

RULES

FOR THE CLASSIFICATION AND CONSTRUCTION OF MOBILE OFFSHORE DRILLING UNITS

PART VIII

SYSTEMS AND PIPING

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RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF MOBILE OFFSHORE DRILLING UNITS

Rules for the Classification and Construction of Mobile Offshore Drilling Units (the MODU Rules) of Russian Maritime Register of Shipping (RS, the Register) have been approved in accordance with the established approval procedure and come into force on 1 September 2023.

The present Rules are based on the latest version of the Rules for the Classification, Construction and Equipment of Mobile Offshore Drilling Units and Fixed Offshore Platforms, 2022, taking into account the amendments and additions developed immediately before publication.

The procedural requirements, unified requirements, unified interpretations and recommendations of the International Association of Classification Societies (IACS) and the relevant resolutions of the International Maritime Organization (IMO) have been taken into consideration.

The Rules set down specific requirements for MODU, consider the recommendations of the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (2009 MODU Code) (IMO resolution A.1023(26), as amended) and supplement the Rules for the Classification and Construction of Sea-Going Ships and the Rules for the Equipment of Sea-Going Ships.

The Rules are published in the following parts:

Part I "Classification";

Part II "Hull";

Part III "Equipment, Arrangements and Outfit";

Part IV "Stability";

Part V "Subdivision";

Part VI "Fire Protection";

Part VII "Machinery Installations and Machinery";

Part VIII "Systems and Piping";

Part IX "Boilers, Heat Exchangers and Pressure Vessels";

Part X "Electrical Equipment";

Part XI "Refrigerating Plants";

Part XII "Materials";

Part XIII "Welding";

Part XIV "Automation";

Part XV "Safety Assessment";

Part XVI "Signal Means";

Part XVII "Life-Saving Appliances";

Part XVIII "Radio Equipment";

Part XIX "Navigational Equipment";

Part XX "Equipment for Prevention of Pollution".

REVISION HISTORY

(purely editorial amendments are not included in the Revision History)

For this version, there are no amendments to be included in the Revision History.

1 GENERAL

1.1 APPLICATION

1.1.1 The requirements of this Part of the Rules for the Classification and Construction of Mobile Offshore Drilling Units¹ cover the following piping systems.

1.1.1.1 General purpose piping systems:

bilge system;
ballast system;
air, overflow and sounding pipes;
ventilation and air conditioning system of accommodation and service spaces.

1.1.1.2 Machinery piping systems:

fuel oil system;
lubricating oil system;
cooling water system;
compressed air system;
exhaust gas system;
feed water system;
condensate system;
steam and blow-off piping systems;
thermal oil systems;
ventilation system of machinery spaces, accumulator battery rooms and boxes.

1.1.1.3 Special systems:

ventilation system of hazardous spaces;
sea water supply system of self-elevating MODU;
hydraulic jacking system of MODU;
fuel system for helicopters;
emergency mud dumping system;
process systems, systems incorporated into the MODU process system;
system for gathering of well fluids,
system for well fluid treatment,
flare system and gas withdrawal system,
pressure release and gas withdrawal system,
system for treatment, gathering and utilization of processing wastes including produced waters,
system for gas dehydration,
system for gas compression,
systems for water injection, gas injection and gas-lift system,
system for storage of well fluids,
system for transportation of well fluids,
auxiliary systems and equipment.

As applied to the process systems, the requirements of this Part shall be taken into account to the extent, which is indispensable for ensuring watertight integrity, explosion and fire safety of the unit.

¹ Hereinafter referred to as "the MODU Rules".

1.2 DEFINITIONS

1.2.1 For the purposes of this Part the following definitions have been adopted.

Pipeline is a combination of pipes, fittings, any internal and external linings, coatings, insulation, fastening elements and components for protection of pipes, intended for conveying of liquid, gaseous and compound media, as well as for transmission of pressure and sound waves.

Piping system is a combination of pipelines, machinery, apparatus, devices, appliances and reservoirs intended for performance of certain functions providing units' operation.

Valves are stop, safety and regulating devices, intended for motion control, distribution and regulation of consumption and other parameters of the conveying medium by means of full or partial opening or closing of flow section.

1.3 SCOPE OF TECHNICAL SUPERVISION

1.3.1 General provisions relating to the procedure of technical supervision during construction and surveys, as well as requirements for the scope of technical documentation to be submitted for review and approval to the Register shall comply with the General Regulations for the Classification and Other Activity.

1.3.2 The technical documentation to be submitted to the Register for review and approval shall also include schematic diagrams of the process systems conveying explosive and flammable media.

1.4 PROTECTION AND INSULATION OF PIPING

1.4.1 Pipes shall be protected against corrosion and against excessive pressure, as well as insulated with due regard for the requirements of 1.4, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships¹. Pipes used for the process purposes shall be protected against corrosion and insulated according to 1.3, Part V "Systems and Piping" of the Rules for the Oil-and-Gas Equipment of Floating Offshore Oil-and-Gas Product Units, Mobile Offshore Drilling Units and Fixed Offshore Platforms².

1.4.2 In the pipes of water fire extinguishing systems having no other purpose than fire extinguishing (water fire main (not used for other purposes), pressure water-spraying, drenching, water-screen, foam fire extinguishing, sprinkler), permissible water speed is up to 6 m/s.

¹ Hereinafter referred to as "the Rules for the Classification".

² Hereinafter referred to as "the OGE Rules".

1.5 WELDING AND NON-DESTRUCTIVE TESTING OF WELDS

1.5.1 Welding and non-destructive testing of welds shall be effected in compliance with the requirements of 1.5, Part VIII "Systems and Piping" of the Rules for the Classification.

2 GENERAL REQUIREMENTS FOR PIPING SYSTEMS

2.1 METAL PIPING

2.1.1 The requirements for materials used for manufacturing of pipes and fittings, permissible radii of pipe bends and heat treatment after bending, permissible pipe wall thicknesses and pipe joints are specified in 1.3.2, 1.3.3 of Section 1 and in Section 2, Part VIII "Systems and Piping" of the Rules for the Classification, as well as in 2.2, Part V "Systems and Piping" of the OGE Rules.

2.2 PLASTIC PIPING

2.2.1 Plastic pipes used shall be manufactured, assembled and tested in compliance with the requirements of Section 3, Part VIII "Systems and Piping" of the Rules for the Classification.

2.3 HOSES

2.3.1 Hoses used on MODU shall comply with the requirements of Section 6, Part VIII "Systems and Piping" of the Rules for the Classification.

2.4 VALVES

2.4.1 Construction of the manually and remotely operated valves, their marking, arrangement and installation, construction of sea chests and ice boxes, bottom and side valves, openings in shell plating shall comply with the requirements of Section 4, Part VIII "Systems and Piping" of the Rules for the Classification. The pipeline fittings of the process system shall comply with the requirements in 2.4, Part V "Systems and Piping" of the OGE Rules.

2.4.2 Where a system is equipped with remote-controlled power actuated valves, means shall be also provided to operate the valves manually.

2.4.3 Sea inlet and discharge openings in spaces located below the waterline shall be provided with remote-controlled valves operable from a position outside these spaces.

Where remote operation is provided by power actuated valves for sea inlets and discharges for operation of the MODU propulsion and power generating machinery, a failure in the power supply of the control system shall not result in opening of closed valves or closing of open valves.

Use of bilge alarms instead of remote control of the valves may be only permitted for self-elevating MODU and semi-submersible MODU.

2.5 PIPING LAYING

2.5.1 Piping laying through watertight and fire-resisting divisions, in tanks, in the vicinity of electrical and radio equipment, in unattended machinery spaces, as well as in other spaces shall be effected with due regard for the requirements of Section 5, Part VIII "Systems and Piping" of the Rules for the Classification.

2.5.2 Pipes conveying non-hazardous media shall be separated from pipes, which may contain explosive and flammable media.

Cross-connection may be permitted by the Register in the event that measures are taken to prevent possible fouling of pipes containing non-hazardous medium.

2.5.3 Where pipelines or vent ducts of MODU serve more than one compartment or are located in the region of assumed flooding (refer to 2.4, Part V "Subdivision"), structural precautions shall be taken to prevent progressive flooding of other compartments through these piping systems in case of damage.

For this purpose the pipelines and vent ducts shall be fitted with watertight shut-off devices to be installed on watertight bulkheads and decks and capable of being remotely operated from the upper deck.

2.5.4 On semi-submersible MODU, each side valve located below the waterline shall be remotely operated from the upper deck. Same measures shall be taken on MODU of other types in cases where the said valves are located in rarely visited spaces not fitted with a high bilge water level alarm.

2.6 TESTING OF PIPING SYSTEMS

2.6.1 The requirements for tests of the piping and fittings are given in Section 21, Part VIII "Systems and Piping" of the Rules for the Classification.

3 REQUIREMENTS FOR PIPING SYSTEMS DEPENDING ON THEIR PURPOSE

3.1 GENERAL PURPOSE PIPING SYSTEMS

3.1.1 Bilge system.

3.1.1.1 Unless otherwise specified, the applicable requirements of Section 7, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.1.1.2 Watertight compartments and all the compartments below bulkhead deck, containing equipment essential for operation and safety, shall have a permanently installed bilge or drainage system.

The system shall be capable of draining the compartments effectively under all practical conditions, whether the unit is upright or inclined, as specified in 2.5, Part V "Subdivision".

3.1.1.3 Dry compartments, which are adjacent to the sea or adjacent to the tanks containing liquids, and void spaces, through which pipes conveying liquids pass, shall have permanently installed bilge system or portable means of dewatering.

When using the latter, two portable bilge pumps shall be provided, located in an easily accessible place.

3.1.1.4 All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions, which are readily accessible under ordinary circumstances.

Where such valves are located in normally unmanned spaces below the assigned load line and not provided with high bilge water level alarms, they shall be remotely operable from outside the spaces in addition to the local control.

3.1.1.5 Means shall be provided to signal the presence of water in compartments, which are adjacent to the sea or adjacent to the tanks containing liquids, as well as in dry compartments, through which pipes conveying liquids pass.

3.1.1.6 The permanently installed bilge system mentioned in [3.1.1.2](#) shall be served by at least two independently driven power pumps or similar equipment.

Independent ballast and sanitary pumps of adequate capacity may be accepted as bilge pumps.

3.1.1.7 The cross-sectional area of the bilge main shall be not less than the total cross-sectional area of two largest branch suction.

The internal diameter d , in mm, of branch suction from each compartment being emptied shall be not less than that determined by the formula, to the nearest standard dimension

$$d = 2,15 \sqrt{A} + 25 \quad (3.1.1.7)$$

where A = the wetted surface, in m^2 , of the compartment, excluding stiffening members, when the compartment is half filled with water. In any case, the internal diameter of any branch suction shall not be less than 50 mm.

3.1.1.8 The capacity of each bilge pump shall be sufficiently large to give the water a speed of not less than 2 m/s through the bilge main.

Where more than two pumps are connected to the bilge main, their total capacity shall be not less than specified above.

3.1.1.9 On semi-submersible and submersible MODU, at least one of the bilge pumps shall be of submersible type with power source located on the drill floor of the MODU.

3.1.1.10 On self-elevating MODU and drilling ships, the bilge pumps shall be arranged in separate watertight compartments or shall be of submersible type with power source located on the drill floor of the MODU.

3.1.1.11 On each MODU, the valve chests and control fittings shall be arranged so that in the event of flooding of one bilge pump the other pump is capable of draining any flooded compartment.

3.1.1.12 On semi-submersible and submersible MODU, the bilge system shall be capable of being operated from permanently manned locations.

3.1.1.13 The machinery spaces of MODU with machinery, necessary for propulsion or positioning, as well as the normally unmanned pump rooms in lower hulls of stability columns shall be provided with two independent systems for high bilge water level indication.

3.1.1.14 On semi-submersible and submersible MODU, the chain lockers which, if flooded, could substantially affect the stability of the unit shall be provided with remote means to detect flooding and with permanently installed means of dewatering.

Remote indication of flooding shall be provided at the ballast control station.

Means shall be also provided to remove dirt and sludge from the bilge or drainage system.

3.1.1.15 Hazardous and non-hazardous spaces shall have separate bilge or drainage systems.

3.1.1.16 The bilge system is not permitted to be combined with the waste water system of accommodation quarters.

3.1.1.17 Unattended machinery spaces located below the waterline shall be provided with a high bilge water level alarm which activates visual and audible signal in the main machinery control room.

3.1.2 Ballast system.

3.1.2.1 Unless otherwise specified, the applicable requirements of Section 8, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.1.2.2 The ballast system shall be served by not less than two independently driven ballast pumps.

The pumps provided need not be dedicated ballast pumps, but shall be readily available for such use at all times.

A controlled gravity ballasting may be permitted.

3.1.2.3 The arrangement of suction shall be such that any ballast tank can be deballasted in all positions of MODU possible during operation.

3.1.2.4 Safeguards against accidental opening of suction valves in the operating or transit conditions of MODU shall be provided.

3.1.2.5 Requirements for column stabilized MODU.

3.1.2.5.1 The system shall be capable of pumping out any ballast tank by at least two power-driven pumps so arranged that tanks can be drained in any operating or transit conditions.

The ballast pumps shall be of self-priming type or be provided with a separate priming system.

3.1.2.5.2 The system shall be capable of raising the unit, starting from a level trim condition at deepest normal operating draft, to the severe storm draft, or a greater distance specified by the Register, within not more than 3 h.

Each ballast pump and the ballast control system shall be arranged with electrical power supply from the main and emergency sources of power.

3.1.2.5.3 The ballast system shall be arranged so as to prevent inadvertent transfer of ballast water from one tank to another.

Transfer of the ballast water from one tank to another through a single valve is not permitted except when such a transfer does not adversely affect stability.

3.1.2.5.4 The ballast system shall be arranged so that even with any one pump inoperable, it is capable of restoring the unit to a level trim condition and draft acceptable with respect to stability, when subject to the damage conditions specified in Section 2, Part V "Subdivision".

3.1.2.5.5 Remote means to operate and monitor the ballast pumps, ballast tank valves and sea chests, as well as indication of ballast valve position shall comply with the requirements of 9.3, Part XIV "Automation".

3.1.2.5.6 All ballast pumps and valves shall be fitted with independent local control. The independent local control of each ballast pump and of its associated ballast tank valves shall be in the same location.

3.1.2.5.7 The control and indicating systems mentioned in [3.1.2.5.5](#) shall function independently of one another or have sufficient redundancy, such that a failure of one of the system does not jeopardize the operation of the other systems.

3.1.2.5.8 Each power-actuated valve shall fall to the closed position upon loss of control power. Upon reactivation of control power, each such valve shall remain closed until the ballast control operator assumes control of the reactivated system.

In case where the position of the valve has no effect on the safety of the unit, this requirement may not apply.

3.1.2.5.9 The tank level indicating system mentioned in [3.1.2.5.5](#) shall provide means to:

.1 indicate liquid levels in all ballast tanks. Secondary means of determining levels in ballast tanks, which may be sounding pipes, may be provided. Tank level sensors shall not be situated in tank suction lines;

.2 indicate liquid levels in other liquid storage tanks, such as fuel oil tanks, fresh water tanks, drilling water tanks, etc., the filling or emptying of which could affect the stability of the unit. Tank level sensors shall not be situated in the tank suction lines.

3.1.2.5.10 Indication of ballast valve position shall be provided at each location from which the valves shall be controlled. The indicators shall rely on movement of the valve spindle.

3.1.2.5.11 Means shall be provided at the central ballast control station to isolate or disconnect the ballast pump control and ballast valve control systems from their sources of electrical, pneumatic or hydraulic power.

3.1.3 Air, overflow and sounding piping.

3.1.3.1 Air, overflow and sounding piping shall be arranged with due regard for the applicable requirements of Section 10, Part VIII "Systems and Piping" of the Rules for the Classification, unless otherwise specified.

3.1.3.2 Upper ends of air and overflow pipes shall be located having regard to the damage stability and location of damage waterline.

Air and overflow pipes which could course progressive flooding shall be avoided.

3.1.3.3 If the end of air and overflow pipes become immersed in case the MODU in damaged condition is inclined to an angle not exceeding 5° with respect to damage waterline, such pipes shall be fitted with automatic means of closing complying with the requirements of 10.1.8, Part VIII "Systems and Piping" of the Rules for the Classification.

3.1.3.4 The ends of air pipes of fuel and lubricating oil tanks shall be led to non-hazardous areas.

3.1.3.5 The height of air pipes on self-elevating MODU from the deck to the liquid level in the vent shall be not less than 380 mm.

3.1.3.6 If the overflows from several integral tanks situated in different watertight compartments are combined into a common header, such header shall be arranged above the deepest immersion line of the MODU.

3.1.3.7 The height of air pipes shall be chosen having regard to the permissible design pressure for the tank.

3.1.3.8 All the tanks shall be provided with individual sounding pipes or remote sounding arrangements which design is approved by the Register.

Where a sounding pipe does not exceed 20 m in length, the minimum internal diameter shall be equal to 38 mm. For pipes of greater length, the minimum internal diameter shall be increased up to 50 mm.

3.1.3.9 For the tanks, which are not accessible, the remote level indicating system shall be supplemented with sounding pipes.

3.1.3.10 Dry compartments adjacent to the sea or tanks containing liquids and dry compartments through which pipes conveying liquids pass shall be fitted with separate sounding pipes, approved tank liquid level indicating apparatus or means to detect if the compartments contain liquids.

3.1.4 Ventilation and air conditioning system of accommodation and service spaces.

3.1.4.1 The ventilation and air conditioning system of accommodation and service spaces on MODU shall be arranged with due regard for the requirements of 12.1.1 — 12.1.7 and the applicable requirements of 12.2, Part VIII "Systems and Piping" of the Rules for the Classification, unless otherwise specified.

3.1.4.2 Ventilation system of non-hazardous spaces shall be separate from that of dangerous spaces. Attention shall be given to the relative positions of the inlets and outlets of the ventilation system to minimize the risk of mutual fouling.

Air inlets of ventilation ducts shall be arranged outside the dangerous areas and located as high and as remote therefrom as practicable.

3.2 MACHINERY PIPING SYSTEMS

3.2.1 Fuel oil system.

3.2.1.1 Unless otherwise specified, the applicable requirements of Section 13, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2.1.2 The fuel pipelines shall be laid through non-hazardous spaces.

In general, the fuel pipes shall not be laid on working flats and in such locations where they can be subject to damage.

In exceptional cases, arrangement of fuel pipes in the above-mentioned areas is permitted, provided that reliable protection from mechanical damage is ensured.

3.2.1.3 The fuel tanks shall be separated from dangerous spaces by cofferdams. They shall not be arranged in dangerous areas.

3.2.1.4 The capacity of the fuel tank for emergency diesel generator shall meet the requirements of 9.3.1, Part X "Electrical Equipment".

3.2.1.5 Bunkering shall be carried out through filling pipes led to above the open decks or platforms outside the dangerous areas.

Special bunkering stations are recommended to be provided for this purpose.

3.2.1.6 Where steam or air is used for atomization of the well bore fluids, a non-return valve shall be fitted on the air or gas pipeline.

Such valve shall be part of the permanently installed pipeline, be readily accessible and located as close to the oil burner as possible.

3.2.2 Lubricating oil system.

3.2.2.1 For drilling ships, the requirements of Section 14, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2.2.2 Prime movers of generators and emergency fire pumps shall be provided with self-contained lubricating oil systems.

3.2.3 Cooling water system.

3.2.3.1 Unless otherwise specified, the applicable requirements of Section 15, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2.3.2 Cooling systems on self-elevating MODU shall ensure trouble-free operation of generator and auxiliary machinery prime movers under all operating conditions, including lifting and descending of the unit.

3.2.3.3 Sea inlets shall be provided with strainers and filters. Means shall be provided to enable the filters to be cleaned without interrupting the cooling water supply.

3.2.4 Compressed air system.

3.2.4.1 Unless otherwise specified, the applicable requirements of Section 16, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2.4.2 To start the diesel generators and to maintain functioning of the diesel engine control system, provision shall be made for a self-contained compressed air system.

3.2.4.3 The total amount of compressed air shall be sufficient to provide not less than six starts of the most powerful diesel engine among all the engines installed.

3.2.4.4 On MODU, the compressed air in an amount indicated in [3.2.4.3](#) shall be stored in not less than two air receivers or two groups of air receivers.

3.2.4.5 Starting air pipes shall be completely separated from air pipes for process needs. Use of starting air for process needs is not permitted.

3.2.4.6 On MODU, there shall be not less than two starting compressors for replenishing the starting air receivers, one of which may be an attached compressor.

In case of failure of any one compressor, the capacity of the remaining ones shall be sufficient for filling of air receivers mentioned in [3.2.4.4](#) during an hour beginning from the pressure at which starting of the engine is possible up to the pressure required to provide six starts.

3.2.4.7 For all types of MODU, the requirement of 16.2.3, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2.5 Exhaust gas system.

3.2.5.1 The exhaust gas pipes shall be laid and connected to equipment with due regard for the requirements of Section 11, Part VIII "Systems and Piping" of the Rules for the Classification.

3.2.5.2 The exhaust gas pipes of the internal combustion engines, the uptakes of boilers, galleys and incinerators shall be fitted with spark arresters of the design approved by the Register and shall terminate outside the dangerous areas.

3.2.6 Feed water system.

The boiler feed water systems of MODU shall be arranged with due regard for the applicable requirements of Section 17, Part VIII "Systems and Piping" of the Rules for the Classification.

3.2.7 Condensate system.

The condensate systems of MODU shall be arranged with due regard for the applicable requirements of Section 19, Part VIII "Systems and Piping" of the Rules for the Classification.

3.2.8 Steam and blow-off systems.

The steam and blow-off systems of MODU shall be arranged with due regard for the applicable requirements of Section 18, Part VIII "Systems and Piping" of the Rules for the Classification.

While laying steam lines of the steam and ice removal system intended solely for removal of ice appearing on the deck in winter time, the minimum distance from the pipeline insulation shall be observed:

to hull structures — 50 mm;

to cable runs — 50 mm.

3.2.9 Thermal oil systems.

The thermal oil systems of MODU shall be arranged with due regard for the applicable requirements of Section 20, Part VIII "Systems and Piping" of the Rules for the Classification.

3.2.10 Ventilation system of machinery spaces, accumulator battery rooms and boxes.

3.2.10.1 The ventilation system of machinery spaces, accumulator battery rooms and boxes shall comply with the requirements of 12.1.1 — 12.1.7, 12.5 and 12.10, Part VIII "Systems and Piping" of the Rules for the Classification.

3.2.10.2 Air intakers, ventilation drives of machinery spaces of Category A as well as of other machinery spaces using the DP-system equipment necessary for maintaining operational control over the integrity of the well on MODU or drilling ships shall be divided into independent groups to allow response to gas detection alarms while maintaining position keeping (also refer to 7.9.4, Part X "Electrical Equipment").

3.3 SPECIAL SYSTEMS

3.3.1 Ventilation system of dangerous spaces.

3.3.1.1 All enclosed dangerous spaces of zones 1 and 2 (refer to 2.9, Part X "Electrical Equipment") shall be equipped with ventilation of suction/exhaust type creating overpressure on the side of non-hazardous space or of a space with a lower explosion hazard.

Drop of the predetermined pressure in these spaces shall automatically actuate the fans.

3.3.1.2 Where the ventilation ducts pass through dangerous spaces of a higher level, the ventilation ducts shall have overpressure in relation to these spaces; where the ventilation duct passes dangerous spaces of a lower level, the ventilation duct shall have underpressure in relation to these spaces.

3.3.1.3 The dangerous spaces of zone 1 shall be provided with ventilation with controlled capacity providing the operation in two modes. At permissible gas concentration, the ventilation shall provide not less than 12 air changes per hour. In case where gas concentration amounts to $20 \pm 10\%$ of the lower explosive limit, the capacity of the ventilation shall be automatically increased to give not less than 20 air changes per hour.

3.3.1.4 The dangerous spaces of zone 2 shall be provided with ventilation providing not less than 12 air changes per hour.

3.3.1.5 Exhaust ducts of zone 1 shall be separated from those of zone 2. The internal spaces of such ducts like the spaces the ducts leave belong to the same zone. Inlets of the suction type ventilation of dangerous spaces shall be arranged outside dangerous areas. Outlet ends of ventilation ducts in dangerous spaces shall terminate in open areas of the same or lower explosion hazard.

3.3.1.6 Fans of safe type shall be used in the ventilation system of dangerous spaces.

3.3.2 Sea water supply system of self-elevating MODU.

3.3.2.1 The equipment of the system shall include tanks for storage of sea water for cooling needs, unless other method of cooling is provided, and to feed the fire extinguishing system. The cubic capacity of the tank intended for cooling shall be sufficient to meet the requirements of [3.2.3.2](#), and that of the tank intended for fire extinguishing shall be such as to ensure the operation of the installed water-based fire-extinguishing means as required in 3.2.7, Part VI "Fire Protection".

3.3.2.2 Appropriate measures shall be taken to prevent water freezing in tanks where required by service conditions.

3.3.2.3 The system shall be served with not less than two submersible power-driven pumps. The capacity of any of these pumps shall be not less than that required to supply water for cooling and to water-based fire extinguishing system.

3.3.2.4 The design capacity of the pumps shall be provided at all pump submersion depths possible during the operation.

3.3.2.5 Each sea water pump shall have its own suction protected from adverse effect of waves, ice and mechanical damage, provided with inlet screen and, where necessary, with heating arrangements.

3.3.2.6 The system shall be provided with measuring instruments and pressure alarms. Readout facilities shall be fitted in the main machinery control room.

3.3.3 Hydraulic jacking system of MODU.

3.3.3.1 The hydraulic system of MODU shall meet the applicable requirements of Section 7, Part IX "Machinery" of the Rules for the Classification.

3.3.3.2 The piping of hydraulic jacking mechanisms shall not communicate with other hydraulic systems.

3.3.3.3 In systems with considerable pressure surges, arrangements shall be provided to prevent pressure fluctuations.

3.3.3.4 The system shall not become inoperative on failure of one of the pumps.

3.3.3.5 Failure or damage of the hydraulic jacking mechanism pipes shall not result in spontaneous shifting of the MODU hull or legs by more than one step. The shifting speed shall not exceed the specified speed.

3.3.3.6 The working fluid used in the system shall retain its specified properties in all service conditions and shall not have harmful effect on the material of pipes and fittings.

3.3.3.7 Where any change in environmental temperature can have a marked influence on viscosity of the working fluid, arrangements shall be provided to prevent such influence in all specified temperature conditions.

3.3.3.8 The capacity of the working fluid tank of the hydraulic jacking mechanism of each leg shall be not less than that necessary for the total volume of working fluid filling the system.

3.3.3.9 The tanks of hydraulic drives shall be provided with low level alarms operating at the main control station.

3.3.3.10 The drainage pipes of the drip trays under the hydraulic equipment installed in spaces for hydraulic jacking mechanisms and tanks shall terminate in bilge tanks.

Pipes for collecting oil leakages shall meet the requirements in 13.5, Part VIII "Systems and Piping" of the Rules for the Classification.

3.3.4 Fuel system for helicopters.

3.3.4.1 The fuel system for helicopters shall be arranged with due regard for the requirements of 2.3, Part VI "Fire Protection".

3.3.4.2 The fuel distribution stations shall be situated in open areas and shall be as remote from accommodation spaces and potential sources of ignition as practicable.

3.3.4.3 Tanks containing fuel for helicopters shall be provided with inert gas system and with a device to prevent inadmissible pressure fluctuations in the tanks in case of temperature variations and when the tanks are being filled or emptied.

3.3.4.4 Where changeable fuel containers are used, they shall be installed in such a way as to enable them to be dumped in case of emergency.

The design of the containers shall be approved by the Register.

3.3.5 Process system and drilling rig piping.

3.3.5.1 The process system and drilling rig pipelines which may contain explosive gases or flammable liquids shall not pass through the accommodation and service spaces, control stations and machinery spaces.

The mentioned pipelines may pass through the tanks and dry compartments subject to fulfillment of explosion protection requirements depending on classification of spaces in 2.9, Part X "Electrical Equipment". In the presence of fittings and detachable joints in these spaces, the latter will be classified as dangerous zone 1, and in their absence — as dangerous zone 2.

3.3.6 Emergency mud dumping system.

3.3.6.1 The pipeline for emergency dumping of mud shall be equipped with two shut-off valves one of which shall be provided with position alarm monitored at the control station.

The valve closest to the mud tank shall be remotely operated from a readily accessible position above the bulkhead deck.

3.3.6.2 The pipeline for emergency dumping of mud shall not pass through the machinery, accommodation and service spaces.

3.3.6.3 The valves of the pipelines for emergency dumping of mud shall be installed with due regard for the requirements of 4.3.2.10, Part VIII "Systems and Piping" of the Rules for the Classification.

3.3.7 Process system.

3.3.7.1 Oil treating systems (well fluid gathering system; oil separation, stabilization, desalting and dehydration systems; associated petroleum gas gathering, treatment and utilization system) shall comply with the requirements in 2.1, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" and 3.1, 3.2, Part V "Systems and Piping" of the OGE Rules.

3.3.7.2 Gas treating systems (well fluid gathering system; gas separation and dehydration systems; gas condensate gathering and treatment system; absorbent regeneration system; gas compression system; gas-lift system) shall comply with the requirements in 2.1, 2.8, 2.9, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" and 3.1, 3.2, Part V "Systems and Piping" of the OGE Rules.

3.3.7.3 Chemical agent reception and storage; delivery and distribution systems shall comply with the requirements in 2.14.7, Part II "Drilling Rig Systems and Equipment" of the OGE Rules.

3.3.7.4 Flare systems shall comply with the requirements in 2.5, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" of the OGE Rules.

3.3.7.5 Systems for water gathering, treatment and injection into the bed (water treatment system; water distribution system; water injection system) shall comply with the requirements in 2.7 and 2.10, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" of the OGE Rules.

3.3.7.6 Hazardous drainage systems (open; closed) shall comply with the requirements in 2.7, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" of the OGE Rules.

3.3.7.7 Well fluid offloading systems (measuring system; transfer system) shall comply with the requirements in 2.12, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" and 3.4, Part V "Systems and Piping" of the OGE Rules.

3.3.7.8 Pressure release and gas withdrawal systems shall comply with the requirements in 2.6, Part III "Systems for Production, Treatment, Gathering and Transportation of Well Fluids" of the OGE Rules.

3.3.7.9 Well completion and flushing systems shall comply with the requirements in 2.14.8, Part II "Drilling Rig Systems and Equipment" of the OGE Rules.

Russian Maritime Register of Shipping

**Rules for the Classification and Construction of Mobile Offshore Drilling Units
Part VIII
Systems and Piping**

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