord Implementation Act*[*], a copy of the proposed *Regulations respecting petroleum installations used in areas offshore Newfoundland under the Canada-Newfoundland Atlantic Accord Implementation Act*, substantially in the form annexed hereto, was published in the *Canada Gazette* Part I on February 19, 1994 and a period of 30 days was thereafter afforded to interested persons to make representations to the Minister of Natural Resources with respect thereto;

And Whereas, pursuant to section 7 of the *Canada-Newfoundland Atlantic Accord Implementation Act*[*], the Minister of Natural Resources has consulted the Provincial Minister for the Province of Newfoundland with respect to the proposed Regulations and the latter has given his approval for the making of those Regulations;

Therefore, His Excellency the Governor General in Council, on the recommendation of the Minister of Natural Resources, pursuant to section 149[**] of the *Canada-Newfoundland Atlantic Accord Implementation Act*[*], is pleased hereby to make the annexed *Regulations respecting petroleum installations used in areas offshore Newfoundland under the Canada-Newfoundland Atlantic Accord Implementation Act*, effective on the day on which the *Newfoundland Offshore Petroleum Installations (Newfoundland) Regulations*, made pursuant to section 145 of the *Canada-Newfoundland Atlantic Accord Implementation Newfoundland Act*, come into force.

[*] S.C., 1987, c. 3
[**] S.C., 1992, c. 35, s. 63

REGULATIONS RESPECTING PETROLEUM INSTALLATIONS USED IN AREAS OFFSHORE NEWFOUNDLAND UNDER THE CANADA-NEWFOUNDLAND ATLANTIC ACCORD IMPLEMENTATION ACT

SHORT TITLE

1. These Regulations may be cited as the *Newfoundland Offshore Petroleum Installations Regulations*.

INTERPRETATION

2. (1) In these Regulations,

"accidental event" means an unplanned or unexpected event or circumstance or series of events or

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circumstances that may lead to loss of life or damage to the environment; (*événement accidentel*)

"accommodation area" means dependent personnel accommodation or an accommodation installation (*secteur d'habitation*)

"accommodation installation" means an installation that is used to accommodate persons at a production site or drill site and that functions independently of a production installation, drilling installation or diving installation, and includes any associated dependent diving system; (*installation d'habitation*)

"Act" means the *Canada-Newfoundland Atlantic Accord Implementation Act*; (*Loi*)

"certificate of fitness" means a certificate, in the form fixed by the Board, issued by a certifying authority in accordance with section 4 of the *Newfoundland Offshore Certificate of Fitness Regulations*; (*certificat de conformité*)

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

"Chief" means the Chief Safety Officer; (*délégué*)

"classification society" means an independent organization whose purpose is to supervise the construction, ongoing maintenance and any modifications of a platform in accordance with the society's rules for classing platforms and includes the American Bureau of Shipping, Lloyd's Register of Shipping, Det norske Veritas Classification A/S and Bureau Veritas; (*société de classification*)

"contingency plan" means a plan that addresses abnormal conditions or emergencies that can reasonably be anticipated; (*plan d'urgence*)

"control point" means a work area other than a control station from which systems and equipment critical to the safety of the installation can be monitored and controlled; (*poste de commande*)

"control station" means a continuously manned work area from which process and export equipment, wellhead manifold and christmas trees, main and emergency power, fire and gas detection, fire control, communications equipment, emergency shutdown systems, ballast control system, dynamic positioning systems and other systems and equipment critical to the safety of the installation are remotely controlled or monitored; (*salle de commande*)

"damaged condition" means, with respect to a floating platform, the condition of the platform after it has suffered damage to the extent described in the Code referred to in subsection 56(9); (*condition avariée*)

"dependent diving system" means a diving system that is associated with an installation other than a diving installation and that does not function independently of the installation; (*système de plongée non autonome*)

"dependent personnel accommodation" means personnel accommodation that is associated with an installation other than an accommodation installation and that does not function independently of the installation; (*logement du personnel connexe*)

"development plan" means a development plan relating to the development of a pool or field that is referred to in section 139 of the Act; (*plan de mise en valeur*)

"development plan approval" means the approval of a development plan pursuant to section 139 of the Act; (*approbation de plan de mise en valeur*)

"diving installation" means a diving system and any associated vessel that function independently of an accommodation installation, production installation or drilling installation; (*installation de plongée*)

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"Diving Program Authorization" means an authorization to conduct a diving program that is issued to an operator by the Board pursuant to paragraph 138(1)(*b*) of the Act; (*autorisation de programme de plongée*)

"diving system" means the plant or equipment used in or in connection with a diving operation, and includes the plant and equipment that are essential to a diver or to a pilot of a manned submersible; (*système de plongée*)

"drilling base" means the stable foundation on which a drilling rig is installed, and includes the ground surface, an artificial island, an ice platform, a platform fixed to the ground or seafloor and any other foundation specially constructed for drilling operations; (*base de forage*)

"drilling installation" means a drilling unit or a drilling rig and its associated drilling base, and includes any associated dependent diving system; (*installation de forage*)

"Drilling Program Authorization" means an authorization to conduct a drilling program that is issued to a person by the Board pursuant to paragraph 138(l)(*b*) of the Act; (*autorisation de 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, dependent personnel accommodation 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 that is used in a drilling program and is fitted with a drilling rig, and includes other facilities related to drilling and marine activities that are installed on a vessel or platform; (*unité de forage*)

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

"environmental load" means a load imposed by waves, currents, tides, wind, ice, sea ice, snow, an earthquake or any other naturally occurring phenomenon, or by any combination of those phenomena; (*charge environnementale*)

"floating platform" means a column-stabilized mobile platform or a surface mobile platform; (*plate-forme flottante*)

"flowline" means a pipeline that is used to transport fluids from a well to a production facility or vice versa, and includes intrafield export and all gathering lines; (*conduite d'écoulement*)

"gastight door" means a solid, close-fitting door designed to resist the passage of gas under normal operating conditions; (*porte étanche aux gaz*)

"hazardous area" means an area classified as hazardous in the Recommended Practice referred to in subsection (2); (*zone dangereuse*)

"installation" means a diving installation, a drilling installation, a production installation or an accommodation installation; (*installation*)

"intact condition" means, with respect to a floating platform, that the platform is not in a damaged condition; (*condition intacte*)

"machinery space" means a space on an installation where equipment incorporating rotating or reciprocating mechanical equipment in the form of an internal combustion engine, a gas turbine, an electric motor, a generator, a pump or a compressor is located; (*zone des machines*)

"major damage" means damage that results in uncontrolled pollution or loss of or serious threat to

life; (*dommage majeur*)

"manned installation" means an installation on which persons are normally present; (*installation habitée*)

"marine activities" means activities related to position keeping and collision avoidance of mobile platforms, including mooring, dynamic positioning and ballasting; (*activité maritime*)

"mobile platform" means a platform that is designed to operate in a floating or buoyant mode or that can be moved from place to place without major dismantling or modification, whether or not it has its own motive power; (*plate-forme mobile*)

"new installation" means an installation that is constructed after the coming into force of these Regulations; (*nouvelle installation*)

"non-combustible material" means material that does not burn or give off flammable vapours in sufficient quantity for self- ignition when heated to 750 °C; (*matériau incombustible*)

"operating condition", with respect to a mobile platform, means the condition of operating at the operating draft; (*condition d'exploitation*)

"operating draft", with respect to a mobile platform, means the vertical distance in metres from the moulded base line to the assigned waterline, where the platform is operating under combined environmental and operational loads that are within the limits for which the platform was designed to operate; (*tirant d'eau d'exploitation*)

"operations manual" means the manual referred to in section 63; (*manuel d'exploitation*)

"operator" means a person who has applied for or has been granted a production operations authorization, a Drilling Program Authorization or a Diving Program Authorization; (*exploitant*)

"platform" means a platform associated with an installation; (*plate-forme*)

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

"production installation" means a production facility and any associated platform, artificial island, subsea production system, offshore loading system, drilling equipment, facilities related to marine activities and dependent diving system; (*installation de production*)

"production operation" means an operation that is related to the production of oil or gas from a pool or field; (*travaux de production*)

"production operations authorization" means an authorization to conduct production operations issued to an operator by the Board pursuant to paragraph 138(1)(*b*) of the Act; (*autorisation d'exécuter des travaux de production*)

"production site" means a location where a production installation is or is proposed to be installed; (*emplacement de production*)

"subsea production system" means equipment and structures that are located on or below or buried in the seafloor for the production of oil or gas from, or for the injection of fluids into, a field under a production site, and includes production risers, flow lines and associated production control systems; (*système de production sous-marin*)

"survival condition", with respect to a mobile platform, means the condition of the platform when it is

subjected to the most severe environmental conditions determined pursuant to section 44; (*condition de survie*)

"survival draft", with respect to a mobile platform, means the vertical distance in metres from the moulded baseline to the assigned waterline, where the platform is subjected to the most severe environmental conditions determined pursuant to section 44; (*tirant d'eau de survie*)

"transit draft", with respect to a mobile platform, means the vertical distance in metres from the moulded base line to the assigned waterline, when the platform is moving from one geographical location to another; (*tirant d'eau de transit*)

"unmanned installation" means an installation on which persons are not normally present and in those instances when persons are present on the installation, their presence is for the purpose of performing operational duties, maintenance or inspections that will not necessitate an overnight stay; (*installation inhabitée*)

"watertight" means designed and constructed to withstand a static head of water without any leakage; (*étanche à l'eau*)

"working area" means any area of an installation that a person may occupy during the normal course of duties, and includes a control room, workshop, machinery space, storage area and paint locker. (*zone de travail*)

(2) Subject to subsection 9(2), for the purposes of sections 10, 11, 13, 14, 19 and 33, the classification of hazardous areas with respect to hazards caused by combustible gases on an installation shall be made in accordance with American Petroleum Institute RP 500, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities*.

(3) A reference to a standard or specification shall be considered to be a reference to that standard or specification as amended from time to time.

PART I

GENERAL REQUIREMENTS

General

3. For the purpose of ensuring the safety of an installation, no operator shall use the installation unless the equipment on the installation is arranged in accordance with these Regulations to

(*a*) provide for the safety of personnel;

(*b*) minimize damage to the environment; and

(*c*) enable easy access to the equipment.

Quality Assurance

4. (1) Every new installation shall be designed, constructed, installed and commissioned in accordance with a quality assurance program that complies with subsection (2) and that is selected in accordance with Canadian Standards Association CAN3-Z299.0-86, *Guide for Selecting and Implementing the CSA Z299-85 Quality Program Standards*.

(2) A quality assurance program shall be developed in accordance with

(*a*) *Canadian Standards Association* CAN3-Z299.l-85, *Quality Assurance Program — Category 1*;

(*b*) *Canadian Standards Association* CAN3-Z299.2-85, *Quality Control Program — Category 2*;

(*c*) *Canadian Standards Association* CAN3-Z299.3-85, *Quality Verification Program — Category 3*; and

(*d*) *Canadian Standards Association* CAN3-Z299.4-85, *Inspection Program — Category 4*.

Helicopter Deck

5. (1) Every helicopter deck or facility that forms part of an installation shall

(*a*) conform to Transport Canada TP 4414, *Guidelines Respecting Helicopter Facilities on Ships*;

and

(*b*) be equipped so that any fuel stored on or adjacent to the helicopter deck or to the accommodation areas

(i) can be jettisoned by action taken at another location on the installation, or

(ii) is protected against damage or impact.

(2) Every helicopter deck that forms part of an installation shall be in a location that is readily accessible to and from the dependent personnel accommodation of the installation.

Facilities for Inspection and Maintenance

6. An installation shall be designed and equipped in such a manner as to allow for the monitoring, maintenance and periodic inspection of the installation, including

(*a*) clear marking and identification of the areas to be inspected;

(*b*) provision for safe access to and adequate inspection space for the areas to be inspected;

(*c*) space for the storage and operation of diving equipment;

(*d*) means to facilitate the work of divers, where inspection by divers is required;

(*e*) means to assist maintenance personnel, including those doing underwater maintenance, to perform their work safely and effectively; and

(*f*) in the case of a mobile platform that is not intended to be periodically drydocked, means to facilitate on-location inspection of the hull.

Secondary Structures and Fittings

7. All decks, deckhouses, skids, modules and other structures located or installed on an installation shall be capable of withstanding all the loads and forces to which they will be subjected, as determined in accordance with section 44.

Arrangements of Materials and Equipment

8. (1) In this section

"flame-type equipment" means any electric or fired heating equipment that uses an open flame, electric arc or element, and includes a space heater, a torch, a heated process vessel, a boiler, an electric arc or an open flame welder, or an open element electric heater or appliance; (*équipement de type à flamme*)

"process vessel" means a heater, dehydrator, separator, treater or vessel used in the processing or treatment of produced gas or oil. (*récipient de fabrication*)

(2) No person shall create or cause to be created any unprotected flame or source of ignition within 50 m of a well, an oil storage tank or other source of ignitable vapour.

(3) No flame-type equipment shall be placed or operated within 25 m of a well, an oil storage tank or other source of ignitable vapour, except

(*a*) where the well is

(i) a water supply well, or

(ii) a water injection well equipped with a suitable packer and with the surface casing annulus vented outside any building; or

(*b*) where emergency works requires the use of flame-type equipment and the wellhead valves and blow-out preventer, if any, are closed.

(4) No flame-type equipment shall be placed or operated within 25 m of a process vessel, unless the flame-type equipment is fitted with an adequate flame arrester.

(5) No flame-type equipment shall be located in the same building as a process vessel or other source of ignitable vapour, unless

(*a*) the air intakes and flues of all burners are located outside the building;

(*b*) relief valves, safety heads and other sources of ignitable vapours are vented outside the building and discharged above roof level; and

(*c*) the building is adequately cross-ventilated.

(6) All process vessels and equipment from which ignitable vapour may issue shall be vented to the atmosphere, and all vent lines from every storage tank that is vented to flare pits or flare stacks shall

be provided with flame arresters or other equivalent safety devices.
(7) An exhaust pipe from an internal combustion engine located within 25 m of a well, a process vessel, an oil storage tank or other source of ignitable vapour shall be constructed so that
(*a*) any emergence of flame along its length or at its end is prevented; and
(*b*) the end is at least 6 m from the vertical centre line of the well projected upward and shall be directed away from the well.
(8) All equipment at or near a well, a process vessel, an oil storage tank or other source of ignitable vapour shall be constructed in accordance with Part I of the *Canadian Electrical Code Part I* and the *Oil and Gas Occupational Health and Safety Regulations*.

Access to Hazardous Areas

9. (1) Subject to subsection (2), there shall not be direct access or any opening in an installation between
(*a*) a non-hazardous area and a hazardous area; or
(*b*) a Class I, Division 2, hazardous area and a Class I, Division 1, hazardous area.
(2) Subject to subsections (3) to (5), an enclosed area that has direct access to, and that is classified as less hazardous than, a Class I, Division 1, hazardous area or a Class I, Division 2, hazardous area shall be considered to have the same classification as the area to which it has direct access.
(3) An enclosed area that has direct access to a Class I, Division 1, area shall be considered to be a Class I, Division 2, hazardous area if
(*a*) the access is fitted with a self-closing gastight door that opens into the enclosed area; and
(*b*) when the door is open, the air flows from the enclosed area into the Class I, Division 1, hazardous area.
(4) An enclosed area shall not be considered to be a hazardous area because of its direct access to a Class I, Division 2, hazardous area if
(*a*) the access is fitted with a self-closing gastight door that opens into the enclosed area; and
(*b*) when the door is open, the air flows from the enclosed area into the Class I, Division 2, hazardous area.
(5) An enclosed area shall not be considered to be a hazardous area because of its direct access to a Class I, Division 1, hazardous area if
(*a*) the access is fitted with self-closing gastight doors forming an air-lock; and
(*b*) the enclosed area is maintained at a pressure that is higher than the pressure maintained in the Class I, Division 1, hazardous area.
(6) Piping systems on an installation shall be designed to preclude direct communications between hazardous areas of different classifications and between hazardous and non-hazardous areas.

Ventilation of Hazardous Areas

10. (1) Every enclosed hazardous area on an installation shall be ventilated.
(2) The ventilation systems fitted on an installation for the purpose of subsection (1) shall be capable of replacing the air in the hazardous area at the rate of once every five minutes.
(3) Where a mechanical ventilation system is used for the purpose of subsection (1), the air in the enclosed hazardous area shall be maintained at a pressure that is lower than the pressure of each adjacent hazardous area that is classified as less hazardous.
(4) All air let into an enclosed hazardous area shall be taken from a non-hazardous area, and where the inlet duct passes through a hazardous area classified as more hazardous than the one to which the duct leads, the air in the inlet duct shall be maintained at a pressure that is higher than the pressure of the air in the hazardous area through which it passes.
(5) All air let out of an enclosed hazardous area shall be let into an outdoor area that would be classified as the same as or less hazardous than the enclosed hazardous area if it did not receive the air from the enclosed hazardous area.
(6) The ventilation system for every non-hazardous area shall be separate from the ventilation system for every hazardous area, and the ventilation fan inlets and outlets shall be arranged to prevent the air from a hazardous area from moving, as a result of the operation of any fan or the wind, into an area classified as less hazardous.
(7) Every ventilation outlet duct leading from a non-hazardous area where drilling or production

operations are conducted to a Class I, Division 2, hazardous area shall be equipped with self-closing shutters and a gas detector.
(8) A differential pressure gauge shall be installed to monitor any loss of ventilation pressure differential required by subsection (3) or (4) or maintained under section 9, and to activate audible and visual alarms at the appropriate control point after a suitable period of delay not exceeding 30 seconds if a loss occurs.
(9) The control station and all accommodation areas on an installation shall
(*a*) be maintained at a positive overpressure relative to atmospheric pressure; and
(*b*) have airlock arrangements on all external doors.
(10) The power for a mechanical ventilation system provided in accommodation areas, working areas, flammable liquid storage areas and other hazardous locations of an installation shall be capable of being shut off from the control station and from a position that is outside the area being served by the ventilation system and that will remain accessible during any fire that may occur within the area being ventilated.
(11) The main inlets and outlets of all ventilation systems shall be capable of being closed from a position that is outside the area being served by the ventilation system and that will remain accessible during any fire that may occur within the area being ventilated.

General Electrical Standards

11. (1) Subject to subsections (2) to (4), all electric motors, lighting fixtures, electric wiring and other electrical equipment on an installation shall be designed, installed and maintained in accordance with the American Petroleum Institute RP l4F, *Recommended Practice for Design and Installation of Electrical Systems for Offshore Production Platforms*.
(2) Electrical wiring on an installation shall be
(*a*) designed in accordance with International Electrotechnical Commission Publication 92-3, *Electrical Installations in Ships, Part 3: Cables (construction, testing and installations)* and tested for Category A in accordance with International Electrotechnical Commission Publication 332-3, *Tests on electrical cables under fire conditions, Part 3: Tests on bunched wires or cables*; and
(*b*) tested for impact at -35 °C and bending at -40 °C in accordance with Canadian Standards Association Standard C22.2 No. 0.3-M1985, *Test Methods for Electrical Wires and Cables*.
(3) Where a primary or secondary distribution system for power, heating or lighting, with no connection to earth, is used on an installation, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.
(4) The primary source of electrical power on every installation shall
(*a*) include at least two power plants;
(*b*) be capable of supporting all normal operations without recourse to the emergency source of electrical power required by section 12; and
(*c*) if one of the power plants is out of operation, be capable of supporting all operations except drilling and production operations.
(5) The primary circuits from the power plant serving an installation shall be equipped with at least two manual shut-off switches, each at a different location.

Emergency Electrical Power

12. (1) Every installation shall have an emergency source of electrical power that is independent of the primary source of electrical power and that is capable of supplying electrical power sufficient to operate, for at least twenty-four hours, the following equipment:
(*a*) all lights referred to in subsection (2);
(*b*) all gas detection and alarm systems;
(*c*) all fire detection and alarm systems;
(*d*) all firefighting systems except any fire pump that is driven by a liquid fuelled combustion engine;
(*e*) the general alarm system and all internal communication systems;
(*f*) the emergency shut-down system referred to in section 18;
(*g*) all lifesaving systems;

(*h*) all navigation lights, sound signal systems and illuminated markings, that are required by section 21;
(*i*) all radio communication equipment necessary to comply with the contingency plans referred to in section 43;
(*j*) on a mobile platform, the main ballast control system, one ballast pump for each individual ballast system and one bilge pump for each individual bilge system;
(*k*) on a column-stabilized mobile platform, the secondary ballast control system;
(*l*) all equipment necessary to secure the production or drilling operations in progress at any one time in a safe manner, including a well disconnect system;
(*m*) if a pumping system is required under paragraph (*l*), one pump that is not driven by an internal combustion engine that has sufficient capacity to kill any well on the installation;
(*n*) any blow-out prevention system; and
(*o*) any manned diving equipment dependent on an electrical supply.

(2) Every installation shall be equipped with lights supplied by the emergency source of power described in subsection (1), in the following locations:
(*a*) every embarkation station on deck and over sides;
(*b*) every escape route and area containing escape route markings;
(*c*) all service corridors and corridors in accommodation areas, and all stairways, exits and personnel lift cars;
(*d*) all machinery spaces and main generating stations;
(*e*) the control station and all control points;
(*f*) all spaces from which the drilling and production operations are controlled and at which controls of machinery essential for the performance of those operations and devices for the emergency shut-down of the power plant are located;
(*g*) the stowage positions for firefighting equipment;
(*h*) each sprinkler pump and fire pump and each ballast and bilge pump, referred to in paragraph (1)(*j*), and the starting position for each pump;
(*i*) every helicopter landing deck and every obstacle marker on that deck; and
(*j*) the radio room.

(3) Where the emergency source of electrical power required by subsection (1) is a mechanically driven generator, the installation shall be provided with
(*a*) a transitional source of electrical power, unless the generator will automatically start and supply the power required by subsection (1) in less than 45 seconds from the time the primary source of electrical power fails; and
(*b*) a self-contained battery system designed to supply sufficient power, automatically on failure or shutdown of both the primary and the emergency sources of electrical power, to operate, for a period of at least one hour the equipment described in subparagraphs (i) and (ii) and, for a period of at least four days, the equipment described in subparagraph (iii):
(i) the lights located in every emergency exit route, at every escape route, in every machinery space, the control station and every emergency assembly room and at every launching station of the lifesaving system,
(ii) the internal communication system and the general alarm system, and
(iii) the navigation lights, sound signal systems and illuminated markings referred to in section 21.

(4) The battery system referred to in paragraph (3)(*b*) shall be capable of returning to the trickle charge state on restoration of the primary or emergency source of electrical power.

(5) The emergency source of electrical power required by subsection (1) shall, for a floating platform, be designed to function at full rated power when the installation is upright and when it is at any inclination up to a maximum angle of
(*a*) 22 l/2 degrees about the longitudinal axis and 10 degrees about the transverse axis, in the case of a surface mobile platform;
(*b*) 25 degrees in any direction, in the case of a column- stabilized mobile platform; and
(*c*) 15 degrees in any direction, in the case of a self-elevating platform.

(6) The location of the emergency source of electrical power and associated fuel storage, the transitional source of power, if any, and the emergency switchboard on an installation shall be

(*a*) readily accessible from an open deck space;
(*b*) segregated by class A-60 divisions, as defined in subsection 23(1), from any space containing the main source of electrical power or the internal combustion engines;
(*c*) outside any hazardous area; and
(*d*) for a floating platform, located above the waterline that would exist if the platform were in a damaged condition and in a space outside any part of the platform if it were in that damaged condition.

(7) The emergency source of electrical power required by subsection (1) shall be designed to supply electrical power automatically, on failure of the primary source of electrical power, to a switchboard that is designed to direct the power to the equipment listed in that subsection.

Mechanical Equipment

13. (1) Every internal combustion engine on an installation shall be installed, maintained and operated in accordance with American Petroleum Institute RP 7C-llF, *Recommended Practice for Installation, Maintenance and Operation of Internal-Combustion Engines*.

(2) Combustion air for every internal combustion engine and fired vessel shall be taken from non-hazardous areas.

(3) Exhaust gas from every internal combustion engine and fired vessel shall be discharged to non-hazardous areas.

(4) The air induction system of every diesel engine operating in a hazardous area shall be equipped with

(*a*) a flame arrester in the induction system;
(*b*) a shut-off valve that is located between the engine air inlet filter and the induction system flame arrester and that is capable of being closed automatically by the engine overspeeding device and manually;
(*c*) a flame arrester in the exhaust system; and
(*d*) a spark arrester in the exhaust system, downstream of the flame arrester.

(5) Subject to subsection (13), the fuel supply system for every diesel engine shall be equipped with a manual shut-off device and, except for the emergency source of electrical power required by section 12, with a device that will automatically shut off the fuel supply if any of the following occur:

(*a*) overspeeding;
(*b*) high exhaust temperature;
(*c*) high cooling water temperature; or
(*d*) low lubricating oil pressure.

(6) The engine crankcase breather pipe on every diesel engine shall

(*a*) be equipped with a flame arrester; and
(*b*) in the case of an engine in an enclosed Class I, Division 2, hazardous area, lead to the atmosphere outside the installation.

(7) Basic operating instructions for every diesel engine shall give details of stop, start and emergency procedures and be permanently attached to the engine.

(8) The layout of every gas turbine, including the location of the control points, shall take into account the ability of the control point closest to the turbine to withstand pressure waves in the event of an explosion in the gas turbine exhaust duct or gas turbine hall and the effects of the failure of a gas turbine rotor where the fragments cannot be contained.

(9) Every gas turbine shall have, in addition to the speed governor, a separate overspeed device, arranged and adjusted so that the manufacturer's overspeed limitations for the turbine cannot be exceeded by more than 15 per cent.

(10) The air intakes and exhaust for every gas turbine shall be arranged to prevent, to the extent practicable, reingestion of combustion gases.

(11) Every multi-engine gas turbine shall have a separate air intake and exhaust, arranged so as to prevent induced circulation through a stopped turbine.

(12) All machinery, components and systems essential to the operation of a floating platform shall be designed to function at full rated power at any inclination, up to a maximum angle of

(*a*) in the case of a surface mobile platform,
(i) 15 degrees in any direction under static conditions,

(ii) 22½ degrees in any direction under rolling dynamic conditions, and
(iii) 7½ degrees by bow or stern under rolling dynamic conditions;
(*b*) for a column-stabilized mobile platform, 15 degrees in any direction; and
(*c*) for a self-elevating platform, 10 degrees in any direction.

(13) The automatic shut-off device referred to in subsection (5) shall shut off the fuel supply to engines associated with fire pump systems only where overspeeding occurs.

(14) Jacking mechanisms for self-elevating platforms shall, where possible, be arranged with redundancy so that a single failure of any component does not cause an uncontrolled descent of the platform.

Winterization

14. (1) Every installation shall be designed, constructed, equipped and insulated to ensure that, at the minimum air temperature that may occur at the drill site or production site during operations, based on an annual probability of exceedance of 10^{-2},

(*a*) in the case of a production installation, the production equipment and other associated equipment will operate in a safe and efficient manner;
(*b*) the emergency shutdown system referred to in section 18 will perform its intended functions;
(*c*) drilling safety systems and associated equipment will operate in accordance with the *Newfoundland Offshore Area Petroleum Drilling Regulations*;
(*d*) the fluids in the following systems and components will not freeze, namely,
(i) fresh water tanks and the associated piping,
(ii) vent pipes,
(iii) components of the drainage system,
(iv) the hydraulic system and its components, including operators and cylinders, and
(v) the firefighting system, including pump drives and fuel supply lines, fire pumps and associated piping, fire hydrants, fire hoses and nozzles;
(*e*) every pneumatic control system will remain fully operational at all times;
(*f*) the lifesaving appliances and associated devices will remain operational; and
(*g*) in the case of a mobile platform,
(i) the fluid in an operating ballast system, including the pumps, control systems and associated piping and valves, is protected against freezing,
(ii) the proper functioning of any thrusters is not impaired and the hydraulic fluid and lubricants for the thrusters have properties designed for such a temperature, and
(iii) the mooring winches and, where the platform is so equipped, the quick disconnect system will remain fully operational.

(2) Every installation shall be equipped with steam-generating equipment, or an equivalent means, that will keep the locations mentioned in subsection (3) free of ice and snow and lines thawed so as to permit drilling, production and maintenance operations to be conducted safely.

(3) Every installation that is equipped with steam-generating equipment, or an equivalent means, required by subsection (2) shall include outlets, hoses and hose clamps capable of being used in the following locations:

(*a*) work areas;
(*b*) walkways; and
(*c*) the helicopter deck and the lifeboat embarkation stations.

(4) Where temperatures below -20^{o}C may occur, based on an annual probability of exceedance of 10^{-2}, at the drill site or production site more than one day per year and where the installation is equipped with steam-generating equipment, or an equivalent means, required by subsection (2),

(*a*) that equipment shall meet the requirements set out in subsection (2) when operating at 75 per cent capacity; and
(*b*) the installation shall be equipped with a second set of steam-generating equipment or another means of providing equivalent protection against ice, snow and freezing.

Corrosion Protection

15. (1) All structural elements that are part of an installation and the failure of which as a result of corrosion would cause a safety hazard shall be protected or constructed with extra material so as to

prevent the degree of corrosion that may cause that structural element to fail and shall be protected against corrosion in accordance with section 4.15 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*.

(2) Corrosion protection systems for installations shall be designed, installed and maintained in accordance with

(*a*) section 15 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*, in the case of steel platforms; and

(*b*) sections 4.9.5, 5.1.1, 5.3, 5.4.2, 5.6, 5.10 and 11.19 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*, in the case of concrete platforms.

(3) All corrosion protection systems on an installation shall be designed so that adjustment, repair or replacement can be done on site, except where

(*a*) dry dock surveys are possible and are scheduled at a frequency of five years or less; or

(*b*) the corrosion protection system is a cathodic protection system that has a design life exceeding that of the installation.

Cranes

16. Every crane on an installation shall

(*a*) be designed and constructed in accordance with American Petroleum Institute Spec 2C, *Specification for Offshore Cranes*; and

(*b*) be operated and maintained in accordance with American Petroleum Institute RP 2D, *Recommended Practice for Operation and Maintenance of Offshore Cranes*.

Gas Release System

17. (1) In this section, “gas release system” means a system for releasing gas and combustible liquid from an installation, and includes a flare system, a pressure relief system, a depressurizing system and a cold vent system.

(2) Every gas release system shall be designed and located, taking into account the amount of combustibles to be released, the prevailing winds, the location of other equipment and facilities, including rigs, the dependent personnel accommodation, the air intake system, embarkation points, muster areas, the helicopter approaches and other factors affecting the safe, normal flaring or emergency release of the combustible liquid, gases or vapours, so that when the system is operating it will not damage the installation, other installations, the land or other platforms in the vicinity used for the exploration or exploitation of resources, or injure any person.

(3) Every gas release system shall be designed and installed in accordance with

(*a*) American Petroleum Institute RP 520, *Recommended Practice for the Design and Installation of Pressure-Relieving Systems in Refineries*;

(*b*) American Petroleum Institute RP 521, *Guide for Pressure-Relieving and Depressuring Systems*;

(*c*) American Petroleum Institute Standard 526, *Flanged Steel Safety-Relief Valves*;

(*d*) American Petroleum Institute Standard 527, *Seat Tightness of Pressure Relief Valves*; and

(*e*) American Petroleum Institute Standard 2000, *Venting Atmospheric and Low-Pressure Storage Tanks*.

(4) Every gas release system shall be designed and constructed to ensure that oxygen cannot enter the system during normal operation.

(5) Any flare boom and its associated equipment shall be designed

(*a*) to ensure a continuous flame using an automatic igniter system;

(*b*) to withstand the radiated heat at the maximum venting rate;

(*c*) to prevent flashback; and

(*d*) to withstand all loads to which they may be subjected.

(6) Every gas release system shall be designed to limit to the acceptable levels permitted by the *Oil and Gas Occupational Safety and Health Regulations* the noise that may occur as the gas expands.

(7) With the exception of water, any liquid that cannot be safely and reliably burned at the flare tip of a gas release system shall be removed from the gas before it enters the flare.

(8) Any vent that is used to release gas to the atmosphere without combustion shall be located and designed to minimize the risk of accidental ignition of the gas.

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(9) Every gas release system shall be designed and installed so that, taking into account the prevailing wind conditions, the maximum radiation on areas where personnel may be located, from the automatically ignited flame of a flare or vent, will be

(*a*) 6.3 kW/m^2, where the period of exposure will not be greater than one minute;

(*b*) 4.72 kW/m^2, where the period of exposure will be greater than one minute but not greater than one hour; and

(*c*) l.9 kW/m^2, where the period of exposure will be greater than one hour.

Emergency Shutdown System

18. (1) Every installation shall have an emergency shutdown system that is capable of shutting down and isolating all potential sources of ignition and sources of flammable liquids or gases.

(2) An emergency shutdown system shall be designed and installed so that when activated it causes

(*a*) an audible and visual signal that indicates the cause of its activation and the identity of the equipment that has been shut down and isolated to be given in the appropriate control point; and

(*b*) an audible alarm to be sounded through the general alarm system required by section 34 unless the alarm is overridden by the control point operator.

(3) In the case of a production installation, an emergency shutdown system shall be designed to ensure

(*a*) that there are at least two levels of shutdown; and

(*b*) subject to subsection (13), that the following will occur within the time and in the sequence set out in the operations manual, namely,

(i) the shutdown of all production facilities and associated test facilities,

(ii) the closure of all surface inlet manifold safety valves and production riser safety valves,

(iii) the closure of all Christmas tree safety valves and all downhole safety valves, and

(iv) the shutdown of all utilities except the equipment listed in subsection 12(1).

(4) In the case of a production installation, manual operation of an emergency shutdown system shall be in accordance with American Petroleum Institute RP 14C, *Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms*.

(5) In the case of a drilling installation, an emergency shutdown system shall be designed to ensure

(*a*) the shutdown within the time and in the sequence set out in the operations manual of all utilities, except the equipment listed in subsection 12(1); and

(*b*) that shutdown is possible from at least two strategic locations.

(6) The emergency shutdown system shall be designed to permit the selective shutdown of the ventilation systems required by section 10, except the fans necessary for supplying combustion air to prime movers for the production of electrical power.

(7) At least one of the controls of the emergency shutdown system shall be located outside hazardous areas.

(8) After an emergency shutdown, the emergency shutdown system shall stay in a locked-out condition until it is manually reset.

(9) The emergency shutdown system shall be connected to a source of power in such a way that, in the event of a failure of the primary source of power, there is automatic changeover to an emergency source of power and audible and visual alarms indicating that failure are given at the appropriate control point.

(10) Where a hydraulic or pneumatic accumulator is used to operate any part of the emergency system, the accumulator shall

(*a*) be located as close as is practicable to the part that it is designed to operate, except where that part is part of a subsea production system; and

(*b*) have capacity for at least three operations.

(11) In the event of a failure of the accumulator referred to in subsection (10), the shutdown valves shall revert to a fail- safe mode.

(12) All cables and pneumatic and hydraulic power lines that are part of the emergency shutdown system shall

(*a*) in the case of cables and power lines that are exposed to the risk of mechanical or fire damage, be protected

(i) by metal channels or casings, or
(ii) by being enclosed in a steel conduit or an equivalent covering; and
(*b*) as far as practicable, be segregated or routed away from the process and utility control systems so that any damage to those systems does not affect the shutdown system.

(13) In the case of a production installation, on activation of the emergency shutdown system, the surface-controlled subsurface safety valve shall close in not more than two minutes after the Christmas tree safety valve has closed, except where a longer delay is justified by the mechanical or production characteristics of the well.

Escape Routes

19. On every manned installation,
(*a*) every work area shall have at least two well-marked separate escape routes that are situated as far apart as is practicable;
(*b*) all escape routes shall lead to the open deck and from there to an evacuation station;
(*c*) in addition to the escape routes required by paragraph (*a*), clear passage shall be provided, where practicable, to the helicopter deck and sea level and other embarkation locations;
(*d*) all corridors that are more than 5 m long, all accommodation areas and, where practicable, all work areas shall have at least two exits, located as far apart as is practicable, that lead to escape routes;
(*e*) every escape route and embarkation station shall be free of all obstructions, and each exit door along the route shall be a sliding door or designed to open outwards;
(*f*) every escape route leading to an upper level shall, where practicable, be provided in the form of ramps or stairways;
(*g*) every escape route leading to a lower level shall, where practicable, be provided in the form of ramps, stairways or chutes of sufficient width to accommodate stretcher bearers with stretchers;
(*h*) suitable means shall be provided, where practicable, for persons to descend from the installation to the water;
(*i*) materials used for escape routes shall have a level of fire durability equivalent to steel;
(*j*) the survival craft evacuation stations located adjacent to the accommodation areas and the associated escape routes from the accommodation areas shall provide fire protection for a period of at least two hours; and
(*k*) all escape routes and associated stairwells shall be appropriately sheltered from the effects of fire and explosion.

Protection Against Impact

20. (1) Subject to subsection (4), every platform shall be designed to withstand accidental impacts with a vessel.

(2) Where practicable, every platform shall have a fender system, buoyage system or similar arrangement that will permit the transfer of goods to and from the production installation and a vessel without endangering that production installation or vessel or any person or goods.

(3) Subject to subsection (4), every platform, including any fender system, shall be capable of absorbing the impact energy of not less than 4 MJ from a vessel without endangering any person or the environment.

(4) Subsections (1) and (3) do not apply to an unmanned platform if any impact described by those subsections will not cause major damage.

(5) Every platform shall be designed so that the impact energy referred to in subsection (3)
(*a*) can be totally absorbed in the permanent deformation of the structural element impacted and by the elastic deflection of the platform; and
(*b*) will not be absorbed in the permanent deformation of the vessel.

(6) Where a fender system is used to comply with subsection (2), its size and arrangement shall be such that a vessel cannot be trapped under it at low tide.

Navigational Equipment

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21. Every installation shall be equipped with the navigation lights and sound signal systems that are required by

(*a*) in the case of a mobile platform, the *Collision Regulations*, as if the installation were a Canadian vessel; or

(*b*) in the case of a fixed platform, sections 8, 9 and 10 of the *Navigable Waters Works Regulations*, as if the installation were in waters to which those Regulations apply.

Lifesaving Equipment for Installations

22. (1) Every installation shall be provided with

(*a*) subject to subsection (2), in the case of a manned installation, two or more totally enclosed survival craft that have a combined carrying capacity of at least 200 per cent of the total number of persons on board the installation at any one time, and in the case of a unmanned installation, one or more totally enclosed survival craft that have a combined carrying capacity of at least 100 per cent of the total number of persons on board the installation at any one time;

(*b*) one or more inflatable liferafts, that have a combined capacity for accommodating at least 100 per cent of the total number of persons on board the installation at any one time, and that

(i) meet the requirements for inflatable liferafts set out in Schedule XI to the *Life Saving Equipment Regulations*, as if the liferafts were in waters to which those Regulations apply,

(ii) have float free capability,

(iii) if embarkation is more than 4.5 m from the waterline at the survival draft, are equipped with a launching device, and

(iv) are equipped with Class A equipment as described in Schedule II to the *Life Saving Equipment Regulations*;

(*c*) in the case of a manned installation, immersion suits for 200 per cent of the total number of persons on board the installation at any one time, that conform to National Standard of Canada CAN/CGSB-65.16-M89, *Marine Abandonment Immersion Suit Systems*, and that are stowed such that one suit is readily available adjacent to each bed and the remaining suits are equally distributed among evacuation stations;

(*d*) in the case of an unmanned installation, immersion suits for 100 per cent of the total number of persons on board the installation at any one time, that conform to the National Standard of Canada CAN/CGSB-65.16-M89, *Marine Abandonment Immersion Suit Systems*, and that are equally distributed among evacuation stations;

(*e*) a lifejacket for each of the persons on board the installation at any one time; and

(*f*) in the case of a manned installation,

(i) a motor-propelled rescue boat that

(A) meets the requirements for rescue boats set out in Regulation 47 of Chapter III of International Maritime Organization *International Conference on Safety of Life at Sea*,

(B) is located under a device capable of launching and retrieving the boat when the boat is fully loaded with equipment and complement, and

(C) is self-righting,

(ii) lifebuoys that are distributed on the decks of the installation, and that are stowed in a bracket or cleats, in at least the following numbers, namely,

(A) 8 lifebuoys for an installation that is 100 m or less in length,

(B) 10 lifebuoys for an installation that is more than 100 m but less than 150 m in length,

(C) 12 lifebuoys for an installation that is 150 m or more but less than 200 m in length, and

(D) 14 lifebuoys for an installation that is 200 m or more in length,

(iii) a rescue basket capable of accommodating at least six persons,

(iv) 12 Type A distress signals, as defined in the *Life Saving Equipment Regulations*,

(v) a Class I emergency position indicator radio beacon, as defined in the *EPIRB Regulations*, in each control station,

(vi) at least two radar transponders stowed in two widely separated locations, except in the case of surface mobile platforms,

(vii) in the case of surface mobile platforms, at least one radar transponder, and

(viii) two buoyant personnel transfer baskets.

(2) Each of the totally enclosed survival craft provided on an installation shall

(*a*) meet the requirements for Class I lifeboats as set out in Schedule V to the *Life Saving Equipment Regulations*, as if the survival craft were in waters to which those Regulations apply;

(*b*) be equipped with

(i) a compression ignition engine with two independent starting methods and with sufficient power to propel the craft when fully loaded,

(ii) an engine block heater, a head bolt heater or any other means of ensuring prompt engine start in cold weather,

(iii) a two-way fixed radio capable of permitting communications with other survival, support and rescue craft,

(iv) a towing attachment,

(v) the equipment required by Schedule I to the *Life Saving Equipment Regulations*, as if the installation were a Class I ship to which those Regulations apply,

(vi) a launching device,

(vii) a radar reflector,

(viii) a Class II emergency position indicator radio beacon, as defined in the *EPIRB Regulations*, and

(ix) a hand-held radio;

(*c*) be self-righting;

(*d*) be fire-protected;

(*e*) be capable of a speed of not less than 6 knots;

(*f*) have a self-contained air supply sufficient for at least 10 minutes;

(*g*) be stored or equipped

(i) in the case of a column-stabilized mobile platform and a fixed platform, so as to launch in a bow out aspect, and

(ii) in the case of a self-elevating mobile platform, so as to clear each leg, column, footing, brace or mat and any other similar structure below the hull;

(*h*) be positioned so that half the survival craft are close to the accommodation areas and the other half are appropriately located on the other side of the installation, taking into consideration the shape of the installation and the type of associated facilities;

(*i*) be stowed in a secure and sheltered position that is protected from damage by fire or explosion; and

(*j*) be stowed in such a manner that two crew members can carry out preparations for embarkation and launching in less than 5 minutes.

(3) The launching devices for the totally enclosed survival craft, the rescue boat and the inflatable liferafts provided on an installation shall

(*a*) meet the requirements for launching devices set out in Schedule IX to the *Life Saving Equipment Regulations*, as if the launching devices were located in waters to which those Regulations apply;

(*b*) be sufficiently strong to permit each survival craft, rescue boat or liferaft to be safely launched or lowered into the water when loaded with its full complement of persons and equipment; and

(*c*) situated so as to permit each survival craft, rescue boat or liferaft to be launched clear of any obstruction resulting from damage of the extent described in the Code referred to in subsection 56(9).

(4) Half of the lifebuoys provided on an installation shall be equipped with self-igniting lights, and not fewer than two of those lifebuoys shall be equipped with self-activating smoke signals.

(5) Two lifebuoys provided on an installation not equipped with lights and smoke signals shall be fitted with a buoyant lifeline, the length of which shall be at least one-and-a-half times the distance from the stowage deck to the waterline at the transit draft, or 30 m, whichever is greater.

(6) There shall be posted on every installation, including in the control station and in each accommodation area and work area, copies of a plan showing the position of all the lifesaving appliances.

Passive Fire and Blast Protection

23. (1) In this section,

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"class A-0 division" means a division formed by a bulkhead or deck that is constructed
(*a*) of steel or an equivalent material and suitably stiffened, and
(*b*) to prevent the passage of smoke and flame after 60 minutes of exposure to a standard fire test; (*cloisonnement de classe A-0*)

"class A-60 division" means a division formed by a bulkhead or deck that is
(*a*) constructed of steel or an equivalent material and suitably stiffened,
(*b*) constructed to prevent the passage of smoke and flame after 60 minutes of exposure to a standard fire test, and
(*c*) insulated with non-combustible materials so that, if either side is exposed to a standard fire test, after 60 minutes the average temperature on the unexposed face will not increase by more than 139 °C above the initial temperature and the temperature at any point on the unexposed face, including any joint, will not increase by more than 180 °C above the initial temperature; (*cloisonnement de classe A-60*)

"class B-15 division" means a division formed by a bulkhead, ceiling or lining that is
(*a*) constructed and erected entirely from non-combustible materials,
(*b*) constructed to prevent the passage of flame after exposure to a standard fire test for 30 minutes, and
(*c*) insulated so that if either face is exposed to the first 30 minute period of a standard fire test, the average temperature on the unexposed face will not increase at any time during the first 15 minutes of the test by more than 139 °C above that initial temperature, and the temperature at any point on the unexposed face, including any joint, will not increase by more than 225 °C above the initial temperature after exposure for 15 minutes; (*cloisonnement de classe B-15*)

"class H-120 division" means a division formed by a bulkhead or deck that is
(*a*) constructed of steel or an equivalent material and suitably stiffened,
(*b*) constructed to prevent the passage of smoke and flame after exposure to a hydrocarbon fire test for 120 minutes, and
(*c*) insulated with non-combustible material so that, if either face is exposed to a hydrocarbon fire test, after 120 minutes the average temperature on the unexposed face will not increase by more than 139 °C above the initial temperature, and the temperature at any point on the unexposed face, including any joint, will not increase by more than 180 °C above the initial temperature; (*cloisonnement de classe H-120*)

"hydrocarbon fire test" means a test in which a specimen division, which division resembles as closely as possible the intended construction of the division, includes, where appropriate, at least one joint and has an exposed surface of not less than 4.65 m^2 and a height or a length of not less than 2.44 m, and is exposed in a test furnace to temperatures corresponding approximately to a time-temperature relationship defined by a smooth curve drawn through the following temperature points measured above the initial furnace temperature, namely,
(*a*) at the end of the first 3 minutes, 880 °C,
(*b*) at the end of the first 5 minutes, 945 °C,
(*c*) at the end of the first 10 minutes, 1032 °C,
(*d*) at the end of the first 15 minutes, 1071 °C,
(*e*) at the end of the first 30 minutes, 1098 °C,
(*f*) at the end of the first 60 minutes, 1100 °C, and
(*g*) at the end of the first 120 minutes, 1100 °C; (*essai de résistance au feu d'hydrocarbures*)

"low flame spread" in respect of a surface, means that the surface restricts the spread of flame; (*à faible indice de propagation des flammes*)

"standard fire test" means a test conducted in accordance with Regulation 3.2 of Chapter II-2 of International Maritime Organization *International Conference on Safety of Life at Sea*. (*essai standard de résistance au feu*)
(2) Subject to subsection (3), on an installation,

(*a*) the wellhead and process areas on a production installation shall be separated from other areas by class H-120 divisions;
(*b*) all control stations shall be separated from other areas by class A-60 divisions;
(*c*) the accommodation areas shall be separated from other areas by class A-60 divisions;
(*d*) every machinery space and every storeroom containing paint, oil, any gaseous substance or other flammable material shall be separated from galleys or accommodation areas by class A-60 divisions and from each other by class A-0 divisions;
(*e*) galley supply and exhaust ventilator trunking within the accommodation areas or any other enclosed spaces shall be made of steel covered with a fire-resistant insulation material of a type and thickness equivalent to that in a class A-60 division;
(*f*) every deck and its supporting structure within the accommodation areas that is not required to be a class A-60 division shall be constructed of material that by itself or due to insulation provided will not lose its structural stability and fire integrity when subjected to a 60 minute standard fire test;
(*g*) every corridor bulkhead that is not required to be a class A-60 division shall be a class B-15 division and extend from deck to deck or, when continuous class B-15 divisions that are ceilings are fitted, from the deck to the continuous ceiling;
(*h*) every door in every class B-15 division that is a bulkhead shall meet the standard for a class B-15 division, except that a door to a cabin or to a public space other than a stairway may have ventilation openings or a louvre in the lower half;
(*i*) no door of a division forming any part of a stairway enclosure shall be provided with ventilation openings or louvres;
(*j*) every opening in every bulkhead and deck in the accommodation areas shall have permanently attached to it a means of closing that will maintain the fire integrity of the bulkheads and decks;
(*k*) where a class A-0 division, class A-60 division, class B-15 division or class H-120 division is pierced for the passage of electric cables, pipes, trunks or structural elements or for other purposes, arrangements shall be made so that the fire resistance of the division is not impaired;
(*l*) air spaces enclosed behind ceilings, panelling or linings shall be divided by close-fitting draught stops that are spaced not more than 14 m apart and that are fitted transversely if the length of the space exceeds 14 m and lengthwise if the width exceeds 14 m;
(*m*) every internal stairwell, ladderwell and crew elevator trunk within the accommodation areas shall be constructed of steel or equivalent material;
(*n*) every stairwell in the accommodation areas shall be enclosed within a trunk constructed of class A-60 divisions and shall have self-closing doors, except that a stairwell connecting only two decks need only be fitted at one deck level with a division that has the same fire integrity and structural stability as the deck and self-closing doors;
(*o*) for compartments that contain or are affected by oil and oil vapour, the surface of insulating materials fitted to the inside of bulkheads and decks and forming the casings and crowns shall be impervious to oil and oil vapour;
(*p*) every door and shutter in a bulkhead opening to hatches in the galley and pantry shall be constructed so that the fire integrity of the bulkhead is maintained, and shall be capable of being readily closed from a position outside the galley or pantry;
(*q*) primary deck coverings shall be of a type that will not readily ignite;
(*r*) paints, veneers and other finishes used on surfaces on concealed or inaccessible spaces and on exposed surfaces, except furniture, furnishings and floor coverings, shall be such that the surfaces are of a low flame spread type;
(*s*) overboard scuppers, sanitary discharges or other outlets close to the water shall be of material unlikely to fail in the event of fire;
(*t*) every load-bearing steel structural element shall be fire protected; and
(*u*) blast-resistant panels and explosion venting systems shall be provided in locations that are susceptible to an explosion.

(3) Subsection (2) does not apply to an unmanned installation, if the passive fire and blast structural protection provided will prevent major damage in the case of a fire or explosion.
(4) Galleys on an installation shall be provided with fire blankets.

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(5) Notwithstanding subsections (2) to (4), every installation shall be arranged in such a way that a fire in one area on the installation will be prevented from spreading to other areas and the consequences of an explosion on the installation are minimized, taking into account the fire or explosion hazard of any particular area.

Fire Hydrant Systems

24. (1) Every manned installation shall be provided with a fire hydrant system in accordance with this section.

(2) The fire hydrant system shall be connected to a continuously pressurized wet pipe water main that

(*a*) is connected to at least two pump systems that are situated as far apart as possible; and

(*b*) when any one of the pump systems required by paragraph (*a*) is out of operation,

(i) is capable of delivering at least one jet simultaneously from each of any two fire hydrants through the hoses and nozzles, at a pressure at the hydrants of at least 350 kPa,

(ii) is capable of delivering water at a sufficient pressure and quantity so that the aggregate capacity of the pump systems that are still operating is not less than 120 m^3/hour when the pump systems are delivering water to the fire hydrants, and

(iii) is capable of maintaining a pressure of at least 700 kPa to any foam system protecting the helicopter deck.

(3) The number and position of the fire hydrants in the fire hydrant system shall be such that water from any two hydrants, one of which is fitted with only a single length of fire hose and the other of which is fitted with one or two lengths of fire hose, can reach every part of the installation where a fire may occur.

(4) Each fire hydrant in the fire hydrant system shall be provided with a hose that

(*a*) is of not more than 18 m in length;

(*b*) is equipped with a 19 mm dual purpose nozzle capable of spray or jet action and with the necessary couplings; and

(*c*) meets the requirements of National Fire Protection Association 1961, *Standard on Fire Hose*.

Water Deluge and Water Monitor Systems in Areas with Petroleum

25. (1) In this section,

"water deluge system" means a system capable of deluging a space with water from fixed heads; (*système déluge*)

"water monitor system" means a system capable of deluging a space with water from monitors. (*système de régulation d'eau*)

(2) Every manned production installation shall be equipped with a water deluge system or, in the case of an open space, a water monitor system, for each space in the installation that contains equipment that stores, conveys or processes petroleum not used as fuel on the installation.

(3) The systems required by subsection (2) shall be

(*a*) connected to a continuously pressurized water main that is connected to at least two pump systems; and

(*b*) capable of discharging water at the rate of at least 12.2 L/minute/m^2 over the largest area served by the system when any one of the pump systems is out of operation.

(4) Every water deluge system shall

(*a*) operate automatically in response to a signal from the fire detection system;

(*b*) be capable of being operated manually from the control station and from locations close to but outside of each space served by it; and

(*c*) when in operation, automatically activate an audible and visual signal at the fire and gas indicator panel in the control station.

(5) Every water monitor system shall

(*a*) be capable of being activated manually from the control station and from locations close to but outside of each space served by it;

(*b*) have sufficient movement in the horizontal and vertical planes to permit the monitor to

discharge water into any part of the space served by it;

(*c*) be capable of being locked in any position; and

(*d*) be capable of discharging water as a jet or spray.

(6) A water deluge system provided pursuant to subsection (2) shall meet the requirements of National Fire Protection Association 15, *Standard for Water Spray Fixed Systems for Fire Protection*.

General Requirements for Fire Pump Systems and Water Mains

26. (1) The fire hydrant system referred to in section 24 and a water deluge system referred to in section 25 may be connected to the same water main and main pump systems.

(2) Every water main referred to in section 24 or 25 shall

(*a*) be routed clear of hazardous areas as far as practicable;

(*b*) be arranged in relation to any thermal barriers and structural elements of the installation so as to obtain the maximum protection from damage due to heat;

(*c*) be equipped with valves that will permit a damaged part of the system to be isolated from the undamaged parts; and

(*d*) be used solely for the purpose of firefighting.

(3) Every sea suction and source of power for each of the pump systems referred to in section 24 or 25 shall

(*a*) be designed and arranged to start automatically in response to

(i) any drop in water pressure that indicates a demand on the system,

(ii) the receipt of a signal from the fire detection system, and

(iii) the receipt of a signal from any manual control point;

(*b*) be capable of being started manually from the control station and started and stopped manually from a location close to the pump system;

(*c*) be capable of functioning continuously without attendance for at least 24 hours; and

(*d*) be designed and arranged so that a fire, explosion or flooding in any one space of the installation will not put more than one pump system out of operation.

(4) When any of the pump systems referred to in section 24 or 25 is started, an audible alarm shall be given automatically at the pump and an audible and visual alarm shall be given automatically at the fire and gas indicator panel in the control station.

(5) Every pump system provided pursuant to section 24 or 25 shall be located in a part of the installation remote from spaces that contain equipment used for storing, conveying or processing petroleum that is not used as fuel on the installation.

Sprinkler System in Accommodation Areas

27. (1) The accommodation areas in every manned installation shall be equipped with a sprinkler system that is supplied with water from

(*a*) two dedicated pump systems connected to the water main referred to in section 24 or 25 by way of a lockable screwdown non-return valve that will prevent backflow from the sprinkler system to the water main; or

(*b*) one dedicated sprinkler pump connected to

(i) the water main referred to in section 24 or 25 by way of a lockable screwdown non-return valve that will prevent backflow from the sprinkler system to the water main, and

(ii) a pressurized fresh water tank having a volume equal to at least twice the volume of water required pursuant to subsection (2) to be supplied for a period of one minute.

(2) The volume of water supplied by the pump systems or pump and fresh water tank described in subsection (1) shall be at a pressure sufficient to ensure, at the level of the highest sprinkler, continuous coverage of at least 280 m^2 at the rate of at least 6 L/minute/m^2.

(3) The sprinkler pump required by paragraph (1)(*b*) shall

(*a*) serve only the sprinkler system;

(*b*) be activated automatically by a pressure drop in the system before the water in the fresh water tank is depleted; and

(*c*) be powered from at least two sources.

(4) When the sprinkler system is activated, an audible and visual alarm that shows the location of the activated sprinklers shall be given automatically at the fire and gas indicator panel in the control

station.
(5) The sprinkler system shall be designed to prevent the passage of sea water into the fresh water tank.
(6) The sprinkler system shall be provided with at least one stop valve for every 200 sprinklers that can prevent the flow of water into those sprinklers without affecting the rest of the system.
(7) Each of the stop valves provided pursuant to subsection (6) shall be protected from accidental operation.
(8) A gauge indicating the pressure in the sprinkler system shall be fitted at each stop valve and at the control station.
(9) The sprinkler heads shall be placed in positions and spaced in a pattern that will ensure an average application rate of 6 L/minute/m^2 throughout each space in the accommodation areas.
(10) The pump system or pump and fresh water tank required by subsection (1) shall be situated outside the accommodation areas and as far as possible from the main machinery space.
(11) The sprinkler system shall be

(*a*) installed in accordance with National Fire Protection Association 13, *Standard for the Installation of Sprinkler Systems*; and

(*b*) tested and maintained in accordance with National Fire Protection Association 13A, *Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems*.

Fire Extinguishing Systems in Machinery and Flammable Liquid Storage Spaces

28. (1) On every installation, a fixed fire-extinguishing system utilizing carbon dioxide, pressure water spray or, where a fire will not involve any gases, liquefied gases with a boiling point below ambient temperature or cryogenic liquids, high expansion foam shall be installed in every space containing

(*a*) internal combustion machinery having an aggregate power of at least 750 kW;

(*b*) an oil- or gas-fired boiler or any other fired process vessel having a thermal rating of at least 75 kW;

(*c*) paint or other flammable liquids as defined by National Fire Protection Association 321, *Standard on Basic Classification of Flammable and Combustible Liquids*; or

(*d*) mud pits or equipment used for removing drill solids where oil-based mud is used.

(2) On every installation, a fixed fire-extinguishing system utilizing carbon dioxide or pressure water spray shall be provided in every compartment containing a pump for the transfer of oil.
(3) A fire-extinguishing system utilizing carbon dioxide referred to in subsection (1) or (2) shall meet the requirements of National Fire Protection Association 12, *Standard on Carbon Dioxide Extinguishing Systems*.
(4) A fire-extinguishing system utilizing pressure water spray referred to in subsection (1) or (2) shall meet the requirements of National Fire Protection Association 15, *Standard for Water Spray Fixed Systems for Fire Protection*.
(5) A fire-extinguishing system utilizing high expansion foam referred to in subsection (1) shall meet the requirements of National Fire Protection Association 16, *Standard on Deluge Foam-Water Sprinkler and Foam-Water Spray Systems*.
(6) When a fire-extinguishing system utilizing carbon dioxide is provided pursuant to subsection (1) or (2), means shall be provided to

(*a*) stop all ventilation fans serving the space protected by that system automatically before the system is activated; and

(*b*) close all dampers in the ventilation system serving the space protected by that system manually from a position that is outside that space and that will not be made inaccessible by a fire within that space.

(7) Every fire-extinguishing system referred to in subsection (1) or (2) shall be capable of being activated manually

(*a*) from a location close to but outside each space served by it; and

(*b*) at the location where the extinguishing medium is stored.

(8) At each access to every space served by a fire-extinguishing system referred to in subsection (1) or (2) there shall be a notice indicating that the space contains such a system and stating which fire extinguishing medium is used.

(9) Visual indication of the operational status of the fire-extinguishing system referred to in subsection (1) or (2) shall be provided at each access to every space served by that system and at the control station.
(10) Every installation provided with a fire-extinguishing system referred to in subsection (1) or (2) shall be provided with an automatic system that will give
(*a*) an audible warning, in every space served by that system to which personnel have access, before the fire extinguishing medium is released from the fire extinguishing system; and
(*b*) an audible and visual signal, outside the access to every space served by that system and at the fire and gas indicator panel in the control station, when the fire extinguishing system is in operation.
(11) Every installation provided with a fire-extinguishing system referred to in subsection (1) or (2) shall be provided with means to close all openings that may admit air to or allow gas to escape from a space served by that system.

Fire Extinguishers

29. (1) On every installation a portable fire extinguisher shall be provided
(*a*) within 10 m of any position accessible by personnel in every machinery, drilling and production and process space;
(*b*) within 15 m of any position accessible by personnel in every space other than a space described in paragraph (*a*); and
(*c*) near the entrance to each space referred to in paragraphs (*a*) and (*b*).
(2) Subject to subsection (3), the extinguishing medium employed by an extinguisher provided pursuant to subsection (1) shall be suitable for extinguishing fires in spaces in which it is intended to be used.
(3) Each extinguisher provided pursuant to subsection (1) for use in machinery spaces where oil is used as fuel shall be of a type discharging foam, carbon dioxide gas or dry powder.
(4) The capacity of each portable extinguisher provided pursuant to this section shall be at least
(*a*) 9 L, for an extinguisher that discharges foam;
(*b*) 4.5 kg, for an extinguisher that discharges dry powder;
(*c*) 6 kg, for an extinguisher that discharges carbon dioxide gas; and
(*d*) 9 L, for an extinguisher that discharges water.
(5) A spare charge shall be provided for each portable extinguisher provided pursuant to this section for which a duplicate extinguisher has not been provided.
(6) On an installation, every space containing internal combustion machinery that has an aggregate power of at least 750 kW shall be provided with one portable foam applicator unit and the following fire extinguishers:
(*a*) one foam type fire extinguisher of not less than 45 L capacity in every engine space;
(*b*) two portable foam extinguishers, where the aggregate power of the machinery is at least 750 kW but not more than 1500 kW;
(*c*) three portable foam extinguishers, where the aggregate power of the machinery is more than 1500 kW but not more than 2250 kW;
(*d*) four portable foam extinguishers, where the aggregate power of the machinery is more than 2250 kW but not more than 3000 kW;
(*e*) five portable foam extinguishers, where the aggregate power of the machinery is more than 3000 kW but not more than 3750 kW; and
(*f*) six portable foam extinguishers, where the aggregate power of the machinery is more than 3750 kW.
(7) On an installation, every space containing an oil- or gas-fired boiler or any other fired process vessel that has a thermal rating of at least 75 kW shall be provided with
(*a*) two portable foam fire extinguishers plus an additional portable foam fire extinguisher for each burner up to a total capacity of 45 L;
(*b*) one portable dry powder fire extinguisher; and
(*c*) one portable foam applicator unit.
(8) Every portable foam applicator unit provided pursuant to this section shall be provided with
(*a*) an air-foam nozzle of an inductor type capable of being connected to the water main

described in subsection 24(2) and of producing foam effective for extinguishing an oil fire at the rate of at least 1.5 m^3/minute; and

(*b*) at least two tanks, each containing at least 20 L of foam-making liquid.

(9) Every portable fire extinguisher on an installation shall be inspected, maintained and recharged in accordance with National Fire Protection Association 10, *Standard for Portable Fire Extinguishers*.

Firefighting Equipment

30. (1) Every manned installation shall be provided with at least ten sets of firefighter equipment and every unmanned installation shall be provided with at least two sets of firefighter equipment, each of which shall consist of

(*a*) protective clothing, including boots and gloves, that

(i) meets the requirements of National Fire Protection Association 1971, *Standard on Protective Clothing for Structural Fire Fighting*,

(ii) will protect the skin from being burned by heat radiating from a fire and by steam,

(iii) has a water-resistant outer surface,

(iv) in the case of boots, is made of rubber or other electrically non-conducting material, and

(v) in the case of gloves, meets the requirements of National Fire Protection Association 1973, *Standard on Gloves for Structural Fire Fighting*; and

(*b*) a firefighter's helmet with visor that meets the requirements of Canadian Standards Association CAN/CSA-Z94.1-92, *Industrial Protective Headwear*.

(2) In addition to any firefighting equipment required by the *Oil and Gas Occupational Safety and Health Regulations*, every manned installation shall be provided with at least four sets, and every unmanned installation shall be provided with at least two sets, of the following equipment:

(*a*) a self-contained breathing apparatus that

(i) is capable of functioning for at least 30 minutes,

(ii) meets the requirements of Canadian Standards Association CAN/CSA-Z94.4-93, *Selection, Use, and Care of Respirators*, and CAN3-Z 180.1-M85, *Compressed Breathing Air and Systems*, and

(iii) is equipped with two spare bottles;

(*b*) a portable electric safety lamp that

(i) will operate in the conditions anticipated for a Class I, Division 1, hazardous area,

(ii) is operated from a rechargeable battery capable of operating for at least 3 hours, and

(iii) can be easily attached to the clothing of a firefighter, at or above the waist level;

(*c*) an axe with an insulated handle and a carrying belt; and

(*d*) a fire-resistant life and signalling line and a safety belt and harness that meet the requirements of National Fire Protection Association 1983, *Standard on Fire Service Life Safety Rope, Harness and Hardware*.

(3) Each set of equipment required by subsections (1) and (2) shall be kept ready for use and stored so as to be readily accessible.

(4) One of each of the sets of equipment required by subsections (1) and (2) shall be located within easy access of the helicopter deck.

Automatic Fire Detection Systems

31. (1) Every manned installation shall be equipped with a fire detection system that is capable of detecting the presence of fire in every space where fire may occur, including

(*a*) every corridor, stairway and escape route in the accommodation areas;

(*b*) the control station;

(*c*) every work area; and

(*d*) every space containing equipment in which petroleum or any other flammable substance is stored, conveyed, processed or consumed.

(2) Every unmanned installation shall be equipped with a fire detection system that is capable of detecting the presence of fire in every space where fire may occur, including

(*a*) every work area; and

(*b*) every space containing equipment in which petroleum or any other flammable substance is stored, conveyed, processed or consumed.

(3) Every fire detection system required by subsections (1) and (2) shall be selected, designed, installed and maintained in accordance with National Fire Prevention Association 72E, *Standard on Automatic Fire Detectors*.
(4) The fire detection systems required by subsections (1) and (2) shall, on detection of fire, activate automatically
(*a*) an audible and visual signal on the fire and gas indicator panel in the control station of a manned installation; and
(*b*) an audible alarm that has a tone different from any other alarm in any part of the installation.

Gas Detection Systems

32. (1) Every installation shall be equipped with a gas detection system that is capable of detecting, in every part of the installation in which hydrogen sulphide or any type of hydrocarbon gas may accumulate, the presence of those gases.
(2) The gas detection system required by subsection (1) shall, on detection of gas, activate automatically
(*a*) an audible and visual signal on the fire and gas indicator panel in the control station of a manned installation; and
(*b*) an audible alarm that has a tone different from any other alarm in any part of the installation.
(3) Every installation shall be equipped with
(*a*) at least two portable gas detectors capable of
(i) measuring the concentration of oxygen in any space, and
(ii) detecting hydrogen sulphide and any type of hydrocarbon gas in any space; and
(*b*) a means of testing the portable gas detectors described in paragraph (*a*).
(4) A gas detector shall be provided
(*a*) at every ventilation inlet duct leading to a non-hazardous area on every installation; and
(*b*) in every enclosed hazardous area on every installation.
(5) Every gas detector provided in accordance with subsection (3) shall be appropriate for the area and installed and operated in accordance with
(*a*) Appendix C of American Petroleum Institute RP 14C, *Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms*; and
(*b*) section 9.2 of American Petroleum Institute RP 14F, *Recommended Practice for Design and Installation of Electrical Systems for Offshore Production Platforms*.

Alarm Panels and Signals

33. (1) Every manned installation shall be equipped with a fire or gas detection system that includes
(*a*) one or more fire and gas detector indicator panels located at the control station, that
(i) indicate the source of fire and gas by means of a visual signal,
(ii) are capable of being functionally tested, and
(iii) are fitted with equipment for resetting the fire and gas detection systems; and
(*b*) an audible fire and gas alarm that has a characteristic tone that distinguishes it from the alarms associated with machinery, safety and control system faults or any other alarm system and that is audible on all parts of the installation.
(2) A fire or gas detection system referred to in subsection (1) shall
(*a*) be capable of being manually activated from each of the following locations, namely,
(i) the space adjacent to each entrance to each machinery and process space,
(ii) each accommodation area,
(iii) the office of the manager of the installation,
(iv) every control point in each machinery and process space, and
(v) the control station;
(*b*) be designed so that, on activation of a detection device in one space, any signals received at the same time from a detection device in another space will register at the fire and gas indicator panel at that same time;
(*c*) be installed and maintained in accordance with National Fire Prevention Association 72, *Standard for the Installation, Maintenance, and Use of Protective Signaling Systems*; and

(*d*) be arranged so that there will be an automatic changeover to an emergency source of electrical power in accordance with subsection 12(9) in the event of a failure of the primary source of electrical power and so that failure of the primary source of electrical power will be indicated both visually and audibly as a separate fault alarm.

General Alarm System

34. (1) Every installation shall be equipped with a general alarm system that is capable of alerting personnel to any hazardous conditions other than fire or gas that might

(*a*) endanger the personnel;

(*b*) endanger the installation; or

(*c*) be harmful to the environment.

(2) Every general alarm system referred to in subsection (1) shall be

(*a*) operational and in operation at all times other than when the system is being inspected, maintained or repaired;

(*b*) where applicable, flagged as being subject to inspection, maintenance or repair; and

(*c*) designed in such a manner as to prevent tampering.

(3) Where a general alarm system for an installation is being inspected, maintained or repaired, the operator of the installation shall ensure that the functions that the system performs are performed manually.

Piping Systems

35. (1) The piping system and associated equipment of every installation shall be designed and installed in accordance with American Petroleum Institute RP 14E, *Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems*.

(2) Every pressure vessel or fired vessel on a production installation shall be designed and constructed in accordance with the following standards:

(*a*) American Petroleum Institute Spec 12J, *Specification for Oil and Gas Separators*;

(*b*) sections I, II, IV, V, VII, VIII and IX of American Society of Mechanical Engineers *ASME Boiler & Pressure Vessel Code*; and

(*c*) Canadian Standards Association B51-M1991, *Boiler, Pressure Vessel, and Pressure Piping Code*.

(3) Every compressor in hydrocarbon service at a production installation shall be designed in accordance with the following standards:

(*a*) Canadian Standards Association CAN/CSA-Z184-92, *Gas Pipeline Systems*;

(*b*) American Petroleum Institute STD 617, *Centrifugal Compressors for General Refinery Service*;

(*c*) American Petroleum Institute STD 618, *Reciprocating Compressors for General Refinery Services*; and

(*d*) American Petroleum Institute STD 619, *Rotary-Type Positive Displacement Compressors for General Refinery Services*.

(4) All materials and procedures used in a production installation used to produce and process sour gas shall conform to National Association of Corrosion Engineers (U.S.) MR-01-75, *Sulfide Stress Cracking Resistant Metallic Materials for Oil Field Equipment*.

(5) Where an operator handles, treats or processes oil, gas or water that contains hydrogen sulphide, the operator shall do so in accordance with good industry practice to minimize the discharge of hydrogen sulphide into the environment and to ensure that the operation is carried out in a safe and efficient manner.

Communication Systems

36. (1) No person shall operate a manned installation unless the installation is equipped with

(*a*) a radio or telephone communication system; and

(*b*) an emergency communication system.

(2) The communication systems referred to in subsection (1) shall be operational at all times.

(3) No person shall operate a manned installation unless the installation is equipped with a two-way

radio communication system that

(*a*) enables effective communication by radio to be maintained between the installation and helicopters, the shore base, support vessels, standby vessels, search and rescue aircraft, and other nearby installations; and

(*b*) enables effective communication with marine traffic in the vicinity.

(4) The operator of a manned installation shall ensure that the radio communication systems comply with the *Ship Station Radio Regulations* and the *Ship Station Technical Regulations*, as if the installation were a ship to which those Regulations apply.

(5) Each installation shall comply with the *VHF Radiotelephone Practices and Procedures Regulations*, as if the installation were a ship to which those Regulations apply.

(6) No person shall operate a manned installation unless the installation is equipped with

(*a*) an internal telephone system;

(*b*) a public address system with loudspeakers located so that a voice transmission can be heard throughout the installation; and

(*c*) a means of transmitting written data to the shore base of the installation.

(7) No person shall operate an installation that is usually unmanned unless the installation is equipped with

(*a*) an operational two-way radio communication system during any period when the installation is manned; and

(*b*) a system capable of detecting under ambient conditions any hazardous conditions that could endanger the safety of the installation or damage the environment and of alerting the control station about the hazardous conditions.

PART II

ANALYSIS AND DESIGN

General Design Considerations

37. (1) Every installation and every component of an installation shall be designed in accordance with good engineering practice, taking into account

(*a*) the nature of the activities on and around the installation;

(*b*) the type and magnitude of functional loads, environmental loads, and foreseeable accidental loads;

(*c*) operating and ambient temperatures;

(*d*) corrosion conditions that may be encountered during the construction, operation and maintenance of the installation;

(*e*) the avoidance of damage to any part of the installation that may lead to the progressive collapse of the whole installation; and

(*f*) soil conditions.

(2) The design of an installation shall be based on such analyses or model tests of the installation, including simulations to the extent practicable, as are necessary to permit the determination of the behaviour of the installation and of the soils that support the installation or anchoring systems, under all foreseeable transportation, installation and operating conditions.

Design of Installations

38. Every installation shall be designed in accordance with the

(*a*) section 4 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*;

(*b*) for the foundation, section 5 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*;

(*c*) for a steel platform, section 7 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*;

(*d*) for a concrete platform, sections 3 and 7 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*; and

(*e*) in respect of its transportation and installation, sections 5, 6 and 7 of Canadian Standards

Association Preliminary Standard S475-M1989, *Sea Operations*.

Design of Platforms

39. Every platform shall be designed in accordance with

(*a*) for composite ice-resisting walls, section 13 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*;

(*b*) for the foundation, section 5 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*;

(*c*) for a steel platform, sections 9, 10, 11, 12 and 16 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*;

(*d*) for a concrete platform, sections 8, 9, 10 and 12 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*; and

(*e*) for a gravity base, fill, fill-retention or piled platform, section 6, 7, 8 or 9 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*, as applicable.

Analyses

40. (1) Analyses undertaken in respect of an installation for the purposes of subsection 37(2) shall cover all relevant structural elements of the installation, shall be based on good engineering practice and shall include

(*a*) a structural analysis;

(*b*) a fatigue analysis;

(*c*) a structural element stability analysis;

(*d*) an overall installation stability analysis;

(*e*) for a mobile platform, an intact and damage stability analysis; and

(*f*) a hydrodynamic analysis.

(2) Analyses undertaken in respect of a platform for the purposes of subsection 37(2) shall be carried out in accordance with

(*a*) section 4.6.7 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*;

(*b*) for a steel platform, section 8 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*; and

(*c*) for a concrete platform, sections 8 and 9 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*.

(3) A fatigue analysis undertaken in respect of a platform for the purpose of subsection 37(2) shall be carried out in accordance with

(*a*) for a steel platform, section 14 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*; and

(*b*) for a concrete platform, section 8.5 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*.

(4) The foundation of major machinery and equipment on an installation shall be analysed to determine if the resulting deflection, stresses and vibration are within the limits of the structural design criteria for the equipment.

Innovations for Installations

41. The design of an installation shall not involve the use of any design method, material, joining technique, or construction technique that has not previously been used in comparable situations, unless

(*a*) there have been engineering studies or prototype or model tests that demonstrate the adequacy of the method, material or technique; and

(*b*) the operator implements a performance monitoring and inspection program that is designed to permit the determination of the correctness of the method, material or technique.

Removal and Abandonment of Fixed Production Installations

42. Where the removal of a fixed production installation is a condition of a development plan

approval, the operator shall incorporate in the design of the installation such measures as are necessary to facilitate its removal from the site without causing a significant effect on navigation or the marine environment.

Concept Safety Analysis for Production Installations

43. (1) Every operator shall, at the time the operator applies for a development plan approval in respect of a production installation, submit to the Chief a concept safety analysis of the installation in accordance with subsection (5), that considers all components and all activities associated with each phase in the life of the production installation, including the construction, installation, operation and removal phases.

(2) The concept safety analysis referred to in subsection (1) shall

(*a*) be planned and conducted in such a manner that the results form part of the basis for decisions that affect the level of safety for all activities associated with each phase in the life of the production installation; and

(*b*) take into consideration the quality assurance program selected in accordance with section 4.

(3) Target levels of safety for the risk to life and the risk of damage to the environment associated with all activities within each phase of the life of the production installation shall be defined and shall be submitted to the Chief at the time the operator applies for a development plan approval.

(4) The target levels of safety referred to in subsection (3) shall be based on assessments that are

(*a*) quantitative, where it can be demonstrated that input data are available in the quantity and of the quality necessary to demonstrate the reliability of the results; and

(*b*) qualitative, where quantitative assessment methods are inappropriate or not suitable.

(5) The concept safety analysis referred to in subsection (1) shall include

(*a*) for each potential accident, a determination of the probability or susceptibility of its occurrence and its potential consequences without taking into account the plans and measures described in paragraphs (*b*) to (*d*);

(*b*) for each potential accident, contingency plans designed to avoid the occurrence of, mitigate or withstand the accident;

(*c*) for each potential accident, personnel safety measures designed to

(i) protect, from risk to life, all personnel outside the immediate vicinity of the accident site,

(ii) provide for the safe and organized evacuation of all personnel from the production installation, where the accident could lead to an uncontrollable situation,

(iii) provide for a safe location for personnel until evacuation procedures can be implemented, where the accident could lead to an uncontrollable situation, and

(iv) ensure that the control station, communications facilities or alarm facilities directly involved in the response to the accident remain operational throughout the time that personnel are at risk;

(*d*) for each potential accident, appropriate measures designed to minimize the risk of damage to the environment;

(*e*) for each potential accident, an assessment of the determination referred to in paragraph (*a*) and of the implementation of the plans and measures described in paragraphs (*b*) to (*d*);

(*f*) a determination of the effects of any potential additional risks resulting from the implementation of the plans and measures described in paragraphs (*b*) to (*d*); and

(*g*) a definition of the situations and conditions and of the changes in operating procedures and practices that would necessitate an update of the concept safety analysis.

(6) The determinations and assessments required by paragraphs (5)(*a*) and (*e*), respectively, shall be

(*a*) quantitative, where it can be demonstrated that input data is available in the quantity and of the quality necessary to demonstrate reliability of the results; and

(*b*) qualitative, where quantitative assessment methods are inappropriate or not suitable.

(7) The plans and measures identified under paragraphs (5)(*b*) to (*d*) shall be designed to ensure that the target levels of safety as defined pursuant to subsection (3) are met.

(8) The operator shall maintain and update the concept safety analysis referred to in subsection (1) in accordance with the definition of situations, conditions and changes referred to in paragraph (5)(*g*) to reflect operational experience, changes in activity or advances in technology.

EXHIBIT/P-00035

Environmental Criteria and Loads

44. (1) For the purposes of undertaking the analyses referred to in section 40, the determination of environmental criteria and loads on an installation shall be made in accordance with sections 5 and 6.5 to 6.13 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*.

(2) For the purposes of undertaking the analyses referred to in section 40, permanent loads, operational loads and accidental loads shall be determined in accordance with sections 6.2, 6.3 and 6.4, respectively, of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*.

(3) For the purposes of undertaking the analyses referred to in section 40, for installations, load combinations shall be determined in accordance with section 6.14 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*.

Site Investigations

45. (1) Site investigations shall be carried out, for the purpose of undertaking the analyses referred to in section 40, in accordance with section 4 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*.

(2) Where permafrost is present at a production site, the geotechnical investigation for the purposes of undertaking the analyses referred to in section 40 shall include sampling of the permafrost.

(3) The analysis of all fill sources for an installation shall meet the requirements of section 7.3.2 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*, and shall include sampled boreholes and laboratory testing of the recovered samples.

Geotechnical Parameters

46. For the purposes of undertaking the analyses referred to in section 40, the geotechnical parameters used for stability, deformational and thermal analyses shall be selected in accordance with section 5.2.5 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*.

Soil Deformation

47. For the purposes of undertaking the analyses referred to in section 40, the analysis for determining the deformation of foundations shall be made in accordance with sections 5.2.4, 6.1.3, 7.1.3, 8.1.3 and 9.2.4 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*.

Erosion Offshore

48. (1) For the purposes of undertaking the analyses referred to in section 40, the analysis of the erosion offshore shall be made in accordance with sections 6.2.3, 7.2.2 and 9.3.5 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*.

(2) Where there is a potential for erosion around a platform to a degree that would affect the stability of the platform, the platform shall be

(*a*) provided with means of erosion protection that eliminate or prevent that degree of erosion; or

(*b*) designed assuming all materials that are not resistant to erosion, determined from physical or numerical modelling, are removed.

(3) The operator of a platform or drilling unit that is placed so close to an existing platform as to cause erosion that affects the stability of the existing platform shall take measures to prevent that erosion.

Materials for Installations

49. (1) Notwithstanding compliance with the standards referred to in this Part, all materials used in an installation shall be suitable for the service in which, and for the conditions under which, they are

used.
(2) No materials other than non-combustible materials shall be used in an installation except where a special property is required that cannot be obtained by using a non-combustible material.
(3) Subject to subsection (4), materials, such as organic foam insulation, that may give off toxic fumes or smoke when ignited shall not be used in an installation.
(4) Combustible foam insulation may be used for cold storage or refrigerated spaces on an installation if

(*a*) the foam is of a fire retardant type;

(*b*) the foam is totally enclosed in stainless steel or another corrosion-resistant material that has all joints sealed; and

(*c*) the insulation and its casing do not form any part of the accommodation deck or bulkhead.

(5) All structural concrete used in an installation shall be in accordance with sections 4, 5 and 6 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*.
(6) All structural steel used in an installation shall be in accordance with sections 5, 6 and 17 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*.

Air Gap and Freeboard

50. (1) Subject to subsection (2), the air gap for an installation, except for a surface platform, shall be determined in accordance with section 4.8 of Canadian Standards Association CAN/CSA-S471-92, *General Requirements, Design Criteria, the Environment, and Loads*.
(2) The air gap for a column-stabilized mobile platform may be calculated assuming the platform is at survival draft and at its lowest position relative to sea level, as determined from its motion characteristics.
(3) Every surface mobile platform shall have sufficient freeboard, taking into consideration the environmental criteria and loads at the drill or production site determined under section 44.
(4) Every fixed production platform shall have sufficient freeboard to prevent ice rubble or waves from flowing over the side of the platform unless it is designed to withstand the loads due to water and ice without major damage, under the most severe conditions as determined pursuant to section 44.

Load Measuring System

51. Each leg on every self-elevating mobile platform shall have a load measuring system that will permit

(*a*) registration of the load on the leg at any time during jacking operations; and

(*b*) measurement of the load on the leg periodically.

Gravity-Base, Fill, Fill-Retention and Self-elevating Platforms

52. Every gravity-base, fill, fill-retention and self-elevating platform shall be designed in accordance with sections 5, 6, 7 and 8, respectively, of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*, and section 5.2.2 of Canadian Standards Association Special Publication S472.1-1992, *Commentary to CSA Standard CAN/CSA-S472-92, Foundations*.

Pile Foundations

53. Pile foundations of every fixed platform and, where applicable, subsea production system shall be designed in accordance with section 9 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*, and section 5.2.2 of Canadian Standards Association Special Publication S472.1-1992, *Commentary to CSA Standard CAN/CSA-S472-92, Foundations*.

Structural Strength of Mobile Platforms

54. (1) Every floating platform that is intended to be used in areas in which sea ice is present shall be able to

(*a*) withstand, without major damage, the ice loads to which it may be subjected when it is operating in accordance with the operations manual;

(*b*) stay on location in the ice concentration and under the ice forces to which it may be subjected, as stated in the operations manual; and

(*c*) be moved from the production site or drill site in the ice concentration to which it may be subjected, as stated in the operations manual.

(2) In an analysis undertaken in accordance with subsection 37(2) for the purpose of determining the resistance to overturning and the resistance to sliding of a self-elevating mobile platform,

(*a*) a lattice type leg may be analysed using equivalent single- beam hydrodynamic coefficients as determined in accordance with Det norske Veritas Classification Notes, Note No. 31.5 — *Strength Analysis of Main Structures of Self-Elevating Units*, when determining

(i) the hydrodynamic loads to be used in calculating overturning forces and sliding forces, if a vertical load equal to 5 per cent of the horizontal load is applied at the centre of the leg, and

(ii) the hydrodynamic forces to be used in any detailed finite element analysis of the upper legs and hull;

(*b*) the overturning moments and sliding forces shall be assessed assuming no spudcan fixity and using the most critical combination and direction of environmental and functional loads;

(*c*) the reaction point for an independent leg platform shall be taken as the point located at a distance above the spudcan tip that is equal to the lesser of

(i) half the height of the spudcan, and

(ii) half the total penetration; and

(*d*) the reaction point for a mat-supported platform shall be determined considering the soil characteristics determined in the site investigation undertaken pursuant to section 45.

(3) Where any wave frequency or seismic ground motion predicted for the production site of a self-elevating mobile production platform is close to the frequency of oscillation of the platform, a dynamic response calculation shall be performed as part of the analyses required by section 37 and the dynamic loads determined thereby shall be included in the relevant stress and fatigue analyses.

(4) The connection between each spudcan and each leg of a self-elevating mobile platform shall be designed to withstand without failure the loads occurring at the full spudcan fixity condition.

(5) Each spudcan and each connection between each spudcan and each leg of a self-elevating mobile platform shall be designed for all possible penetrations or conditions ranging from tip penetration to full spudcan penetration as determined by the site investigation undertaken pursuant to section 45, and the shape of the spudcan.

(6) Every spudcan of a self-elevating mobile platform shall have sufficient strength to withstand storm-induced horizontal loads, vertical loads, and one half of the lower guide bending moment that is calculated assuming the leg is pinned.

(7) The secondary bending effects of the legs of a self-elevating mobile platform shall be taken into account in the performance of an analysis pursuant to section 37.

(8) The analysis required pursuant to section 37 to verify whether a self-elevating mobile platform is capable of withstanding the loads imposed during transportation shall be performed in accordance with Part 3, Chapter 2, Sections 3 C-100 and D-300 of Det norske Veritas *Rules for Classification of Mobile Offshore Units*.

(9) A self-elevating mobile platform with independent footing support shall be designed to withstand the loads that may be imposed during preload operations, including where there is

(*a*) loss of foundation support for one leg for a distance of at least 4 m; and

(*b*) offset support of 1.5 m from the centre of the spudcan tip.

(10) The legs, spudcans and mats of every self-elevating mobile platform shall be designed for any impact load that might occur on setdown, in accordance with Part 3, Chapter 2, Section 3 E-400 of Det norske Veritas *Rules for Classification of Mobile Offshore Units*, using the maximum environmental and functional loading conditions for setdown operations, as specified in the operations manual.

(11) The legs of every self-elevating mobile platform shall be preloaded to at least l.l times the reaction expected at the footing or mat at the extreme loading condition.

Motion Response Characteristics

55. The motion response characteristics of every floating platform shall be determined by analytical methods or by model tests for the six degrees of freedom for all relevant operational, transit and

survival drafts.

Stability of Mobile Platforms

56. (1) For the purpose of this section, “lightship”, in relation to a mobile platform, means a platform with all its permanently installed machinery, equipment and outfit, including permanent ballast, spare parts normally retained on board and liquids in machinery and piping at their normal working levels, but not including liquids in storage or in reserve supply tanks, items of consumable or variable loads, stores and crew and their effects.

(2) Subject to subsection (3), an inclining test shall be carried out to determine the lightship weight and the location of the centre of gravity on every mobile platform.

(3) Detailed weight calculations showing the differences of weight and centres of gravity may be used in lieu of the inclining test required by subsection (2), in respect of a surface or self-elevating mobile platform of a design that is identical with regard to hull form and arrangement to that of a platform for which an inclining test has been carried out, if the accuracy of the calculations is confirmed by a deadweight survey.

(4) Subject to subsection (6), during each five-year survey that is required and carried out by a classification society of a surface or self-elevating mobile platform, a deadweight survey shall be carried out and, where there is a significant discrepancy between the measurement obtained from that survey and the weight change as calculated from weight records,

(*a*) in the case of a surface platform, an inclining test shall be carried out; and

(*b*) in the case of a self-elevating platform, the allowable variable load in the elevated condition shall be adjusted in accordance with the deadweight survey and the stability in the floating mode shall be calculated.

(5) Subject to subsection (6), an inclining test shall be carried out during each five-year survey that is required and carried out by a classification society for every column-stabilized mobile platform, except that after the second inclining test, the subsequent tests need only be carried out during every alternate five-year survey if there was no significant discrepancy between the weight records and the results of the second test.

(6) An inclining test is not required pursuant to subsection (4) or (5) where the platform is equipped with instrumentation that is capable of accurately measuring or providing data that permit an accurate calculation of the centre of gravity.

(7) A comprehensive and up-to-date record shall be kept of every change to a mobile platform that involves a change in weight or position of weight.

(8) Where the weight of a mobile platform changes by more than 1 per cent of the lightship weight, a deadweight survey shall be carried out at the earliest opportunity and an up-to-date value of the lightship centre of gravity shall be recorded in the operations manual.

(9) Subject to subsections (10) to (13), the analysis of intact and damage stability of every mobile platform undertaken for the purpose of paragraph 40(1)(*e*) shall include a verification as to whether the platform complies with Chapter 3 of International Maritime Organization *Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989*.

(10) Every mobile platform shall be designed so that, in the intact condition, when subjected to the wind heeling moments described in the Code referred to in subsection (9), it has a static angle of heel of not more than 15 degrees in any direction.

(11) Every column-stabilized mobile platform shall be designed so that, in the intact condition, it has a metacentric height of at least 1 m when it is in the operating and transit draft and a metacentric height of at least 0.3 m in all other draft conditions.

(12) Every surface and self-elevating mobile platform shall be designed so that, in the intact condition, it has a metacentric height of at least 0.5 m.

(13) Every mobile platform shall be designed so that, in the damaged condition or where any compartment is flooded, the final angle of heel does not exceed 15 degrees in any direction and the area under the righting moment curve is at least equal to the area under the heeling moment curve.

Ballast and Bilge Systems

57. (1) Every mobile platform shall be equipped with ballast tanks the number, location and degree of subdivision of which, together with the associated equipment, are

(*a*) capable of ballasting and trimming the platform efficiently under all reasonably anticipated environmental conditions; and

(*b*) designed to be fail safe.

(2) Every floating platform shall have a ballast system so arranged that any ballast tank can be filled or emptied by any one of at least two ballast pumps or by controlled free flow.

(3) Each lower hull on a floating platform with two lower hulls shall be provided with at least two ballast pumps each with the capacity to fill or empty any ballast tank in that hull.

(4) The ballast system for a column-stabilized mobile platform shall be designed to prevent uncontrolled transfer of water between tanks or through sea-connected inlets or discharges in any one of the following situations:

(*a*) the failure of any valve or valve actuator for the system;

(*b*) the failure in the means of control or indication for the system; and

(*c*) the flooding of any space that contains equipment associated with the system.

(5) Ballast piping in a ballast system for a floating platform that leads from a pump to more than one tank shall be led from readily accessible manifolds.

(6) All power-operated sea inlets, discharge valves and ballast tank isolating valves on a floating platform shall be designed to close automatically on loss of control power and remain closed when power is re-established until specific action is taken to open them.

(7) Where crude oil is to be stored in a floating platform, the platform shall have enough ballast capacity, segregated from the crude storage, to be able to float at minimum operating draft with no crude oil on board.

(8) Every floating platform shall be provided with a main ballast control station equipped with

(*a*) an effective means of communication with other spaces that contain equipment relating to the operation of the ballast system;

(*b*) a ballast pump control and status system;

(*c*) a ballast valve control and status system;

(*d*) a tank level indicating system;

(*e*) a draft indicating system;

(*f*) emergency lighting;

(*g*) heel and trim indicators;

(*h*) bilge and flood alarms; and

(*i*) remote control indicators for watertight closing appliances.

(9) Every column-stabilized mobile platform shall be equipped with a secondary ballast control station equipped with

(*a*) an effective means of communication with other spaces that contain equipment relating to the operation of the ballast system;

(*b*) a ballast pump control and status system;

(*c*) a ballast valve control and status system;

(*d*) a tank level indicating system;

(*e*) emergency lighting;

(*f*) heel and trim indicators; and

(*g*) a permanently mounted ballast schematic diagram.

(10) The main and secondary ballast control stations required by subsections (8) and (9) shall be located above the waterline in the final condition of equilibrium after flooding when the platform is in a damaged condition.

(11) Every column-stabilized mobile platform shall have a ballast system that is capable, with any ballast pump out of operation,

(*a*) of providing safe handling and operation of the platform under normal operating and transit conditions;

(*b*) of restoring the platform to a normal operating or transit draft and level trim from an inclination of 15 degrees in any direction; and

(*c*) of raising the platform from the deepest operating draft to severe storm draft within three hours.

(12) Every floating platform shall be equipped with a bilge system that has at least two bilge pumps connected to the bilge main and that is capable, under all conditions from upright to 15 degrees in

any direction, of pumping or draining any watertight compartment except for those spaces permanently designated for the storage of fresh water, water ballast, fuel oil or liquid cargo and for which other effective means of pumping are provided.
(13) No floating platform shall be considered to comply with this section until the ballast and bilge system has been assessed through a failure modes and effects analysis.

Watertight Integrity of Floating Platforms

58. (1) The boundaries of watertight compartments in a floating platform shall contain no more openings than necessary for the operation of the platform and, where penetration of those boundaries is necessary for access, ventilation, piping and cables or any other similar purpose, arrangements shall be made to maintain the strength and watertight integrity of the boundaries.
(2) Every watertight boundary and associated closing appliance on a floating platform shall be of sufficient strength and tightness of closure to withstand without failure the pressure and other loads likely to occur in service.
(3) All watertight doors and hatches on a floating platform shall be operable locally from both sides of the associated bulkhead or deck.
(4) Side scuttles and windows on a floating platform shall be of the non-opening type, fitted with internal hinged deadlight covers.
(5) All pipes and ducts on a floating platform shall, where possible, be routed clear of those compartments that are vulnerable to penetration damage or, where such routing is not possible, positive means of closure of those pipes and ducts shall be provided for each watertight boundary.
(6) Every valve required at a watertight boundary on a floating platform shall be remotely operable from the ballast control station or by a mechanical means from another readily accessible position that is above the waterline in the final condition of equilibrium that could result when the platform is in a damaged condition.
(7) Every inlet or discharge port on a floating platform that is submerged at maximum operating draught shall be fitted with a valve that is remotely controlled from the ballast control station, and each such valve shall close automatically when the source of power fails, unless safety considerations require that it remain open.
(8) Every discharge port on a floating platform that penetrates a boundary to a compartment intended to be watertight shall be fitted with an automatic non-return valve and with a second such valve or with a device whereby the port may be closed from a position outside and above the compartment.
(9) Every door or hatch on a floating platform used to ensure the watertight integrity of internal access openings during the operation of the platform shall, while the platform is afloat, be equipped with an indicator at the ballast control station to indicate whether the door or hatch is open or closed.
(10) Every door or hatch on a floating platform that is normally closed while the platform is afloat shall be equipped

(*a*) with an alarm system that is triggered in a manned control station when the door or hatch is open; and

(*b*) with a notice affixed to that door or hatch cover to the effect that the door or hatch cover is not to be left open while the platform is afloat.

(11) All external openings on a floating platform, except manholes that are fitted with close-bolted watertight covers and that are kept permanently closed while the platform is afloat, shall, in the intact condition or in a damaged condition, be completely above any waterline associated with the platform being heeled because of wind forces.
(12) Every external opening on a floating platform that becomes wholly or partially submerged when the platform is at the maximum angle of heel that could occur while the platform meets the area ratio requirement for intact and damage stability set out in the Code referred to in subsection 56(9) or that may become intermittently submerged because of wave action when the platform is in a damaged condition shall

(*a*) be designed and constructed to withstand any sea condition without penetration;

(*b*) in the case of an opening that may become intermittently submerged when the platform is in a damaged condition,

(i) close automatically when submerged,

(ii) be readily and quickly closable at any time, or

(iii) be assumed to be open in the damage stability calculations made pursuant to section 56;

(*c*) in the case of an external opening that cannot be quickly closed,

(i) be assumed to be open in the damage stability calculations made pursuant to section 56, or

(ii) be permanently closed when the platform is afloat;

(*d*) in the case of a door or hatch that may be used during operation of the platform, be equipped with closing appliances that are operable locally from both sides of the bulkhead or deck;

(*e*) in the case of a door or hatch that may become intermittently submerged when the platform is in a damaged condition,

(i) be equipped with an indication system to show in the ballast control station the status of the closing appliances,

(ii) be self-closing on being submerged, or readily and quickly closable, and

(iii) bear a notice to the effect that the door or hatch is not to be left open during operation of the platform;

(*f*) in the case of a ventilator or ventilation intake or outlet that may be used during operation of the platform,

(i) be equipped with a self-activating anti-flooding device, or

(ii) if it is an intake or outlet not subject to intermittent submergence when the platform is in a damaged condition, be fitted with a manually operated means of closure that is readily accessible;

(*g*) in the case of a closing appliance that is not to be opened during operation of the platform, bear a notice to that effect;

(*h*) in the case of air pipes to a ballast tank, be equipped with an anti-flooding device; and

(*i*) in the case of a chain locker opening on a column-stabilized platform, except where the chain locker is kept full of water or is designed to be free-flooding, be fitted with a device that will prevent significant ingress of water in the event of submergence and with a suitable means for pumping out, both of which are remotely operable from a ballast control station.

(13) All of the closing appliances required by subsection (12) shall be able to withstand without failure any wave impact load to which they may be subjected.

(14) Every compartment on a floating platform required to remain watertight to comply with the intact and damage stability criteria described in section 56 shall incorporate a device suitably positioned to detect flooding and, where flooding occurs, trigger an alarm in a ballast control station.

Mooring

59. (1) The mooring system for a floating platform shall

(*a*) provide an anchor pattern that keeps all anchor lines, anchor chains and anchors a safe distance from existing pipelines, flow lines and other platforms;

(*b*) provide an anchor pattern that gives clear access to any support vessel intended to be used in operations and that clears lifeboat launching areas;

(*c*) be sufficiently stiff so that the excursions of the platform are within the limits established for the risers in accordance with section 61 under all operating conditions; and

(*d*) be sufficiently strong so that the failure of any anchor line during operations will not lead to major damage.

(2) The load factor for tension in the mooring lines of every floating platform, based on a quasi-static analysis, shall be

(*a*) in the operating condition with all lines intact, 3.0;

(*b*) in the operating condition with one line failed, 2.0;

(*c*) in the survival condition with all lines intact, 2.0;

(*d*) in the survival condition with one line failed, if the platform will not threaten another platform used for the exploration or exploitation of subsea resources, l.4; and

(*e*) in the survival condition with one line failed, if the platform may threaten another platform used for the exploration or exploitation of subsea resources, 2.0.

(3) The fatigue life of the mooring system of every floating platform shall be equal to at least 15 years.

(4) The mooring system of every floating platform that is to remain at the production site or drill site for longer than five years shall be designed so that its components can be inspected and replaced.
(5) The design of the mooring system of every floating platform that is intended to remain moored in the survival condition shall be based on an appropriate model test or numerical analysis.
(6) Where there is an annual probability of 10^{-2} of ice or icebergs being present at the site of a floating platform, the mooring system of the platform shall

(*a*) incorporate a primary quick release system with a remote triggering device and at least one back-up system; and

(*b*) have been demonstrated to be capable of permitting the quick release of the platform from its moorings and risers.

(7) Except where the floating platform may threaten another platform used for the exploration or exploitation of subsea resources, the following factors may be taken into account in determining whether a thruster-assisted mooring system using a remote control thruster system complies with subsection (2):

(*a*) if the remote control is manual,

(i) zero thrust, for the operating condition,

(ii) 70 per cent of the net thrust effect from all except one thruster, for the survival condition,

(iii) zero thrust, for one mooring line failed in the operating condition, and

(iv) 70 per cent of the net thrust effect from all thrusters, for one mooring line failed in the survival condition; and

(*b*) if the remote control is automatic,

(i) the net thrust effect from all except one thruster, for the operating condition,

(ii) the net thrust effect from all except one thruster, for the survival condition,

(iii) the net thrust from all thrusters, for one mooring line failed in the operating condition, and

(iv) the net thrust from all thrusters, for one mooring line failed in the survival condition.

(8) Mooring system components on a floating platform that interface with the mooring chain or rope, except the attachment in the chain locker for anchor chain and the steel rope attachment on the drum, shall be designed to withstand the forces due to tension required to break the chain or rope.
(9) The mooring system for a floating platform shall be designed to keep the platform on location, under any ice loads to which it may be subjected as determined pursuant to section 44, and the chain or rope shall be able to withstand, without significant damage, the abrasion forces imposed by such loads.
(10) The load factors between the estimated anchor holding power in the mooring system of a floating platform and maximum mooring line tension at the anchor shall be at least

(*a*) in the operating condition with all lines intact, 2.1;

(*b*) in the operating condition with one line failed, 1.4;

(*c*) in the survival condition with all lines intact, 1.4;

(*d*) in the survival condition with one line failed, if the platform will not threaten another platform used for the exploration or exploitation of subsea resources, 1.0; and

(*e*) in the survival condition with one line failed, if the platform may threaten another platform used for the exploration or exploitation of subsea resources, 1.4.

(11) For the purposes of paragraphs (2)(*d*) and (*e*), subsection (7) and paragraphs (10)(*d*) and (*e*), one platform shall be considered to threaten another platform if the platform may drift or be pushed, by environmental conditions, into the other platform when all lines fail, taking into account any action likely to be taken to bring the platform under control.
(12) All anchor winches and their stoppers, brakes, fairleads and sheaves, their attachments to the hull, and associated load- bearing structural elements for a floating platform shall be designed to withstand, without risk of permanent deformation or failure or of loss of ability to operate, the application of the breaking load of the associated anchor line with the anchor line in the most unfavourable direction.
(13) The catenary mooring system on every floating platform shall be inspected in accordance with the requirements of American Petroleum Institute RP 21, *Recommended Practice for In-Service Inspection of Mooring Hardware for Floating Drilling Units*.

60. (1) The dynamic positioning system used to hold a floating platform in position at the production site or drill site shall be designed, constructed and operated so that the failure of any main component with an annual failure rate of greater than 0.1, as determined from a detailed reliability analysis, cannot result in major damage to the platform, as determined from a failure modes and effects analysis of the main components, unless

(*a*) operational procedures for the dynamic positioning system avoid or take into account the effect of the failure of the single component; or

(*b*) every such component is routinely replaced so that the failure rate, as determined from the detailed reliability analysis, is not greater than 0.1 for the period between replacements.

(2) Every floating platform with a dynamic positioning system shall be equipped with an alert and response display system that demonstrates

(*a*) the position of the platform relative to the production site or drill site; and

(*b*) the percentage of the available power that is necessary to maintain the platform in a position relative to the site and that will permit the installation to continue to operate.

Subsea Production Systems

61. (1) Every subsea production system shall be designed to withstand major damage under the loads listed in Part B, Section 4, of Det norske Veritas Guideline No. 1-85, *Safety and Reliability of Subsea Production Systems*.

(2) Where the concept safety analysis required by section 43 indicates a risk of damage to the subsea production system components from ice, dropped objects, trawl board nets or anchors, the design of the system shall include measures to minimize such damage.

(3) The rigid risers in the subsea production system of a fixed platform and the steel flowlines and flowline connectors in every subsea production system shall comply with National Standard of Canada CAN/CSA-Z187-M87, *Offshore Pipelines*.

(4) Every subsea production system and its components shall be subjected to equipment integration tests in accordance with section 7.2 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(5) Every subsea production system shall be installed in accordance with section 7.3 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(6) Every subsea wellhead system and subsea tree located in a caisson, silo, or glory hole shall be designed and installed in such a manner that

(*a*) the effect of silting is minimized; and

(*b*) where practicable, inspection and maintenance during its production or injection life is possible.

(7) Every subsea production riser shall be designed and operated in accordance with section 6 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(8) Every subsea production riser shall be designed

(*a*) to withstand the maximum pressure to which the riser may be subjected during its service life;

(*b*) so that every component that is used to transport oil or gas from the seafloor to the production installation can withstand without failure the wellhead shut-in pressure, except where the component is equipped with an isolation valve at the seafloor and a pressure relief system at the platform to relieve the internal pressure of the component; and

(*c*) to withstand any ice loads to which it may be subject as determined pursuant to section 44, except where failure of the riser will not lead to uncontrolled pollution.

(9) Flexible flowlines and risers in a subsea production system shall be designed in accordance with American Petroleum Institute RP 17B, *Recommended Practice for Flexible Pipe*.

(10) The end fittings of flexible flowlines or risers in a subsea production system shall have pressure integrity and load-bearing capacities greater than that of the pipe.

(11) The fatigue life of risers in a subsea production system shall be at least three times the service life of the production riser.

(12) Adequate provision shall be made in the design of the risers in a subsea production system and in the configuration of their individual components, including production, injection, control and

instrumentation lines and their attachment assemblies, for the safe and efficient maintenance and inspection of the risers and their components during their service life.

(13) The analysis required by section 40 of the risers in a subsea production system in relation to fatigue and stress of the riser components and risk to the personnel and equipment as a result of failure or malfunction of individual components of the risers shall be performed using the methodology specified in section 6.5 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(14) Every riser in a subsea production system shall be equipped so that it can be disconnected

(*a*) before heave or excursion limits specified in the operations manual are exceeded; or

(*b*) when ice conditions pose a threat of major damage to the production platform.

(15) Every riser on a subsea production system shall be equipped so that after it has been disconnected and reconnected it can be pressure tested in accordance with the procedures stipulated in the operations manual.

(16) Every component of the riser in a subsea production system that is used to convey the pool fluids to the surface, inject fluids or chemicals into the pool, or transport processed or treated fluids to or from the production installation shall be designed and equipped so that when the fluids pose a threat to the environment, the component can be displaced with water or securely isolated before the riser is disconnected.

(17) The templates and manifolds in a subsea production system shall be designed and operated in accordance with section 5 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(18) The control systems, including control lines and pressurized control fluids, of every subsea production system shall be designed and operated in accordance with section 4 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

(19) Every subsea production system intended for manned intervention in an atmospheric chamber shall be designed in accordance with the requirements of Part B, Section 11, of Det norske Veritas Guideline No. 1-85, *Safety and Reliability of Subsea Production Systems*.

PART III

CONSTRUCTION AND INSTALLATION

General

62. (1) Every platform shall be fabricated and constructed in accordance with

(*a*) for a steel platform, sections 17, 18, 19, 20 and 21 of Canadian Standards Association CAN/CSA-S473-92, *Steel Structures, Offshore Structures*;

(*b*) for a concrete platform, section 11 of Canadian Standards Association Preliminary Standard S474-M1989, *Concrete Structures*;

(*c*) for a gravity-base, fill, fill-retention or piled platform, sections 6.3, 7.3, 8.3 or 9.4, respectively, of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*; and

(*d*) in respect of the foundation, section 5.4 of Canadian Standards Association CAN/CSA-S472-92, *Foundations, Offshore Structures*.

(2) Every vessel or barge used for the construction, transportation, up-ending or positioning of an installation or a component of an installation shall

(*a*) be classified by a classification society or have documentation to prove that a similar verification process has taken place;

(*b*) if manned, be equipped with lifesaving appliances in accordance with the *Life Saving Equipment Regulations*, as if it were in waters to which those Regulations apply; and

(*c*) be certified by the owner as being capable of performing the assigned task or tasks safely and as being otherwise fit for the services it is expected to provide.

(3) All slings, wire cables, shackles and any other component used for lifting and for securing loads during the construction, transportation, up-ending or positioning of an installation or a component of an installation shall have a minimum load factor of 3.

(4) Where loads developed during movement of a platform from the construction site to the production site or drill site or during installation operations are in excess of those that will be

encountered after installation, the platform shall be provided with load- and strain-measuring devices during the movement or installation of the platform.

PART IV

OPERATIONS AND MAINTENANCE

Manual, Plans and Programs for Installations

63. (1) Subject to subsection (2), every operator shall prepare, in respect of every installation, for approval pursuant to section 6 of the *Newfoundland Offshore Petroleum Drilling Regulations* and subsection 51(1) of the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations*, an operations manual that contains the following data:

(*a*) limitations on the operation of the installation and its equipment;

(*b*) information as to environmental conditions at the site where the installation will be installed and the effect of those conditions on the installation, including

(i) environmental conditions for which an installation will be evacuated and the meteorological forecast following which such evacuation will be initiated,

(ii) the amount of snow and ice that may be allowed to accumulate on the installation,

(iii) the amount of marine growth that may be allowed to accumulate on the installation, and

(iv) for a mobile platform, any operating limits imposed by environmental conditions and the effect of wind, sea, snow, ice and marine growth on the strength, stability and seaworthiness of the platform while in transit, in the operating condition or in the survival condition;

(*c*) for a fixed platform, the characteristics of the platform foundation, bottom penetration and the maximum permitted amount of scour or other changing seabed conditions;

(*d*) for a mobile platform that is supported by the seabed,

(i) information concerning the different seabed conditions acceptable for the installation, including the varying capacity of the seabed, limiting values of seabed slope, and maximum and minimum penetrations of footings, and

(ii) a program for inspecting for scour at regular intervals and after storms of a specified intensity;

(*e*) for a floating mobile platform, information concerning stability, including all data and instructions necessary to determine whether any intended configuration of, or change to, the loading or ballasting will satisfy the stability requirement for the platform;

(*f*) information concerning permissible deck loads, variable load limits and preloading;

(*g*) details of any colour coding system used on the installation for the safety of personnel;

(*h*) information on corrosion protection systems used and any requirements for the safety and maintenance of the systems;

(*i*) details of openings and means of closure in watertight compartments;

(*j*) drawings that show

(i) the general arrangement of the deck structure, accommodation areas, helideck and equipment contained on the topside facilities,

(ii) for a fixed steel platform, the jacket, piling, risers and conductors,

(iii) for a gravity-base platform and a fill-retention platform, the lower concrete or steel platform including any skirt arrangements or piling, the deck structure connection to the lower structure, the risers and the conductors,

(iv) for a self-elevating mobile platform, the main and supporting platforms, the equipment for the elevating and lowering of the deck structure and any arrangements for towing,

(v) for a column-stabilized mobile platform, the main and support structure, the method for maintaining the station and arrangement for towing,

(vi) for a surface mobile platform and any similar-shaped platform, the hull structure and the positioning equipment,

(vii) for a fill platform, the erosion protection and a cross-section of the platform including the locations of the conductors,

(viii) the locations of escape routes, fixed fire- extinguishing systems and life-saving appliances,

(ix) the fire divisions and the location of associated equipment, such as fire dampers,

(x) the location of the hazardous areas on the installation, and

(xi) for a floating mobile platform, the ballast and bilge systems and all openings and means of closure that could affect the stability of the platform;

(*k*) the operating and maintenance requirements for all the lifesaving appliances on the installation;

(*l*) the maximum helicopter weight and wheel centres, and maximum size of the helicopter for which the helicopter deck on the installation has been designed, including the extent of the obstacle-free approach zone for the helicopter;

(*m*) special arrangements or facilities for the inspection and maintenance of the installation, any equipment or plant, and any crude oil storage facilities on or in the installation;

(*n*) special precautions or instructions to be followed when repairs or alterations to the installation are to be carried out;

(*o*) any special operational or emergency requirements covering essential features of the installation, including the shutdown systems;

(*p*) a description of any equipment for elevating and lowering the installation and of any special types of joints, including details of their purpose, proper operation and maintenance;

(*q*) for a fixed platform, details of the air gap or freeboard;

(*r*) for a mobile platform, the means of ensuring that the air gap requirements determined in accordance with subsection 50(1) are met;

(*s*) the environmental loads the anchors can sustain to keep the installation moored in place, including the estimated holding power of the anchors in relation to the soil at the drill site or production site;

(*t*) for a floating platform,

(i) procedures for dealing with the excursion of the platform because of the failure of any anchor line, as determined by analysis,

(ii) where there is a thruster-assisted mooring system, procedures to control operations when thruster power is lost, and

(iii) where there is a dynamic positioning system, a description of the capability of that system in all operational and survival conditions within stated tolerances, when any single source of thrust has failed and full power is being supplied for all foreseeable operations and emergency services;

(*u*) details of the number of persons to be accommodated during normal operations;

(*v*) brief particulars of all the equipment on the installation, including flow sheets and instructions for the installation, operation and maintenance of the equipment;

(*w*) the procedure for preparing, and the description and format for, periodic reports concerning the integrity of the installation; and

(*x*) a procedure for notifying the Chief of any situation or event described in section 67.

(2) The part of the operations manual relating to the subsea production system shall comply with the requirements of sections 7.4 and 7.5 of American Petroleum Institute RP 17A, *Recommended Practice for Design and Operation of Subsea Production Systems*.

64. Every mobile platform shall be certified in accordance with the *International Convention on Load Lines, 1966*.

65. Every operator of an installation shall at all times operate the installation in accordance with limitations imposed by the certificate of fitness and by these Regulations and in accordance with the operations manual.

66. Every operator of an installation shall develop and implement an inspection and monitoring, a maintenance and a weight control program.

Repair, Replacement and Modification of Installations

67. (1) Subject to subsection (2), no holder of a certificate of fitness in respect of an installation shall make any repair, replacement or modification to the installation, or bring on board any equipment, that could affect the strength, stability, integrity, operability or safety of the installation, without the approval of the Chief and the certifying authority.

(2) In an emergency, the operator of an installation may repair or modify the installation when the manager of the installation considers that the delay required to comply with subsection (1) would

endanger personnel or the environment.
(3) Where an operator makes a repair or modification to an installation pursuant to subsection (2), the operator shall immediately notify the Chief and the certifying authority.
(4) The operator of an installation shall notify the certifying authority and the Chief immediately if the operator notices any deterioration of the installation that could impair the safety of the installation or damage the environment.

Remedial Action

68. Where an inspection reveals conditions that threaten the integrity of the foundation or platform of an installation, the operator shall take remedial action to restore the integrity of the installation to the satisfaction of the certifying authority.

PART V

RECORDS AND REPORTING

General

69. The international system of units (SI) shall be used for recording the data and preparing the reports required by these Regulations.

Report of Loss, Emergency or Accident

70. (1) Every operator shall inform the Chief, by the most rapid and practical means, of any situation or event involving any danger or accident to a person or property, including loss of life, a missing person, serious injury to a person, an imminent threat to safety of personnel or the public, fire, explosion, loss of well control, hydrocarbon or toxic fluid spills, or significant damage to a pipeline, equipment or an installation.
(2) Every operator shall submit a full written report to the Chief of any situation or event referred to in subsection (1) as soon as practicable.
(3) Every operator shall inform the Chief by the most rapid and practical means, at least twenty-four hours before any of the following events is scheduled to take place, of the time and place and the nature of the event:

(*a*) start of “tow out” of an installation;
(*b*) any lift at a production site in excess of 500 tonnes; and
(*c*) the up-ending or setting on bottom of an installation.

PART VI

OFFENCES

71. The contravention of any of the provisions of Parts IV and V is an offence under the Act.

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