



**RULES
FOR THE CLASSIFICATION AND CONSTRUCTION
OF MOBILE OFFSHORE DRILLING UNITS**

**PART V
FIRE SAFETY**

January
2024

GDAŃSK

RULES FOR CLASSIFICATION AND CONSTRUCTION OF MOBILE OFFSHORE DRILLING UNITS

developed and edited by Polski Rejestr Statków S.A., hereinafter referred to as PRS, consist of the following Parts:

- Part I – Classification Regulations
- Part II – Construction, Strength and Materials – under development
- Part III – Subdivision, Stability and Freeboard – under development
- Part IV – Machinery Installations
- Part V – Fire Safety
- Part VI – Electrical Installations
- Part VII – Helicopter Facilities– under development

whereas the materials and welding shall comply with the applicable requirements specified in *Part IX – Materials and Welding* of the *Rules for Classification and Construction of Sea-going Ships*.

This *Part V* was approved by the PRS Board on 21 December 2023 and enters into force on 1 January 2024.

This *Part V* is extended and supplemented by the following Publications:

- Publication 51/P – Procedural Requirements for Service Suppliers.
- Publication 29/I – Guidelines for Periodical Inspections of Fire-Extinguishing Systems and Appliances Used on Ships.

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1 GENERAL REQUIREMENTS

1.1 Introduction

This *Part V* has been developed in the editorial layout reflecting the layout of technical requirements contained in [Chapter 1, 9, 14 and 15 of the Code for the construction and equipment of mobile offshore drilling units \(MODU Code, the “Code” in short\)](#) and [IACS Unified Requirements – UR](#), cited in the original version, treated as a source documents, marked in the text with the appropriate colour of the font. At the end of the paragraph/ section there is the name and number of the paragraph/ section of the source document.

The text of this *Part V* contains additional and specific PRS requirements/ recommendations/ interpretations, which are marked in black.

The purpose of such an editorial layout is an easy verification the implementation of all applicable requirements and in the future to simplify procedure of implementing into *Rules* subsequent changes of the source documents.

At the end, there is a summary of currently applicable IMO documents and IACS Resolutions related to this *Part V*.

1.2 Application

1.2.1 This *Part V* applies to structural fire protection, fire-extinguishing systems, fire/gas detection and alarm systems, and fire-fighting equipment used on mobile offshore drilling units, of all types, as defined in section 1.3, hereinafter referred to as “units”, which receive a class mark in accordance with par. 3.2 of *Part I* of the *Rules (MODU Code, 1.2.1)*.

1.2.2 Where in the text of this *Part V* reference is made to *the SOLAS Convention* or the *FSS Code* for specifying fire protection requirements, the *Rules for the Classification and Construction of Sea-going Ships, Part V, Fire protection*, containing such requirements, may be applied.

1.2.3 Whenever this *Part V* leaves certain technical solutions to the discretion of the Administration, PRS, acting as Recognized Organisation (RO), will make relevant decisions in cooperation with the Administration, in accordance with the provisions of the relevant Agreement with the Administration.

1.3 Definitions

Definitions of the general terminology used in this *Part V* of the *Rules* are given in *Part I – Classification Regulations*.

For the purpose of this *Part V*, unless expressly provided otherwise, the terms used therein have the meanings defined in this section.

1.3.1 *“A” class divisions* are those divisions formed by bulkheads and decks which comply with the following criteria:

- .1 they are constructed of steel or other equivalent material;
- .2 they are suitably stiffened;
- .3 they are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "A-60"	60 min
class "A-30"	30 min

class "A-15" 15 min
class "A-0" 0 min

- .4 they are constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and
- .5 the Administration has required a test of a prototype bulkhead or deck in accordance with the *FTP Code* to ensure that it meets the above requirements for integrity and temperature rise (*MODU Code*, 1.3.2).

1.3.2 Accommodation spaces are those used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, pantries containing no cooking appliances and similar spaces. Public spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces (*MODU Code*, 1.3.3).

1.3.3 Administration means the Government of the State whose flag the unit is entitled to fly (*MODU Code*, 1.3.4).

1.3.4 "B" class divisions are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following criteria:

- .1 they are constructed of approved non-combustible materials and all materials used in the construction and erection of "B" class divisions are non-combustible, with the exception that combustible veneers may be permitted provided they meet other appropriate requirements of this *Part V* (chapter);
- .2 they have an insulation value such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15" 15 min
class "B-0" 0 min
- .3 they are constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test; and
- .4 the Administration has required a test of a prototype division in accordance with the *FTP Code* to ensure that it meets the above requirements for integrity and temperature rise (*MODU Code*, 1.3.7).

1.3.5 "C" class divisions are divisions constructed of approved non-combustible materials. They need to meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet the requirements of this *Part V* (chapter) (*MODU Code*, 1.3.8).

1.3.6 Column-stabilized unit is a unit with the main deck connected to the underwater hull or footings by columns or caissons (*MODU Code*, 1.3.11).

1.3.7 Continuous "B" class ceilings or linings are those "B" class ceilings or linings which terminate only at an "A" or "B" class division (*MODU Code*, 1.3.12).

1.3.8 Control stations are those spaces in which the unit's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment or the dynamic positioning control system is centralized or where a fire-extinguishing system serving various locations is situated. In the case of column-stabilized units, a centralized ballast control station is a "control station". However, for purposes of the application of this *Part V* (chapter 9), the space where the emergency source of power is located is not considered as being a control station (*MODU Code*, 1.3.13).

1.3.9 *D or D-value* means the largest dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor path plane or helicopter structure (*MODU Code*, 1.3.14).

1.3.10 *Emergency source of electrical power* is a source of electrical power intended to supply the necessary services in the event of failure of the main source of electrical power (*MODU Code*, 1.3.19).

1.3.11 *Emergency switchboard* is a switchboard which, in the event of failure of the main system of electrical power supply, is directly supplied by the emergency source of electrical power and/or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services (*MODU Code*, 1.3.20).

1.3.12 *Enclosed spaces* are spaces delineated by floors, bulkheads and/or decks which may have doors or windows (*MODU Code*, 1.3.21).

1.3.13 *FSS Code* means the *International Code for Fire Safety Systems*, adopted by the Maritime Safety Committee of IMO by resolution MSC.98(73), as amended (*MODU Code*, 1.3.23).

1.3.14 *FTP Code* means the *International Code for Application of Fire Test Procedures*, adopted by the Maritime Safety Committee of IMO by resolution MSC.61(67), as amended (*MODU Code*, 1.3.24).

1.3.15 *Gastight door* is a solid, close-fitting door designed to resist the passage of gas under normal atmospheric conditions (*MODU Code*, 1.3.25).

1.3.16 *'H' class divisions* are those divisions which meet the same requirements as "A" class divisions, as defined in SOLAS regulation II-2/3, except that, when tested according to the *FTP Code*, the furnace control temperature curve was replaced with the furnace control temperature curve for hydrocarbon fires defined in national or international standards* (*MODU Code*, 1.3.26).

* Refer to national standards such as: BS EN 1363-2:1999 *Fire resistance tests. Alternative and additional procedures; or ASTM 1529-14a Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies; or ISO/DIS 20902 1 Fire test procedures for divisional elements that are typically used in oil, gas and petrochemical industries – Part 1: General requirements.*

1.3.17 *Hazardous areas* are all those areas where, due to the possible presence of a flammable atmosphere arising from the drilling operations, the use without proper consideration of machinery or electrical equipment may lead to fire hazard or explosion (*MODU Code*, 1.3.27).

1.3.18 *Helideck* is a purpose-built helicopter landing platform located on a mobile offshore drilling unit (MODU) (*MODU Code*, 1.3.28).

1.3.19 *Low-flame spread* means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the *FTP Code* (*MODU Code*, 1.3.32).

1.3.20 *Machinery spaces* are all machinery spaces of category A and all other spaces containing propelling machinery, boilers and other fired processes, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air-conditioning machinery and similar spaces; and trunks to such spaces (*MODU Code*, 1.3.34).

1.3.21 *Machinery spaces of category A* are all spaces which contain internal combustion-type machinery used either:

- .1 for main propulsion; or

.2 for other purposes where such machinery has in the aggregate a total power of not less than 375 kW;
or which contain any oil-fired boiler or oil fuel unit; and trunks to such spaces (*MODU Code*, 1.3.35).

1.3.22 Main source of electrical power is a source intended to supply electrical power for all services necessary for maintaining the unit in normal operational and habitable conditions (*MODU Code*, 1.3.36).

1.3.23 Main switchboard is a switchboard directly supplied by the main source of electrical power and intended to distribute electrical energy to the unit's services (*MODU Code*, 1.3.38).

1.3.24 Mobile offshore drilling unit (MODU) or unit is a vessel capable of engaging in drilling operations for the exploration for or exploitation of resources beneath the seabed such as liquid or gaseous hydrocarbons, sulphur or salt (*MODU Code*, 1.3.41).

1.3.25 Non-combustible material is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the *FTP Code* (*MODU Code*, 1.3.43).

1.3.26 Oil fuel unit is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure more than 0.18 N/mm². Oil transfer pumps are not considered oil fuel units (*MODU Code*, 1.3.45).

1.3.27 Semi-enclosed locations are locations where natural conditions of ventilation are notably different from those on open decks due to the presence of structures such as roofs, windbreaks and bulkheads and which are so arranged that dispersion of gas may not occur (*MODU Code*, 1.3.49).

1.3.28 Service spaces are those used for galleys, pantries containing cooking appliances, lockers and store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces (*MODU Code*, 1.3.50).

1.3.29 Standard fire test is a test in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve in accordance with the test method specified in the *FTP Code* (*MODU Code*, 1.3.52).

1.3.30 Steel or equivalent material means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation)(*MODU Code*, 1.3.53).

1.3.31 Watertight means the capability of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed (*MODU Code*, 1.3.58).

1.3.32 Weathertight means that in any sea conditions water will not penetrate into the unit (*MODU Code*, 1.3.59).

1.3.33 Working spaces are those open or enclosed spaces containing equipment and processes, associated with drilling operations, which are not included in *hazardous areas* and *machinery spaces* (*MODU Code*, 1.3.60).

1.4 Exemptions

An Administration may exempt any unit which embodies features of a novel kind from any of the requirements of this *Part V* (the Code) the application of which might impede research into the development of such features. Any such unit shall, however, comply with safety requirements which, in the opinion of that Administration, are adequate for the service intended and are such as to ensure the overall safety of the unit. The Administration which allows any such exemption shall list such exemptions on the certificate and communicate to IMO the particulars, together with the reasons therefor, so that IMO may circulate the same to other Governments for the information of their officers (*MODU Code*, 1.4).

1.5 Equivalent

1.5.1 Where this *Part V* (the Code) provides that a particular detail of design or construction, fitting, material, appliance or apparatus, or type thereof, shall be fitted or carried in a unit, or that any particular provision shall be made, the Administration may allow any other detail of design or construction, fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made in that unit, if it is satisfied by trial thereof or otherwise that such detail of design or construction, fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that provided for in this *Part V* (the Code) (*MODU Code*, 1.5.1).

1.5.2 When an Administration ~~so~~ allows ~~that~~ any fitting, material, appliance, apparatus, item of equipment or type thereof, or provision, procedure, arrangement, novel design or application to be substituted, it shall communicate to IMO the particulars thereof, together with a report on the evidence submitted, so that IMO may circulate the same to other Governments for the information of their officers (*MODU Code*, 1.5.2).

1.6 Additional requirements of Administration

When designing the unit, attention shall be directed to the appropriate governmental authority in each case, as there may be additional requirements, depending on the size, type and intended service of the units as well as other particulars and details. Consideration will be given to fire protection arrangements and fire extinguishing systems which comply with the published requirements of the governmental authority of the country in which the unit is to be registered.

Also, attention shall be directed to this *Part V*, (chapter 9 of *MODU Code*), which contains minimum requirements for structural fire protection (IACS UR D11.1.2/Rev.4/Corr.1).

1.7 Alternative design and arrangements

When fire safety design or arrangements deviate from the prescriptive requirements of this *Part V* (the Code), engineering analysis, evaluation and approval of the alternative design and arrangements shall be carried out in accordance with *SOLAS* regulation II-2/17 (*MODU Code*, 9.1).

1.8 Classification documentation

Prior to the commencement of the unit construction, the below listed documentation shall be submitted to PRS Head Office for consideration and approval. In the case of units, which undergo modifications, the below listed documentation is subject to consideration and approval in the scope which covers the modifications.

1.8.1 Technical documentation

The fire safety documentation should contain descriptions/ plans/ diagrams/ lists covering:

A. Structural fire protection:

- .1 plan of structural fire protection, specifying names and fire hazard categories of the spaces, including:
 - arrangement of “H”, “A”, “B” and “C” fire class divisions, taking into account closing and openings in these divisions;
 - construction details of the fire class divisions;
 - arrangement and marking of escape routes;
 - solutions for typical penetrations of piping, cables and ventilation ducts through fire divisions;
- .2 plan of fire doors, including fire door controls;
- .3 plan of windows and sidescuttles;
- .4 plan of unit’s spaces insulation;
- .5 plan of decks covering;
- .6 plan for the equipment of unit’s spaces, including:
 - linings of walls and ceilings;
 - floor coverings;
- .7 painting plan of unit’s spaces;
- .8 plan of ventilation and air-conditioning systems, including the arrangement of ventilation ducts, air inlets and outlets and fire dampers;
- .9 plan of escape routes, emergency exits and muster stations;
- .10 list of required certificates for materials/components/structures of fire divisions used.

B. Active fire protection:

- .11 design assumptions for fire protection of the unit;
- .12 water fire main system, including the calculation of the selection of fire pumps capacities, hydraulic calculations of the required pressure at hydrants, the arrangement of fire pumps, pipelines, isolating valves and hydrants;
- .13 pressure water-spraying fire-extinguishing system for machinery spaces, including calculations of pumps capacities, hydraulic calculations of the required pressure at spraying nozzles, arrangement of pumps, section valves, pipelines and nozzles, location of pipeline sections (if provided);
- .14 water screen system, including the calculations of water supplies, arrangement of section valves, pipelines and nozzles (if provided);
- .15 fire-extinguishing system for the protection of galley exhaust duct and deep-fat cooking equipment;
- .16 fixed deck foam system for helideck, including calculations of the required amount of foam concentrate, hydraulic calculations of pipe diameters, system operation diagram, arrangement of pipes and system devices, such as: foam concentrate tanks, foam proportioners, foam monitors and foam generators;
- .17 carbon dioxide (CO₂) system or equivalent fixed gas fire-extinguishing system, including calculations of the required amount of extinguishing agent, selection of pipes and nozzles diameters based on flow hydraulic calculations, calculation of discharge time for each protected spaces, diagram of the system operation, together with warning signalling, layout of agent cylinders, starting devices, arrangement of pipes and nozzles, operation manual;
- .18 dry powder fire-extinguishing system, including the calculations of fire-extinguishing medium and the powder carrier, diagram of the system operation, the arrangement of fire-extinguishing stations, pipes and fittings (if provided);
- .19 flammable and toxic gas detection system, including the location of gas measurement and analysis panel, pipes and gas detectors, as well as electric circuits diagrams;

- .20 fire detection and fire alarm system, including electric circuits diagrams, division into sections, the arrangement of control panel, indicating units, detectors and manually operated call points;
- .21 arrangement of fire-protection equipment, i.e. portable and mobile fire-extinguishers, portable foam applicator units, fire-fighter's equipment and emergency escape breathing apparatus;
- .22 fire-extinguishing system for paint lockers and flammable liquid lockers;
- .23 list of the required certificates for the applied components/ devices of fire-extinguishing systems and fire-fighting equipment;
- .24 test program of fire extinguishing systems, fire detection and fire alarm systems, as well as gas detection systems.

C. Appliances and equipment posing additional risk of fire:

- .25 arrangements of helicopter facilities, including fire-extinguishing systems and helideck equipment;
- .26 ~~arrangements and~~ arrangement and fastening of tanks and distributing stations for fuel with a flash-point below 43°C;
- .27 plan of welding gases system.

Classification documentation shall contain material specifications, list of machinery and appliances, components of systems, as well as the necessary information allowing to assess whether structures/ appliances/ systems comply with the requirements of PRS *Rules*.

1.8.2 Operation documentation and emergency procedures

1.8.2.1 Operating manuals containing guidance for the safe operation of the unit for both normal and envisaged emergency conditions, approved by the Administration, shall be provided on board and be readily available to all concerned. The manuals shall, in addition to providing the necessary general information about the unit, contain guidance on and procedures for the operations that are vital to the safety of personnel and the unit. The manuals shall be concise and be compiled in such a manner that they are easily understood. Each manual shall be provided with a contents list, an index and wherever possible be cross-referenced to additional detailed information which shall be readily available on board (*MODU Code, 14.1.1*).

1.8.2.2 The operating manual for normal operation shall contain general descriptive information of fire-extinguishing systems and appliances, as well as guidelines for their use and periodical inspection, tests and maintenance (*MODU Code, 14.1.2*).

1.8.2.3 The operating manual for emergency operations shall contain guidelines and procedures for the conduct of the crew in foreseeable emergency situations related to the risk of fire and explosion (*MODU Code, 14.1.4*).

1.8.2.4 The information provided in the operating manuals shall, where necessary, be supported by additional material provided in the form of plans, manufacturers' manuals and other data necessary for the efficient operation and maintenance of the unit. Detailed information provided in manufacturers' manuals need not be repeated in the operating manuals. The information shall be referenced in the operating manual, readily identified, located in an easily accessible place on the unit and be available at all times (*MODU Code, 14.1.5*).

1.8.2.5 Operating and maintenance instructions and engineering drawings for fire-extinguishing systems and appliances essential to the safe operation of the unit shall be written in a language understandable by those officers and crew members who are required to understand such information in the performance of their duties (*MODU Code, 14.1.6*).

1.8.3 Helicopter facilities operating manual

1.8.3.1 The operating manual for normal operations under par. 14.1.3 of the *MODU Code* shall include a description and a checklist of safety precautions, procedures and equipment requirements (*MODU Code*, 14.2.1).

1.8.3.2 If refuelling capability is to be provided, the procedures and precautions to be followed during refuelling operations shall be in accordance with recognized safe practices and contained in the operations manual (*MODU Code*, 14.2.2).

1.8.3.3 Fire-fighting personnel, consisting of at least two persons trained for rescue and fire-fighting duties, and fire-fighting equipment shall be immediately available when the helicopter is about to land, is landing, refuelling, or during take-off (*MODU Code*, 14.2.3).

1.8.3.4 Fire-fighting personnel shall be present during refuelling operations. However, the fire-fighting personnel shall not be involved with refuelling activities (*MODU Code*, 14.2.4).

1.8.4 Training manual and onboard training aids

A training manual and onboard training aids complying with the relevant requirements of *SOLAS* regulations II-2/15 and III/35 shall be provided and relevant information made available to each person on board (*MODU Code*, 14.12).

1.9 Scope of supervision

1.9.1 The general survey regulations for classification, construction surveys and surveys of ships during service within the scope of structural fire protection, fire-extinguishing systems, as well as fire detection and fire alarm systems are given in *Part I – Classification Regulations*.

1.9.2 Fire protection structures, fire-extinguishing systems, fire detection and fire alarm systems, other fire protection systems and arrangements, the documentation of which is subject to consideration and approval, as well as appliances and systems which constitute fire risk, are subject to Administration or Recognized Organization (RO) survey during construction or alteration of the unit.

1.9.3 Structural fire protection components, fire extinguishing systems and their components and fire protection equipment shall be delivered with *Type Approval Certificate* for acceptance to Administration or RO. Instead of *Type Approval Certificate*, the above mentioned equipment may have *Certificate of Conformity with "MED Directive"*.

1.9.4 Water fire main system pumps and water-spraying systems supply pumps, are subject to acceptance and operation tests at the manufacturer's in the presence of Administration or RO Surveyor.

1.9.5 Compressed gas cylinders and pressure vessels of CO₂ fire-extinguishing systems and high pressure CO₂ manifolds, are subject to acceptance and pressure tests at the manufacturer's in the presence of Administration or RO' Surveyor.

1.9.6 During the unit service, fire-extinguishing systems and equipment used in fire protection, as well as appliances and equipment which constitute additional fire hazard, are subject to periodical inspections and attestation in accordance with *Publication 29/I – Guidelines for Periodical Inspections of Fire-extinguishing Systems and Appliances Used on Ships*.

1.9.7 Inspections, maintenance and repairs of fixed fire-extinguishing systems, fire-fighting equipment (fire-extinguishers and portable foam applicator units), breathing apparatus, EEBD-s, and laboratory tests of foam concentrates, shall be performed by service stations approved by Administration or RO.

1.9.8 Service stations applying for PRS approval shall comply with requirements contained in *Publication 51/P – Procedural Requirements for Service Suppliers*.

1.10 Onboard acceptance and tests

After being installed on the unit, fire extinguishing systems, fire detection and fire alarm systems, as well as gas detection systems, **shall be** subject to acceptance and tests according to agreed test programme.

2 STRUCTURAL FIRE PROTECTION

2.1 These requirements have been formulated principally for units having their hull superstructure, structural bulkheads, decks and deckhouses constructed of steel.

2.2 Units constructed of other materials may be accepted, provided that, in the opinion of the Administration, they provide an equivalent standard of safety.

2.3 Structural fire protection details, materials and methods of construction shall be in accordance with the *FTP Code*, as applicable, and *SOLAS* regulations II-2/5.3 and II-2/6, as applied to cargo ships.

Fire integrity of bulkheads and decks

2.4 In addition to complying with the specific requirements for fire integrity of bulkheads and decks in this section and in **chapter 3** (9.3 of the *Code*), the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9-1 and 9-2. Exterior boundaries of superstructures and deckhouses enclosing accommodation, including any overhanging decks which support such accommodation, shall be constructed to “H-60” standard for the whole of the portion which faces and is within 30 m of the centre of the rotary table. For units that have a movable substructure the 30 m shall be measured with the substructure at its closest drilling position to the accommodation. The Administration may accept equivalent arrangements.

2.5 The following provisions shall govern application of the tables:

- .1** Tables 9-1 and 9-2 shall apply respectively to the bulkheads and decks separating adjacent spaces.
- .2** For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk, as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive. The number in parenthesis preceding each category refers to the applicable column or row in the tables:
 - (1) **Control stations** are spaces as defined in section 1.3.
 - (2) **Corridors** means corridors and lobbies.
 - (3) **Accommodation spaces** are spaces as defined in section 1.3, excluding corridors, lavatories and pantries containing no cooking appliances.
 - (4) **Stairways** are interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

- (5) **Service spaces (low risk)** are lockers, store-rooms and working spaces in which flammable materials are not stored, drying rooms and laundries.
- (6) **Machinery spaces of category A** are spaces as defined in section 1.3.
- (7) **Other machinery spaces** are spaces as defined in section 1.3 other than machinery spaces of category A.
- (8) **Hazardous areas** are areas as defined in section 1.3.
- (9) **Service spaces (high risk)** are lockers, store-rooms and working spaces in which flammable materials are stored, galleys, pantries containing cooking appliances, paint rooms and workshops other than those forming part of the machinery space.
- (10) **Open decks** are open deck spaces, excluding hazardous areas.
- (11) **Sanitary and similar spaces** are communal sanitary facilities such as showers, baths, lavatories, etc., and isolated pantries containing no cooking appliances. Sanitary facilities which serve a space and with access only from that space shall be considered a portion of the space in which they are located.

Table 9-1
Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{d)}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-0
Corridors (2)		C	B-0	B-0 A-0 ^{b)}	B-0	A-60	A-0	A-0	A-0	*	B-0
Accommodation spaces (3)			C	B-0 A-0 ^{b)}	B-0	A-60	A-0	A-0	A-0	*	C
Stairways (4)				B-0 A-0 ^{b)}	B-0 A-0 ^{b)}	A-60	A-0	A-0	A-0	*	B-0 A-0 ^{b)}
Service spaces (low risk) (5)					C	A-60	A-0	A-0	A-0	*	B-0
Machinery spaces of category A (6)						* a)	A-0 ^{a)}	A-60	A-60	*	A-0
Other machinery spaces maszynowe (7)							A-0 ^{a)c)}	A-0	A-0	*	A-0
Hazardous areas (8)								–	A-0	–	A-0
Service spaces (high risk) (9)									A-0 ^{c)}	*	A-0
Open decks (10)										–	*
Sanitary and similar spaces (11)											C

See notes under table 9-2.

Table 9-2
Fire integrity of decks separating adjacent spaces

Space above — Space below	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-0
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	*
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	*
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	* a)	A-60	A-60	A-60	*	A-0
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0 ^{a)}	* a)	A-0	A-0	*	A-0
Hazardous areas (8)	A-60 ^{e)}	A-0 ^{e)}	A-0 ^{e)}	A-0 ^{e)}	A-0	A-60	A-0	–	A-0	–	A-0
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 ^{c)}	*	A-0
Open decks (10)	*	*	*	*	*	*	*	–	*	–	*
Sanitary and similar spaces (11)	A-0	A-0	*	A-0	*	A-0	A-0	A-0	A-0	*	*

Notes: to be applied to tables 9-1 and 9-2, as appropriate.

- (a) Where the space contains an emergency power source or components of an emergency power source adjoining a space containing a ship's service generator or the components of a ship's service generator, the boundary bulkhead or deck between those spaces shall be an "A-60" class division.
- (b) For clarification as to which note applies see par. 3.3. and 3.5 (9.3.3 and 9.3.5 of *the Code*).
- (c) Where spaces are of the same numerical category and superscript "c" appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g., in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- (d) Bulkheads separating the navigating bridge, chartroom and radio room from each other may be "B-0" rating.
- (e) Additional requirements for fire boundaries shall be assessed in accordance with par. 3.1 (9.3.1 of the Code).

* Where an asterisk appears in the tables, the division shall be of steel or equivalent material, but need not be of "A" class standard. However, where a deck is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke.

2.6 Continuous "B" class ceilings or linings in association with the relevant decks or bulkheads may be accepted as contributing wholly or in part to the required insulation and integrity of a division.

2.7 In approving structural fire protection details, the Administration shall consider the risk of heat transmission at intersections and terminal points of required thermal barriers. The insulation of a deck or bulkhead shall be carried past the penetration, intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures. If a space is divided with a deck or a bulkhead of "A" class standard having insulation of different values, the insulation with the higher value shall continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm.

2.8 Windows and sidescuttles, with the exception of navigating bridge windows, shall be of the non-opening type. Navigating bridge windows may be of the opening type provided the design of such windows permits rapid closure. The Administration may permit windows and sidescuttles outside hazardous areas to be of the opening type.

2.9 The fire resistance of doors shall, as far as practicable, be equivalent to that of the division in which they are fitted. External doors in superstructures and deckhouses shall be constructed to at least “A-0” class standard and be self-closing, where practicable.

2.10 Self-closing doors in fire rated bulkheads shall not be fitted with hold-back hooks. However, hold-back arrangements incorporating remote release fittings of the fail-safe type may be utilized (*MODU Code, 9.2*).

3 PROTECTION OF ACCOMMODATION SPACES, SERVICE SPACES AND CONTROL STATIONS

3.1 In general, accommodation spaces, service spaces, control stations and spaces containing vital machinery and equipment* shall not be located adjacent to hazardous areas. However, where this is not practicable, an engineering evaluation/ fire load analysis shall be performed in accordance with national or international standards** to ensure that the level of fire protection and blast resistance of the bulkheads and decks separating these spaces from the hazardous areas are adequate for the likely hazard. Where it is shown that these spaces may be exposed to a radiant heat flux in excess of 100 kW/m², the bulkhead or deck shall be constructed to at least an H-60 standard.

* *Vital machinery and equipment are those that are essential to the safety of the MODU and all personnel on board. They include, but are not limited to, fire pumps, emergency sources of power, dynamic positioning systems, remote blowout preventer activation controls, and other operational or safety systems the sudden failure of which may result in hazardous situations. This does not include spaces (e.g. the driller's cabin) located on the drill floor.*

** *Refer to standards such as: ISO 13702:2015, or API RP 2 FB.*

3.2 All bulkheads that are to be “A” class divisions shall extend from deck to deck and to the deckhouse side or other boundaries.

3.3 All bulkheads forming “B” class divisions shall extend from deck to deck and to the deckhouse side or other boundaries, unless continuous “B” class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining. In corridor bulkheads, ventilation openings may be permitted only in and under the doors of cabins, public spaces, offices and sanitary spaces. The openings shall be provided only in the lower half of the door. Where such an opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m². When such an opening is cut in a door it shall be fitted with a grille made of non-combustible material. Such openings shall not be provided in a door in a division forming a stairway enclosure.

3.4 Stairs shall be constructed of steel or equivalent material.

3.5 Stairways which penetrate only a single deck shall be protected at least at one level by “A” or “B” class divisions and self-closing doors so as to limit the rapid spread of fire from one deck to another. Personnel lift trunks shall be protected by “A” class divisions. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by “A” class divisions and protected by self-closing doors at all levels.

3.6 Air spaces enclosed behind ceilings, panellings or linings shall be divided by close fitting draught stops spaced not more than 14 m apart. In the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

3.7 Except for insulation in refrigerated compartments, insulation material, pipe and vent duct lagging, ceilings, linings and bulkheads shall be of non-combustible material. Insulation of pipe fittings for cold service systems and vapour barriers and adhesives used in conjunction with insulation need not be non-combustible but they shall be kept to a minimum and their exposed surfaces shall have low-flame spread characteristics*. In spaces where penetration of oil products is possible, the surfaces of the insulation shall be impervious to oil or oil vapours.

* Refer to *Recommendation on improved fire test procedures for surface flammability of bulkhead, ceiling and deck finish materials*, adopted by IMO by resolution A.653(16), in conjunction with *Guidelines on the evaluation of fire hazard properties of materials*, adopted by IMO by resolution A.166(ES.IV) and Annex 1, Part 1 of the *FTP Code*.

3.8 The framing, including grounds and the joint pieces of bulkheads, linings, ceilings and draught stops, shall be of non-combustible material.

3.9 All exposed surfaces in corridors and stairway enclosures and surfaces in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low-flame spread characteristics. Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low-flame spread characteristics.

3.10 Bulkheads, linings and ceilings may have combustible veneers provided that the thickness of such veneers shall not exceed 2.5 mm within any space other than corridors, stairway enclosures and control stations where the thickness shall not exceed 1.5 mm. Combustible materials used on these surfaces shall have a calorific value * not exceeding 45 MJ/m² of the area for the thickness used.

* Refer to *the recommendations published by the International Organization for Standardization*, in particular publication *ISO 1716:2002, Reaction to fire tests for building products – Determination of the heat of combustion*.

3.11 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, this being determined in accordance with the *FTP Code*.

3.12 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the *FTP Code*.

3.13 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross-sectional area not exceeding 0.02 m² need not be non-combustible, subject to the following conditions:

- .1 these ducts shall be of a material which, in the opinion of the Administration, has a low fire risk;
- .2 they may only be used at the end of the ventilation device;
- .3 they shall not be situated less than 600 mm, measured along the duct, from where it penetrates any “A” or “B” class division including continuous “B” class ceilings.

3.14 Where a thin plated duct with a free cross-sectional area equal to, or less than, 0.02 m² passes through “A” class bulkhead or decks, the opening shall be lined with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into

100 mm on each side of the bulkhead or, in the case of the deck, wholly laid on the lower side of the deck pierced. Where ventilation ducts with a cross-sectional area exceeding 0.02 m² pass through class “A” bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of penetrations through the deck or bulkhead; the ducts and sleeves at such places shall comply with the following:

- .1 the ducts or sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration.
- .2 ducts with a cross-sectional area exceeding 0.075 m², except those serving hazardous areas, shall be fitted with fire dampers in addition to meeting the requirements of par. 3.14.1 (9.3.14.1 of *the Code*). The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by “A” class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce. The Administration may, given special considerations, permit operation from one side of a division only.

3.15 In general, ventilation systems for machinery spaces of category A, galleys and hazardous areas shall be separated from each other and from the ventilation systems serving other spaces. Ducts serving hazardous areas shall not pass through accommodation spaces, service spaces, or control spaces. Ducts provided for the ventilation of machinery spaces of category A and galleys shall not pass through accommodation spaces, control stations or service spaces unless:

- .1 the ducts are constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm, having a thickness obtained by interpolation;
- .2 the ducts are suitably supported and stiffened;
- .3 the ducts are fitted with automatic fire dampers close to the boundaries penetrated; and
- .4 the ducts are insulated to “A-60” class standard from the machinery spaces or galleys to a point at least 5 m beyond each fire damper;
or
- .5 the ducts are constructed of steel in accordance with par. 3.15.1.1 and 3.15.1.2 (9.3.15.1.1 and 9.3.15.1.2 of the Code); and
- .6 the ducts are insulated to “A-60” class standard throughout the accommodation spaces, service spaces or control stations.

3.16 Ducts provided for the ventilation of accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys or hazardous areas. However, the Administration may permit a relaxation from these requirements, except for the ducts passing through hazardous areas, provided that:

- .1 the ducts where they pass through a machinery space of category A or a galley are constructed of steel in accordance with par. 3.15.1.1 and 3.15.1.2 (9.3.15.1.1 and 9.3.15.1.2 of the Code);
- .2 automatic fire dampers are fitted close to the boundaries penetrated; and
- .3 the integrity of the machinery space or galley boundaries is maintained at the penetrations;
or

- .4 the ducts where they pass through a machinery space of category A or a galley are constructed of steel in accordance with par. 3.15.1.1 and 3.15.1.2 (9.3.15.1.1 and 9.3.15.1.2 of the Code); and
 - .5 are insulated to “A-60” standard within the machinery space or galley.
- 3.17** Ventilation ducts with a cross-sectional area exceeding 0.02 m² passing through “B” class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkhead unless the duct is of steel for this length.
- 3.18** Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be of equivalent fire integrity to “A” class divisions.
- 3.19** Each galley exhaust duct shall be fitted with:
- .1 a grease trap readily removable for cleaning;
 - .2 a fire damper located in the galley end of the duct which is automatically and remotely operated and, in addition a remotely operated fire damper located in the exhaust end of the duct;
 - .3 arrangements, operable from within the galley, for shutting off the exhaust fans; and
 - .4 fixed means for extinguishing a fire within the duct.
- 3.20** The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.
- 3.21** Power ventilation of accommodation spaces, service spaces, control stations, machinery spaces and hazardous areas shall be capable of being stopped from an easily accessible position outside the space being served. The accessibility of this position in the event of a fire in the spaces served shall be specially considered. The means provided for stopping the power ventilation serving machinery spaces or hazardous areas shall be entirely separate from the means provided for stopping ventilation of other spaces.
- 3.22** Windows and sidescuttles in boundaries which are required to meet an “A-60” standard which face the drill floor area shall be:
- .1 constructed to an “A-60” standard; or
 - .2 protected by a water curtain; or
 - .3 fitted with shutters of steel or equivalent material.
- 3.23** The ventilation of the accommodation spaces and control stations shall be arranged in such a way as to prevent the ingress of flammable, toxic or noxious gases or smoke from surrounding areas (MODU Code, 9.3).

4 MEANS OF ESCAPE

- 4.1** Within the accommodation spaces, service spaces and control stations the following requirements shall be applied:
- .1 in every general area which is likely to be regularly manned or in which personnel are accommodated at least two separate escape routes shall be provided, situated as far apart as practicable, to allow ready means of escape to the open decks and embarkation stations. Exceptionally, the Administration may permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated or employed there;

- .2 stairways shall normally be used for means of vertical escape; however, a vertical ladder may be used for one of the means of escape when the installation of a stairway is shown to be impracticable;
 - .3 every escape route shall be readily accessible and unobstructed and all exit doors along the route shall be readily operable. Dead-end corridors exceeding 7 m in length shall not be permitted;
 - .4 in addition to the emergency lighting, the means of escape in accommodation areas, including stairways and exits, shall be marked by lighting or photoluminescent strip indicators placed not more than 300 mm above the deck at all points of the escape route, including angles and intersections. The marking shall enable personnel to identify the routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip will not result in the marking being ineffective. Additionally, escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Administration shall ensure that such lighting or photoluminescent equipment has been evaluated, tested and applied in accordance with the *FSS Code*.
- 4.2** Two means of escape shall be provided from each machinery space of category A. Ladders shall be of steel or other equivalent material. In particular, one of the following requirements shall be complied with:
- .1 two sets of ladders, as widely separated as possible, leading to doors in the upper part of the space, similarly separated and from which access is provided to the open deck. One of these ladders shall be located within a protected enclosure that satisfies tables 9-1 and 9-2, category (4), from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The enclosure shall have minimum internal dimensions of at least 800 mm by 800 mm, and shall have emergency lighting provisions; or
 - .2 one ladder leading to a door in the upper part of the space from which access is provided to the open deck. Additionally, in the lower part of the space, in a position well separated from the ladder referred to, a steel door capable of being operated from each side shall be provided with access to a safe escape route from the lower part of the space to the open deck.
- 4.3** From machinery spaces other than those of category A, escape routes shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed there.
- 4.4** Lifts shall not be considered as forming one of the required means of escape.
- 4.5** Superstructures and deckhouses shall be sited such that, in the event of fire at the drill floor, at least one escape route to the embarkation position and survival craft is protected against radiant heat flux levels in excess of 2.5 kW/m² emanating from the drill floor.
- 4.6** Stairways and corridors used as a means of escape shall meet the requirements of par. 13.3 of the *FSS Code (MODU Code, 9.4)*.

5 FIRE SAFETY SYSTEMS

5.1 General requirements

The unit shall be provided with fixed and portable fire extinguishing systems complying with the requirements of PRS Rules (*FSS Code*), as applicable. (IACS UR D11.3.1/Rev.4/Corr.1) (*MODU Code*, 9.5)

5.2 On-board acceptance and tests

Fixed fire-extinguishing systems, after being installed on the unit, are subject to acceptance and operation tests in accordance with the agreed acceptance and test programme.

6 EMERGENCY ESCAPE BREATHING DEVICES

6.1 Emergency escape breathing devices (EEBDs) shall comply with the *FSS Code*. Spare emergency escape breathing devices shall be kept on board to the satisfaction of the Administration.

6.2 Emergency escape breathing devices shall be provided as follows:

- .1 in machinery spaces of category A containing internal combustion machinery used for main propulsion, EEBDs shall be positioned as follows:
 - .1.1 one (1) EEBD in the engine control room, if located within the machinery space;
 - .1.2 one (1) EEBD in workshop areas. If there is, however, a direct access to an escape way from the workshop, an EEBD is not required; and
 - .1.3 one (1) EEBD on each deck or platform level near the escape ladder constituting the second means of escape from the machinery space (the other means being an enclosed escape trunk or watertight door at the lower level of the space).
 - .1.4 alternatively, a different number or location may be determined by the Administration taking into consideration the layout and dimensions or the normal manning of the space.
- .2 for machinery spaces of category A other than those containing internal combustion machinery used for main propulsion, one (1) EEBD shall, as a minimum, be provided on each deck or platform level near the escape ladder constituting the second means of escape from the space (the other means being an enclosed escape trunk or watertight door at the lower level of the space).
- .3 for other machinery spaces, the number and location of EEBDs shall be determined by the Administration (*MODU Code*, 9.6).

7 FIRE PUMPS, FIRE MAINS, HYDRANTS AND HOSES

7.1 At least two independently driven power pumps shall be provided, each arranged to draw directly from the sea and discharge into a fixed fire main. However, in units with high suction lifts, booster pumps and storage tanks may be installed, provided such arrangements will satisfy all the requirements of par. 7.1 to 7.9 (9.7.1 to 9.7.9 of the *Code*).

There are to be at least two independently driven fire pumps (IACS UR D11.2.1/Rev.4/Corr.1).

7.2 At least one of the required pumps shall be dedicated for fire-fighting duties and be available for such duties at all times.

7.3 The arrangements of the pumps, sea suction and sources of power shall be such as to ensure that a fire in any one space would not put both the required pumps out of action.

The pumps, their source of power and piping and valves are to be so arranged that a fire or flooding in any one compartment will not put all fire pumps out of action (IACS UR D11.2.1/Rev.4/Corr.1).

7.4 The capacity of the required pumps shall be appropriate to the fire-fighting services supplied from the fire main. Where more pumps than required are installed, their capacity shall be to the satisfaction of the Administration.

7.5 Each pump shall be capable of delivering at least one jet simultaneously from each of any two fire hydrants, hoses and 19 mm nozzles while maintaining a minimum pressure of 0.35 N/mm² at any hydrant. In addition, where a foam system is provided for protection of the helicopter deck, the pump shall be capable of maintaining a pressure of 0.7 N/mm² at the foam installation **and the water consumption used for foam system is to be added to the pump capacity**. If the water consumption for any other fire protection or fire-fighting purpose shall exceed the rate of the helicopter deck foam installation, this consumption shall be the determining factor in calculating the required capacity of the fire pumps.

7.6 Where either of the required pumps is located in a space not normally manned and, in the opinion of the Administration, is relatively far removed from working areas, suitable provision shall be made for remote start-up of that pump and remote operation of associated suction and discharge valves.

7.7 Except as provided in par. 7.2 (9.7.2 of *the Code*), sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil.

7.8 Every centrifugal pump which is connected to the fire main shall be fitted with a non-return valve.

7.9 Relief valves shall be provided in conjunction with all pumps connected to the fire main if the pumps are capable of developing a pressure exceeding the design pressure of the fire main, hydrants and hoses. Such valves shall be so placed and adjusted as to prevent excessive pressure in the fire main system.

7.10 A fixed fire main shall be provided and be so equipped and arranged as to meet the requirements of par. 7.10 to 7.20 (9.7.10 to 9.7.20 of *the Code*).

7.11 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from the required fire pumps operating simultaneously.

7.12 With the required fire pumps operating simultaneously, the pressure maintained in the fire mains shall be to the satisfaction of the Administration and be adequate for the safe and efficient operation of all equipment supplied therefrom.

7.13 The fire main shall, where practicable, be routed clear of hazardous areas and be arranged in such a manner as to make maximum use of any thermal shielding or physical protection afforded by the structure of the unit.

7.14 The fire main shall be provided with isolating valves located so as to permit optimum utilization in the event of physical damage to any part of the main.

7.15 The fire main shall not have connections other than those necessary for fire-fighting purposes.

7.16 All practical precautions consistent with having water readily available shall be taken to protect the fire main against freezing.

7.17 Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them.

7.18 A cock or valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are operating.

7.19 The number and position of the hydrants shall be such that at least two jets of water, not emanating from the same hydrant, one of which shall be from a single length of fire hose, may reach any part of the unit normally accessible to those on board while the unit is being navigated or is engaged in drilling operations. A hose shall be provided for every hydrant.

7.20 Fire hoses shall be of material approved by the Administration and be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be to the satisfaction of the Administration. Every fire hose shall be provided with a dual-purpose nozzle and the necessary couplings. Fire hoses, together with any necessary fittings and tools, shall be ready for use at any time and shall be kept in conspicuous positions near the water service hydrants or connections.

7.21 Fire hoses shall have a length of at least 10 m, but not more than:

- .1 15 m in machinery spaces;
- .2 20 m in other spaces and open decks; and
- .3 25 m for open decks with a maximum breadth in excess of 30 m.

7.22 Nozzles shall comply with the following:

- .1 standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.
- .2 for accommodation and service spaces, a nozzle size greater than 12 mm need not be used.
- .3 for machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure specified in par. 7.5 (9.7.5 of *the Code*) from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

Dual purpose jet spray nozzles shall be fitted throughout the unit with a minimum nozzle diameter of 12 mm for accommodation and service spaces and with a maximum diameter of 19 mm for machinery spaces and exterior locations (IACS UR D11.2.3/Rev.4/Corr.1).

7.23 The surface unit shall be provided with at least one international shore connection complying with SOLAS regulation II-2/10-2.1.7 and the *FSS Code*. Facilities shall be available enabling such a connection to be used on any side of the unit (*MODU Code*, 9.7).

7.24 Water supply shall comply with the following conditions:

- .1 at least two water supply sources (sea chests, valves, strainers and pipes) shall be provided and so arranged that one supply source failure will not put all supply sources out of action;
- .2 for the self-elevating units, the following additional fire water supply measures shall be provided:
 - 2.1 water shall be supplied from sea water main filled by at least two submersible pumping systems. One system failure will not put the other system(s) out of function; and

- 2.2** water shall be supplied from drill water system while unit lifting or lowering. Water stored in the drill water tank(s) shall be not less than 40 m³ plus engine cooling water consumptions before unit lifting or lowering. Alternatively, water may be supplied from buffer tank(s) in which sea water stored is not less the quantity as the above mentioned (IACS UR D11.2.4/Rev.4/Corr.1).

7.25 On-board acceptance and tests

The water fire main system, after being installed on the unit, is subject to acceptance and tests of operation in accordance with the agreed acceptance and test programme.

8 FIRE-EXTINGUISHING ARRANGEMENTS FOR THE DRILL FLOOR

8.1 The drill floor shall be protected by a fixed pressure water-spraying system designed to provide a minimum water application rate of 20 l/m²/min to the drill floor and related equipment, including emergency shutdown equipment, critical structural components, and enclosure fire barriers. Alternatively, multiple fixed monitors discharging at a minimum flow rate and pressure 1,900 l/min at 1 N/mm² may be provided and arranged such that all areas and equipment can be reached by at least two monitors which are widely separated.

8.2 The system shall be designed for manual release from release stations located outside the protected area. Any section valves necessary for the operation of the system shall be located outside the protected area. Automatic release may be accepted by the Administration.

8.3 Nozzles, piping, fittings and related components shall be designed to withstand exposure to temperatures up to 925°C.

8.4 The main fire pumps may be used to supply the fixed pressure water-spraying system if they have sufficient capacity to simultaneously supply the fire main at the required flow and pressure (*MODU Code*, 9.8).

8.5 Fixed fire extinguishing systems on drilling areas

- .1** A fixed water spray system shall be provided to protect drilling area. The minimum water application rate shall be not less than 20.4 l/min/m², or
- .2** At least two dual-purpose (jet/spray) fire monitors shall be installed to cover drilling and well test areas. The minimum capacity of each monitor shall be not less than 100 m³/h. The monitors may be operated either remotely or locally. Monitor arranged for local operation shall be sited on an accessible protected position (IACS UR D11.3.2/Rev.4/Corr.1).

8.6 Fixed fire extinguishing systems on mud processing area

A suitable fixed foam system shall be provided. The system shall be capable of delivering foam solution at a rate of not less than 6.5 l/min/m² (4.1 l/min/m² for Aqueous Film Forming Foam or Film-Forming Fluoroprotein Foam) for 15 minutes. Alternatively, a gas fixed fire extinguishing system may be used for enclosed mud processing spaces (IACS UR D11.3.3/Rev.4/Corr.1).

9 FIRE-EXTINGUISHING ARRANGEMENT IN MACHINERY SPACES AND IN SPACES CONTAINING FIRED PROCESSES

9.1 In spaces where main or auxiliary oil-fired boilers and other fired processes of equivalent thermal rating are situated, or in spaces containing oil fuel units or settling tanks, the unit shall be provided with the following:

- .1 one of the following fixed fire-extinguishing systems complying with *SOLAS* regulation II-2/10.4:
 - .1.1 a fixed pressure water-spraying system;
 - .1.2 a fixed gas fire-extinguishing system;
 - .1.3 a fixed high-expansion foam installation.

Where the machinery space and spaces containing fired processes are not entirely separate, or if fuel oil can drain from the latter spaces into the machinery space, the combined machinery space and fired process space shall be considered as one compartment;

- .2 at least two approved type portable foam extinguishers or equivalent in each space containing a fired process and each space in which a part of the oil fuel installation is situated. In addition, at least one extinguisher of the same description with a capacity of 9 l for each burner, whereby the total capacity of the additional extinguisher or extinguishers need not exceed 45 l for any one space.
- .3 a receptacle containing sand, sawdust impregnated with soda, or other approved dry material in such quantity as may be required by the Administration. An approved portable extinguisher may be provided as an alternative.

9.2 Spaces containing internal combustion machinery used either for main propulsion or for other purposes, when such machinery has a total power output of not less than 750 kW, shall be provided with the following arrangements:

- .1 one of the fixed arrangements required by par. 9.1.1 (9.9.1.1 of *the Code*); and
- .2 one approved foam-type extinguisher of not less than 45 l capacity or equivalent in every engine space and one approved portable foam extinguisher for each 750 kW of engine power output or part thereof. The total number of portable extinguishers so supplied shall be not less than two and need not exceed six.

9.3 The Administration shall give special consideration to the fire-extinguishing arrangements to be provided in spaces not fitted with fixed fire-extinguishing installations containing steam turbines which are separated from boiler rooms by watertight bulkheads.

9.4 Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific requirements for fire-extinguishing appliances are prescribed in par. 9.1 to 9.3 (9.9.1 to 9.9.3 of *the Code*), there shall be provided in, or adjacent to, that space a number of approved portable fire extinguishers or other means of fire extinction to the satisfaction of the Administration (*MODU Code*, 9.9).

10 PORTABLE FIRE EXTINGUISHERS IN ACCOMMODATION, SERVICE AND WORKING SPACES

10.1 Except for the supplemental arrangements provided in par. 10.2 (9.10.2 of *the Code*), portable fire extinguishers in accommodation spaces, service spaces, control stations, machinery spaces of category A, other machinery spaces, cargo spaces, weather deck and other spaces shall be provided in number and arrangement in accordance with the guidance provided by IMO* to the satisfaction of the Administration.

10.2 Table 9-3 contains supplemental recommendations for number and distribution of additional portable fire extinguishers on mobile offshore drilling units. Where the recommendations in table 9-3 differ from the guidance provided by IMO *, the recommendations of table 9-3 shall be followed. In all cases, the selection of the fire extinguishing medium shall be based on the fire hazard for the space protected. ** The classes of portable fire extinguishers in the table are only for reference (*MODU Code*, 9.10).

* Refer to the Unified Interpretation of SOLAS chapter II-2 on the Number and Arrangement of Portable Fire Extinguishers on Board Ships (MSC.1/Circ.1275).

** Refer to the Improved Guidelines for Marine Portable Fire Extinguishers, adopted by IMO by resolution A.951(23).

Table 9-3
Recommended number and distribution of additional portable extinguishers

Type of space/ place	Minimum number of extinguishers*
Space containing the controls for the main source of electrical power	1; and 1 additional extinguisher suitable for electrical fires when main switchboards are arranged in the space
Cranes: With electric motors/hydraulics	0
Cranes: With internal combustion engine	2 (1 in cab and 1 at exterior of engine compartment)
Drill floor	2 (1 at each exit)
Helidecks	In accordance with chapter 17 (sec. 9.17 of the Code)
Machinery spaces of category A	In accordance with chapter 9 (sec. 9.9 of the Code)
Machinery spaces of category A which are periodically unattended	At each entrance in accordance with chapter 8 (sec. 9.8 of the Code)**
Main switchboards	2 in the vicinity
Mud pits, mud processing areas	1 for each enclosed space (Travel distance to an extinguisher not to exceed 10 m for open space)
* Minimum size shall be in accordance with par. 3.1.1 of chapter 4 of the FSS Code.	
** A portable extinguisher provided for that space may be located outside near the entrance to that space. A portable fire extinguisher placed outside near the entrance to that space may also be considered as satisfying the requirements for the space in which it is located.	

11 FIRE DETECTION AND ALARM SYSTEM

11.1 General requirements

11.1.1 An automatic fire detection and alarm system shall be provided in all accommodation and service spaces. Accommodation spaces shall be fitted with smoke detectors.

11.1.2 Sufficient manual fire alarm stations shall be installed at suitable locations throughout the unit.

11.1.3 A fixed fire detection and fire alarm system shall be installed in:

- .1 periodically unattended machinery spaces; and
- .2 machinery spaces where:
 - 2.1 the installation of automatic and remote control system and equipment has been approved in lieu of continuous manning of the spaces, and
 - 2.2 the main propulsion and associated machinery, including the main sources of electrical power, are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room (MODU Code, 9.11).

11.1.4 Spaces having a fire risk, in principle, shall be provided with an automatic fire detection and alarm system (IACS UR D11.6.1.1/Rev.4/Corr.1).

11.1.5 In selecting the type of detectors, their following features shall be taken into account:

- .1 capability to detect fire at the incipient stage;
- .2 ability to avoid spurious alarm and trips; and
- .3 suitability to the located environment (IACS UR D11.6.1.2/ Rev.4/ Corr.1).

11.1.6 The fire detection main indicator board shall be at a manned control station and shall be clearly to indicate where fire has been detected (IACS UR D11.6.1.3/Rev.4/Corr.1).

11.2 Specific requirements

11.2.1 Machinery spaces

Fire detectors shall be fitted in normally unattended machinery spaces.

Detection systems using only thermal detectors, in general, shall not be permitted (IACS UR D11.6.2/Rev.4/Corr.1).

11.2.2 Accommodation and service spaces

An automatic fire detection and alarm system shall be provided in all accommodation and service spaces.

Accommodation space shall be fitted with smoke detectors.

Thermal detectors shall be fitted in galleys (IACS UR D11.6.3/Rev.4/Corr.1).

11.2.3 Electrical rooms and control stations

Smoke detectors shall be provided in all electrical rooms and control stations (IACS UR D11.6.4/Rev.4/Corr.1).

11.2.4 Drilling and mud processing areas

Flame or thermal detectors shall be installed in open drilling and/or mud processing areas.

Smoke detectors may be used in enclosed mud processing areas (IACS UR D11.6.5/Rev.4/Corr.1).

11.2.5 Manually operated alarm system

Sufficient manual fire alarm stations shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manually operated call point.

Measures shall be taken to prevent inadvertent operation of the manual call alarm system (IACS UR D11.6.6/Rev.4/Corr.1).

12 FLAMMABLE GAS DETECTION AND ALARM SYSTEM

12.1 General requirements

12.1.1 A fixed automatic gas detection and alarm system shall be provided to the satisfaction of the Administration so arranged as to monitor continuously all enclosed areas of the unit in which an accumulation of flammable gas may be expected to occur and capable of indicating at the main control point by aural and visual means the presence and location of an accumulation.

12.1.2 At least two portable gas monitoring devices shall be provided, each capable of accurately measuring a concentration of flammable gas (*MODU Code*, 9.12).

12.2 Specific requirements:**12.2.1 Areas for protection**

Fixed automatic combustible gas detection and alarm systems shall be provided for the following areas:

- .1 cellar deck;
- .2 drill floor;
- .3 ventilation intake of positive pressure driller's cabin;
- .4 mud pit area;
- .5 shale shaker area;
- .6 enclosed spaces containing the open components of mud circulation system from the bell nipple to the mud pits;
- .7 ventilation intakes of accommodation spaces;
- .8 ventilation intakes of enclosed machinery spaces contiguous to hazardous areas and containing internal combustion engines, boilers, or non-explosion proof electrical equipment;
- .9 air intakes to all combustion engines or machinery, including internal combustion engines, boilers, compressors or turbines, located outside of an enclosed machinery space;
- .10 at each access door to accommodation spaces;
- .11 near other openings, including emergency egress, of accommodation spaces, regardless if these openings are fitted with self-closing and gastight closing appliances (IACS UR D11.7.1/ Rev.4/Corr.1).

12.2.2 Areas where protection is not required

Fixed automatic combustible gas detection and alarm systems are not required:

- .1 near access doors to accommodation spaces where these form part of an air-lock which is provided with a gas detection and alarm system between the two doors of the air-lock;
- .2 near emergency egress doors which are fitted with a mechanism to prevent use other than in an emergency (e.g. doors fitted with security seals acting as a deterrent but easily breakable in a real emergency);
- .3 near other openings which are provided with closing appliances of non-opening type, e.g. bolted closed maintenance ways etc. (IACS UR D11.7.2/Rev.4/Corr.1).

12.2.3 Alarms

The gas detectors shall be connected to an audible and visual alarm system with indicators on the drill floor and in the main control station. The alarm system shall clearly indicate the location and concentration of the gas hazard. The combustible gas detectors shall alarm at not more than 25% and at 60% of the lower explosive limit (LEL) (IACS UR D11.7.3/Rev.4/Corr.1).

12.2.4 Portable combustible gas detectors

In addition to the fixed automatic gas detection system, two portable combustible gas detectors shall be provided on the unit (IACS UR D11.7.4/Rev.4/Corr.1).

13 HYDROGEN SULPHIDE DETECTION AND ALARM SYSTEM**13.1 Areas for protection**

A fixed automatic hydrogen sulphide gas detection and alarm system shall be provided to the satisfaction of the Administration so arranged as to monitor continuously:

- .1 drilling area;

- .2 mud processing area; and
- .3 well fluid test area,

of the unit and capable of giving audible and visual alarm at the main control room. If the alarm at the main control point is unanswered within 2 min, the toxic gas (hydrogen sulphide) alarm and the helideck status light under par. 13.5.26 of the *MODU Code* shall be automatically activated (*MODU Code*, 9.13) (IACS UR D11.8.1/Rev.4/Corr.1).

13.2 Alarms

The detectors shall be connected to an audible and visual alarm system with indicators in main control room. The system shall clearly indicate where gas has been detected.

Low level alarm set at 10 ppm and high level alarm set not higher than 300 ppm shall be designed. The high level alarm shall activate an evacuation alarm.

If the alarm at the main control point is unanswered within 2 min, the toxic gas (hydrogen sulphide) alarm and the helideck status light shall be automatically activated (IACS UR D11.8.2/Rev.4/Corr.1).

13.3 Portable hydrogen sulphide gas detectors

At least two portable hydrogen sulphide gas monitoring devices shall be provided on the unit (IACS UR D11.8.3/Rev.4/Corr.1).

13.4 Respiratory protection equipment for hydrogen sulphide

- .1 A self-contained breathing apparatus (SCBA) positive-pressure/pressure-demand breathing equipment with full-face piece and rated for a minimum of 30 minutes shall be provided for each person in working areas where hydrogen sulphide may be encountered, and each person in other areas shall be provided with a SCBA rated for a minimum of 15 minutes; or
- .2 A positive-pressure/pressure-demand air line breathing equipment coupled with a SCBA equipped low pressure warning alarm and rated for a minimum of 15 minutes shall be provided for each person on board the unit.

Breathing air supply line stations shall be provided at least in the following areas:

- .2.1 living quarter;
- .2.2 muster/evacuation area;
- .2.3 drilling areas;
- .2.4 mud processing areas; and
- .2.5 other working areas. (IACS UR D11.9/Rev.4/Corr.1)

14 FIRE-FIGHTERS' OUTFITS

14.1 At least two fire-fighters' outfits complying with the relevant requirements of the *FSS Code* shall be provided, each with portable instruments for measuring oxygen and flammable vapour concentrations acceptable to the Administration.

14.2 Two spare charges shall be provided for each required breathing apparatus. Units that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus.

14.3 The fire-fighters' outfits shall be kept ready for use in an easily accessible location that is permanently and clearly marked. They shall be stored in two or more widely separated locations (*MODU Code*, 9.14).

15 RECHARGING OF AIR CYLINDERS (FOR BREATHING)

15.1 The apparatus for recharging air cylinders, if provided, shall have its power supplied from the emergency supply or be independently diesel-powered, or be so constructed or equipped that the air cylinders may be used immediately after recharging.

15.2 The apparatus shall be suitably located in a sheltered space above main deck level on the unit.

15.3 Intakes for air compressors shall draw from a source of clean air.

15.4 The air shall be filtered after compression to eliminate compressor oil contamination.

15.5 The recharging capacity shall meet the requirements of *SOLAS* regulation II-2/10.10.2.6.

15.6 The equipment and its installation shall be to the satisfaction of the Administration (*MODU Code*, 9.15).

16 ARRANGEMENTS IN MACHINERY AND WORKING SPACES

16.1 Means shall be provided for stopping ventilating fans serving machinery and working spaces and for closing all doorways, ventilators, annular spaces around funnels and other openings to such spaces. These means shall be capable of being operated from outside such spaces in case of fire.

16.2 Machinery driving forced and induced draught fans, electric motor pressurization fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they may be stopped in the event of a fire arising in the space in which they are located.

16.3 Every oil fuel suction pipe from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve capable of being closed from outside the space concerned in the event of a fire arising in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel, valves on the tanks shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipeline or lines outside the tunnel or tunnels. (*MODU Code*, 9.16)

17 REQUIREMENTS FOR HELICOPTER FACILITIES

17.1 This section provides additional measures in order to address the fire safety objectives for units fitted with facilities for helicopters and meets the following functional requirements:

- .1 helideck structure shall be adequate to protect the unit from the fire hazards associated with helicopter operations;
- .2 fire-fighting appliances shall be provided to adequately protect the unit from the fire hazards associated with helicopter operations;
- .3 refuelling facilities and operations shall provide the necessary measures to protect the unit from the fire hazards associated with helicopter operations; and
- .4 helicopter facility operation manuals, which may be included in the operation manual under chapter 14 of *MODU Code*, and training shall be provided.

17.2 The construction of the helidecks shall be of steel or other equivalent materials. If the helideck forms the deckhead of a deckhouse or superstructure, it shall be insulated to "A-60" class standard. If the Administration permits aluminium or other low melting point metal construction that is not made equivalent to steel, the following requirements shall be satisfied:

- .1 if the helideck is cantilevered over the side of the unit, after each fire that may have an effect on the structural integrity of the helideck or its supporting structures, the helideck shall undergo a structural analysis to determine its suitability for further use; and
 - .2 if the helideck is located above the unit's deckhouse or similar structure, the following conditions shall be satisfied:
 - .2.1 the deckhouse top and bulkheads under the helideck shall have no openings;
 - .2.2 windows under the helideck shall be provided with steel shutters; and
 - .2.3 after each fire on the helideck or supporting structure the helideck shall undergo a structural analysis to determine its suitability for further use.
- 17.3** A helideck shall be provided with both a main and an emergency means of escape and access for fire-fighting and rescue personnel. These shall be located as far apart from each other as is practicable and preferably on opposite sides of the helideck.
- 17.4** In close proximity to the helideck, the following fire-fighting appliances shall be provided and stored near the means of access to that helideck:
- .1 at least two dry powder extinguishers having a total capacity of not less than 45 kg but not less than 9 kg each;
 - .2 carbon dioxide extinguishers of a total capacity of not less than 18 kg or equivalent;
 - .3 a foam application system consisting of monitors or foam-making branch pipes capable of delivering foam to all parts of the helideck in all weather conditions in which the helideck is intended to be available for helicopter operations. The minimum capacity of the foam production system will depend upon the size of the area to be protected, the foam application rate, the discharge rates of installed equipment and the expected duration of application:
 - .3.1 a minimum application rate of 6 l/m² within a circle having a diameter equal to the *D*-value;
 - .3.2 a minimum of 5 min discharge capability shall be provided;
 - .3.3 foam delivery at the minimum application rate shall start within 30 s of system activation;
 - .4 the principal agent shall be suitable for use with salt water and conform to performance standards not inferior to those acceptable to the IMO; *
- * Refer to the *International Civil Aviation Organization Airport Services Manual, part 1, Rescue and Fire Fighting, chapter 8, Extinguishing Agent Characteristics, paragraph 8.1.5, Foam Specifications table 8-1, level 'B'*.
- .5 at least two nozzles of an approved dual-purpose type (jet/spray) and hoses sufficient to reach any part of the helideck;
 - .6 in lieu of the requirements of par. 17.4.3 to 17.4.5 (9.17.4.3 to 9.17.4.5 of the *MODU Code*), on units constructed on or after 1 January 2020, foam fire-fighting appliances complying with the provisions of the *FSS Code*;
 - .7 in addition to the provisions of chapter 14 (sec. 9.14 of the *MODU Code*), two fire-fighter's outfits; and
 - .8 at least the following equipment shall be stored in a manner that provides for immediate use and protection from the elements:
 - .8.1 adjustable wrench;
 - .8.2 blanket, fire-resistant;
 - .8.3 cutters, bolt, 600 mm;
 - .8.4 hook, grab or salving;
 - .8.5 hacksaw, heavy duty complete with six spare blades;

- .8.6 ladder;
 - .8.7 lift line 5 mm diameter and 30 m in length;
 - .8.8 pliers, side-cutting;
 - .8.9 set of assorted screwdrivers;
 - .8.10 harness knife complete with sheath; and
 - .8.11 crowbar.
- 17.5** Drainage facilities in way of helidecks shall be:
- .1 constructed of steel or other arrangements providing equivalent fire safety;
 - .2 lead directly overboard independent of any other system; and
 - .3 designed so that drainage does not fall onto any part of the unit.
- 17.6** Where the unit has helicopter refuelling, the following requirements shall be complied with:
- .1 a designated area shall be provided for the storage of fuel tanks which shall be:
 - .1.1 as remote as is practicable from accommodation spaces, escape routes and embarkation stations; and
 - .1.2 isolated from areas containing a source of vapour ignition;
 - .2 the fuel storage area shall be provided with arrangements whereby fuel spillage may be collected and drained to a safe location;
 - .3 tanks and associated equipment shall be protected against physical damage and from a fire in an adjacent space or area;
 - .4 where portable fuel storage tanks are used, special attention shall be given to:
 - .4.1 design of the tank for its intended purpose;
 - .4.2 mounting and securing arrangements;
 - .4.3 electric bonding; and
 - .4.4 inspection procedures;
 - .5 storage tank fuel pumps shall be provided with means which permit shutdown from a safe remote location in the event of a fire. Where a gravity-fuelling system is installed, equivalent closing arrangements shall be provided to isolate the fuel source;
 - .6 the fuel pumping unit shall be connected to one tank at a time. The piping between the tank and the pumping unit shall be of steel or equivalent material, as short as possible, and protected against damage;
 - .7 electrical fuel pumping units and associated control equipment shall be of a type suitable for the location and potential hazards;
 - .8 fuel pumping units shall incorporate a device which will prevent over-pressurization of the delivery or filling hose;
 - .9 the equipment used in refuelling operations shall be electrically bonded; and
 - .10 "NO SMOKING" signs shall be displayed at appropriate locations. (MODU Code, 9.17)

17.7 Equivalent requirements for fire-fighting equipment

Where areas of a unit are designated for helicopter facilities, the fire-fighting equipment as given in par.17.7.1 and 17.7.2 (D11.4.2 and D11.4.3) shall be provided and so arranged as to adequately protect both the helicopter deck and fuel storage areas (IACS UR D11.4.1/Rev.4/Corr.1).

17.7.1 Portable fire extinguishers

- .1 Primary extinguishers: dry powder extinguishers of a total capacity of not less than 45 kg.
- .2 Back-up extinguishers: CO₂ extinguishers of a total capacity of not less than 18 kg or equivalent, one of these extinguishers being so equipped as to enable it to reach the engine area of any helicopter using the deck. The back-up extinguishers shall be located so that they would not be vulnerable to the same damage as the primary extinguishers (IACS UR D11.4.2/ Rev.4/ Corr.1).

17.7.2 Fixed fire- fighting systems

- .1 Fire water system: at least two approved nozzles of jet/spray type and hoses sufficient in length to reach any part of the helicopter deck.
- .2 Fixed foam system: a suitable foam application system consisting of monitors or hose streams or both shall be installed. The system shall be capable of delivering foam solution at a rate of not less than 6 l/min·m² (4.1 l/min·m² for Aqueous Film Forming Foam or Film-Forming Fluoroprotein Foam) for at least 5 minutes (IACS UR D11.4.3/Rev.4/Corr.1).

18 STORAGE OF GAS CYLINDERS (FOR WELDING)

18.1 Where a welding gas system consisting of more than one cylinder of oxygen and more than one cylinder of acetylene is to be installed on a unit, the system and cylinders shall be arranged in accordance with the following:

- .1 permanent piping systems for oxyacetylene systems shall be designed having due regard to standards and codes of practice to the satisfaction of the Administration.
- .2 where two or more cylinders of each gas are intended to be carried in enclosed spaces, separate dedicated storage rooms shall be provided for each gas.
- .3 storage rooms shall be constructed of steel, and be well ventilated and accessible from the open deck.
- .4 provision shall be made for the expeditious removal of cylinders in the event of fire.
- .5 “NO SMOKING” signs shall be displayed at the gas cylinder storage rooms.
- .6 where cylinders are stowed in open locations means shall be provided to:
 - .6.1 protect cylinders and associated piping from physical damage;
 - .6.2 minimize exposure to hydrocarbons; and
 - .6.3 ensure suitable drainage.

18.2 Fire-extinguishing arrangements for the protection of areas or spaces where oxygen and acetylene cylinders are stored shall be to the satisfaction of the Administration (MODU Code, 9.18).

19 FIRE CONTROL PLAN

19.1 A fire control plan complying with SOLAS regulation II-2/15.2.4 shall be permanently exhibited on the unit (MODU Code, 9.19).

19.2 Fire control plans are to be submitted for acceptance by Administration, on which the following, as a minimum, shall be clearly shown:

- .1 locations of fire control stations;
- .2 various fire sections enclosed by various classes of fire divisions;
- .3 arrangement of fire detectors and manual fire alarm stations;
- .4 arrangement of combustible gas detectors;
- .5 arrangement of hydrogen sulphide gas detectors;
- .6 locations of respiratory protection equipment for hydrogen sulphide;
- .7 general alarm actuating positions;
- .8 arrangement of various fire-extinguishing appliances;
- .9 locations of fighter’s outfits;
- .10 location of helicopter crash kit;
- .11 arrangement of water spray nozzles and sprinklers (if fitted);
- .12 locations of emergency shutdown (such as oil fuel source shutdown, engine shutdown, etc.) stations;

- .13 the ventilating system including fire dampers positions, ventilating fans control positions with indication of identification numbers of ventilating fans serving each section;
- .14 arrangement of fire/watertight doors and their remote control positions;
- .15 blowout preventer control positions;
- .16 escape route and means of access to different compartments, decks, etc.;
- .17 locations of Emergency Escape Breathing Devices (EEBD); and
- .18 arrangement of emergency muster stations and life-saving appliances (IACS UR D11.1.2/Rev.4/Corr.1).

19.3 The graphic symbols used on the Fire Control Plan shall be in accordance with the symbols given in resolution A.952(23) and resolution A.1116(30), used on ships, and all inscriptions shall be in the official language of the Administration.

20 OPERATIONAL READINESS AND MAINTENANCE

20.1 The following functional requirements shall be met during the operation of the unit:

- .1 gas detection systems, fire protection systems and fire-fighting systems and appliances shall be maintained ready for use; and
- .2 gas detection systems, fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.

20.2 At all times while the unit is in service, the requirements of par. 20.1 (9.20.1 of the Code) shall be complied with. A unit is not in service when:

- .1 it is in for repairs or lay up (either at anchor or in port) or in dry-dock;
- .2 it is declared not in service by the owner or the owner's representative.

20.3 Operational readiness

- .1 The following gas detection and fire protection systems shall be kept in good order so as to ensure their intended performance if a fire occurs:
 - .1.1 structural fire protection including fire-resisting divisions and protection of openings and penetrations in these divisions;
 - .1.2 fire detection and fire alarm systems;
 - .1.3 gas detection and alarm systems; and
 - .1.4 means of escape systems and appliances.
- .2 Fire-fighting systems and appliances and portable gas detection systems shall be kept in good working order and readily available for immediate use. Portable extinguishers which have been discharged shall be immediately recharged or replaced with an equivalent unit.

20.4 Maintenance, testing and inspections

- .1 Maintenance, testing and inspections shall be carried out based on the guidelines developed by IMO* and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances.

* Refer to the Publication 29/I, prepared on the basis of IMO Circulars.

- .2 The maintenance plan shall be kept on board the unit and be available for inspection whenever required by the Administration.
- .3 The maintenance plan shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed:

- .3.1 fire mains, fire pumps and hydrants including hoses, nozzles and international shore connections;
 - .3.2 fixed fire detection and fire alarm systems;
 - .3.3 fixed fire-extinguishing systems and other fire-extinguishing appliances;
 - .3.4 automatic sprinkler, fire detection and fire alarm systems;
 - .3.5 ventilation systems including fire and smoke dampers, fans and their controls;
 - .3.6 emergency shut down of fuel supply;
 - .3.7 fire doors including their controls;
 - .3.8 general emergency alarm systems;
 - .3.9 emergency escape breathing devices (EEBD);
 - .3.10 portable fire extinguishers including spare charges or spare extinguishers;
 - .3.11 portable hydrogen sulphide gas detection monitoring devices;
 - .3.12 portable flammable gas and oxygen monitoring devices;
 - .3.13 gas detection and alarm systems; and
 - .3.14 fire-fighter's outfits.
- .4 The maintenance programme may be computer-based (*MODU Code*, 9.20).

21 SPECIAL MEASURES TO ENHANCE SAFETY

21.1 Atmosphere testing instrument for enclosed spaces

21.1.1 Each unit shall carry an appropriate portable atmosphere testing instrument or instruments *. As a minimum, these shall be capable of measuring concentrations of oxygen, flammable gases or vapours, hydrogen sulphide and carbon monoxide prior to entry into enclosed spaces **. Instruments carried under other requirements may satisfy this regulation. Suitable means shall be provided for the calibration of all such instruments.

* Refer to the Guidelines to facilitate the selection of portable atmosphere testing instruments for enclosed spaces as required by SOLAS regulation XI-1/7(MSC.1/Circ.1477).

** Refer to the Revised recommendations for entering enclosed spaces aboard ships (resolution A.1050(27)).

21.1.2 Such instruments shall be in addition to those provided with the unit's firemen's outfits (*MODU Code*, 15).

22 ALARMS AND PUBLIC ADDRESS

22.1 General alarms

22.1.1 A general alarm system is to be provided and so installed as to be clearly perceptible in all parts of the unit. Alarm signal devices are to be provided which will produce a distinctive and strong note.

The signals used should be limited to: general emergency, toxic gas (hydrogen sulphide), combustible gas, fire alarm and abandon unit signals.

The signals given over the general alarm system should be supplemented by instructions over the public address system.

22.1.2 At least in the following spaces general alarm is to be capable of being operated:

- .1 Main control station;
- .2 Drilling console;
- .3 Navigating bridge (if any); and
- .4 Fire control station (if any) (IACS UR D11.5.1/Rev.4/Corr.1).

22.2 Mud system level alarms

A suitable audible and visual alarm to indicate significant increase or decrease in the level of the contents of the mud pit is to be provided at the control station for drilling operations and at the mud pit. Equivalent means to indicate possible abnormal conditions in the drilling system may be considered by the Society (IACS UR D11.5.2/Rev.4/Corr.1).

22.3 Ventilation system alarm

Alarms shall be provided for abnormal conditions of ventilation in hazardous areas, as specified in sub-chapter 3.3 of *Part VI* (See D8.2.4) (IACS UR D11.5.3/Rev.4/Corr.1).

22.4 Public address

22.4.1 The public address system is to be a loudspeaker installation enabling the broadcast of messages into all spaces where personnel are normally present and muster stations. It is to allow for the broadcast of messages from navigation bridge, central control room, emergency response centre, engine control room, ballast control station, jacking control station and drilling console. It is to be installed with regard to acoustically marginal conditions and not require any action from the addressee. It is to be protected against unauthorized use.

22.4.2 The minimum sound pressure levels for broadcasting emergency announcements are to be:

- .1 in interior spaces 75dB(A) and at least 20dB(A) above the speech interference level; and
- .2 in exterior spaces 80dB(A) and at least 15dB(A) above the speech interference level (IACS UR D11.5.4/Rev.4/Corr.1).

23 PERIODICALLY UNATTENDED MACHINERY SPACES

Requirements on fire safety for periodically unattended machinery spaces – see Chapter 4 of *Part IV*, of the *Rules*.

List of reference IMO documents in this Part V

IMO Assembly Resolutions

1. A.951(23): Improved Guidelines for Marine Portable Fire Extinguishers.
2. A.952(23): Graphical Symbols for Shipboard Fire Control Plans.
3. A.1021(26): Code on Alerts and Indicators.
4. A.1050(27): Revised recommendations for entering enclosed spaces aboard ships.
5. A.1116(30): Escape Route Signs and Equipment Location Markings.

MSC Circulars

1. MSC.1/Circ.1275: Unified Interpretation of SOLAS chapter II-2 on the Number and Arrangement of Portable Fire Extinguishers on Board Ships.
2. MSC.1/Circ.1477: Guidelines to facilitate the selection of portable atmosphere testing instruments for enclosed spaces as required by SOLAS regulation XI-1/7.

List of IACS resolutions implemented to this Part V

Unified Requirements (UR)

D11/Rev.4/Corr.1 Safety features