

# **RULES**

## **FOR THE CLASSIFICATION, CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS AND FIXED OFFSHORE PLATFORMS**

### **PART VII**

#### **MACHINERY INSTALLATIONS AND MACHINERY**

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# **RULES FOR THE CLASSIFICATION, CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS AND FIXED OFFSHORE PLATFORMS**

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Rules for the Classification, Construction and Equipment of Mobile Offshore Drilling Units (MODU) and Fixed Offshore Platforms of (FOP) 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 July 2022.

The present edition of the Rules is based on the 2018 edition taking into account the amendments and additions developed before publication.

The Rules set down specific requirements for MODU and FOP, consider the recommendations of the Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code), as adopted by the IMO Assembly on 2 December 2009 (IMO resolution A.1023(26)).

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 are published in the following parts:

Part I "Classification";

Part II "Hull";

Part III; "Equipment, Arrangements and Outfit of MODU/FOP";

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 "MODU and FOP 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".

These Rules supplement the Rules for the Classification and Construction of Sea-Going Ships and the Rules for the Equipment of Sea-Going Ships.

**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, Construction and Equipment of Mobile Offshore Drilling Units (MODU and Fixed Offshore Platforms (FOB))<sup>1</sup> apply to machinery installations, engines, machinery, equipment of machinery spaces essential to the safety of MODU and FOB.

Apart from this Part, the machinery installations of MODU/FOP, unless otherwise specified, are subject to all applicable requirements given in Parts VII "Machinery Installations", VIII "Systems and Piping", IX "Machinery", X "Boilers, Heat Exchangers and Pressure Vessels", XII "Refrigerating Plants" and XV "Automation" of the Rules for the Classification and Construction of Sea-Going Ships<sup>2</sup>. These requirements cover also the equipment, systems and piping of technological and drilling complexes, as applicable.

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<sup>1</sup> Hereinafter referred to as the " MODU/FOP Rules".

<sup>2</sup> Hereinafter referred to as "the Rules for the Classification".

## **1.2 DEFINITIONS AND EXPLANATIONS**

**1.2.1** Definitions and explanations relating to the general terminology are given in the General Regulations for Classification and Other Activity, Part I "Classification" and Part VI "Fire Protection" of the Rules for the Classification. Besides, all applicable definitions and explanations of Part VII "Machinery Installations" of the Rules for the Classification are also used.

**1.2.2** For the purpose of this Part, the following definitions have been adopted.

**Main control room of MODU/FOP** is a space containing the remote controls of main machinery and propellers of self-propelled MODU, jacking systems and mechanisms of self-elevating MODU, submersion and raising systems of submersible and semi-submersible MODU, machinery, equipment and arrangements providing generation of electrical power, as well as safe operation of MODU/FOP, and fitted with indicating instruments, alarms and means of communication.

**Machinery spaces** are all machinery spaces of category A and all other spaces containing propelling machinery, shafting, boilers, 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.

**Machinery spaces of category A** are all spaces, which contain main internal combustion engines or gas turbines or similar machinery for other purpose where such machinery has in the aggregate a total power of 375 kW and above, any oil-fired boilers or oil fuel units or oil fuel equipment other than boilers, such as inert gas generators, incinerators, etc., and trunks to such spaces.

**General purpose machinery spaces** are spaces containing machinery, equipment and arrangements intended for generating electrical power and to assure safe operation of MODU/FOP.

**Process machinery spaces** are spaces containing machinery, equipment and arrangements intended for constructing and operating the well.

**Control stations** are those spaces where the main navigational equipment, radio equipment, emergency sources of power, fire detection and fire control equipment, dynamic positioning control systems as well as ballast control systems for semi-submersible and submersible MODU are located. However, for the purpose of application of the requirements of Part VI "Fire Protection" of the MODU/FOP Rules, the space where the emergency source of power is located is not considered as a control station.

**Oil fuel unit** is the equipment used for preparation of oil fuel for delivery of heated or unheated oil to an oil-fired boiler or internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure more than 0,18 MPa.

Oil transfer pumps are not considered as oil fuel units.

### **1.3 SCOPE OF TECHNICAL SUPERVISION**

**1.3.1** General provisions relating to classification procedure, technical supervision during construction and surveys, as well as requirements for technical documentation to be submitted to the Register for review and approval are set forth in the General Regulations for Classification and Other Activity and in Part I "Classification" of the Rules for the Classification and in Part I "Classification" of the MODU/FOP Rules.

**1.3.2** In the process of MODU/FOP construction the machinery, equipment and systems covered by Parts VII "Machinery Installations", VIII "Systems and Piping", IX "Machinery", X "Boilers, Heat Exchangers and Pressure Vessels", XII "Refrigerating Plants" and XV "Automation" of the Rules for the Classification are subject to the Register technical supervision during manufacture, installation and tests.

Apart from that, the following shall be supervised by the Register:

- .1** jacking systems and mechanisms of self-elevating MODU;
- .2** remote control system of the jacking mechanisms of self-elevating MODU;
- .3** hydraulic driving machinery, lifting and lowering mechanisms of sea water supply pipes and submersible sea water pumps of self-elevating MODU;
- .4** hydraulic drive for closing preventers.

## **2 MACHINERY INSTALLATIONS. GENERAL REQUIREMENTS**

### **2.1 GENERAL**

**2.1.1** Power output of the main machinery in the drilling ships shall be chosen in accordance with 2.1, Part VII "Machinery Installations" of the Rules for the Classification, while the output of main machinery of the self - propelled MODU shall be sufficient to maintain steerability of the MODU when going backward under all normal operating conditions.

**2.1.2** All the external rotating parts of machinery and equipment (couplings, shafts, drives, belts, etc on the pumps, compressors, coolers, gas turbines and engines) shall be protected by guards.

**2.1.3** Where the equipment with increased noise level is used measures shall be taken to abate noise.

**2.1.4** Surfaces of the machinery, equipment and pipes which can be heated up to a temperature in excess of 220 °C shall be insulated.

**2.1.5** Where the used alternative design or arrangements deviate from the prescriptive provisions of the Rules, an engineering analysis, evaluation and approval of the design and arrangements in accordance with SOLAS regulation II-1/55 (IMO Guidelines on Alternative Design and Arrangements for SOLAS Chapters II-1 and III (MSC.1/ Circ.1212)).

**2.1.6** Automatic starting, operational and control systems for machinery essential for the safety of the MODU/FOP shall include provisions for manually overriding the automatic controls. Failure of any part of the automatic and remote control system shall not prevent the use of the override. Visual indication shall be provided to show whether or not the override has been actuated.

## **2.2 ENVIRONMENTAL CONDITIONS**

**2.2.1** All machinery, equipment and systems essential to the safe operation of MODU shall remain operative under the following conditions.

**2.2.1.1** Static conditions of inclination:

- .1 column-stabilized units - from upright to an angle of inclination of 15° in any direction;
- .2 self-elevating units - from upright to an angle of inclination of 10° in any direction;
- .3 surface units - from upright to an angle of inclination of 15° either way and simultaneously trimmed up to 5° by the bow or stem.

**2.2.1.2** Dynamic conditions for self-propelled MODU and drilling ships:

- .1 when a semi-submersible or submersible MODU is inclined to an angle up to 22,5° inclusive in any direction;
- .2 when a self-elevating MODU is inclined to an angle of 15° inclusive in any direction;
- .3 drilling ships at 22,5° rolling and simultaneous 7,5° pitching.

**2.2.2** The emergency sources of power shall remain operative under the following conditions:

- .1 when a semi-submersible or submersible MODU is inclined to an angle up to 25° inclusive in any direction;
- .2 when a self-elevating MODU is inclined to an angle up to 15° inclusive in any direction;
- .3 drilling ships at 22,5° rolling and simultaneous 10° pitching.

**2.2.3** In [2.2.1](#) and [2.2.2](#) the heeling angles are given for inclination either way, and the trimming and pitching angles are given for inclination by bow or stem.

When assigning the heeling angles differing from those indicated in [2.2.1](#) and [2.2.2](#), the substantiation shall be submitted confirming serviceability of all machinery, equipment and systems of propulsion plant, as well as the emergency power sources with due regard to MODU type, dimensions and operational conditions.



## **2.3 ARRANGEMENT OF MACHINERY AND EQUIPMENT**

**2.3.1** Internal combustion engines in hazardous areas (refer to 2.9, Part X "Electrical Equipment") and spaces is permitted in case the requirements in [2.3.1.1 — 2.3.1.4](#) are met:

**.1** machinery equipment in such areas shall be limited to that necessary for operational purposes;

**.2** machinery equipment and machinery in hazardous areas shall be so constructed and installed as to reduce to minimum the risk of ignition from sparking due to formation of static electricity or friction between moving parts and from high temperatures of exposed parts due to exhaust or other emissions;

**.3** installation of internal combustion machinery in zones 1 and 2 hazardous areas may be permitted, provided the precautions have been taken against the risk of dangerous ignition;

**.4** installation of the equipment that may be a cause of ignition in zone 2 hazardous areas may be permitted, provided the precautions have been taken against the risk of dangerous ignition.

**2.3.2** Air intakes for internal combustion engines and boilers shall be at a distance not less than 3 m from hazardous areas.

**2.3.3** Oil- or gas-fired boilers shall not be installed in hazardous spaces and areas.

**2.3.4** Pressure vessels of riser tensioning systems and heave compensating devices located on open decks and platforms shall be protected from mechanical damage and radiation effects.

**2.3.5** Drilling equipment in which oil products may be present shall not be located in spaces housing the main and auxiliary machinery.

## **2.4 CONTROL STATIONS**

**2.4.1** The main control room of MODU/FOP shall be located outside the machinery spaces and as far from hazardous areas as practicable.

**2.4.2** The equipment of the main machinery control room of MODU shall comprise:

- .1** controls of main machinery and propellers;
- .2** controls of the jacking mechanisms of self-elevating MODU;
- .3** controls of the submersion and raising systems of semi-submersible and submersible MODU;
- .4** instruments to monitor the operation of jacking system of self-elevating MODU, submersion and raising arrangements of semi-submersible and submersible MODU;
- .5** indicating devices to show that the jacking system and remote control systems are in operational readiness;
- .6** devices to monitor the MODU hull position (heel, trim, draught, clearance, etc.);
- .7** devices for disconnection of any of the jacking mechanisms in case of its failure;
- .8** devices for actuation of the emergency arresters relieving the hydraulic system (if any);
- .9** means of communication;
- .10** alarms to warn of the troubles in jacking system of self-elevating MODU, and in submersion and raising arrangements of semi-submersible and submersible MODU.

**2.4.3** In addition to the devices listed in 3.2.1, Part VII "Machinery Installations" of the Rules for the Classification the main machinery control room of the MODU shall be equipped with alarm and indication facilities according to 3.1.2.5.5, Part VIII "Systems and Piping" of the MODU/FOP Rules.

**2.4.4** Every jacking mechanism of self-elevating MODU shall be operable locally. The local control station shall comprise:

- .1** controls of the jacking mechanisms;
- .2** instruments to monitor operation of the jacking arrangements (pressure in hydraulic drive circuits, hydraulic control systems, hydraulic cylinder spaces);
- .3** means of two-way communication with the main machinery control room of MODU/FOP;
- .4** automatic overrides of local control when a dangerous inclination is reached.

## **2.5 MEANS OF COMMUNICATION**

**2.5.1** Two-way communication shall be provided between the main control room of MODU/FOP and machinery control room located in the machinery space.

**2.5.2** Two-way communication shall be provided between the ballast control station and the spaces in which the ballast pumps, valves and other equipment used in ballasting operations are situated.

**2.5.3** Two-way communication shall be provided between the drilling foreman's position and the machinery control room located in the machinery space, the main control room and other spaces containing equipment essential to the safety of MODU/FOP.

## **2.6 MACHINERY SPACES**

**2.6.1** Machinery spaces (refer to [1.2.2](#) of this Part and 1.2, Part VII "Machinery Installations" of the Rules for the Classification), as well as non-hazardous process machinery spaces shall not communicate with hazardous spaces and areas (refer to 2.9, Part X "Electrical Equipment"). If such communication cannot be avoided the relevant requirements of 2.9, Part X "Electrical Equipment" shall be met so that the safety of the machinery spaces and non-hazardous process machinery spaces is not affected.

**2.6.2** Every attended space or space which requires often visits of personnel shall have at least two escape routes arranged in the opposite ends of the space. Dead-end corridors exceeding 5 m in length shall not be permitted in such spaces.

**2.6.3** Hazardous process machinery spaces (refer to 1.2.2 of Part VI "Fire Protection") shall have at least two means of escape, one of which shall lead directly to the open deck.

## **2.7 VIBRATION OF MACHINERY AND EQUIPMENT**

**2.7.1** Vibration of machinery and equipment listed in [1.1](#) shall not exceed levels given in Section 9, Part VII "Machinery Installations" of the Rules for the Classification and shall not hinder operation of process machinery and equipment (refer to [1.2.2](#)).

**2.7.2** Vibration induced by industrial machinery and equipment shall not disturb normal operation of machinery and equipment listed in [1.1](#).

**2.7.3** All the machinery and equipment shall be installed on the foundations by a method that precludes onset of vibrations with unacceptable amplitudes when operating at full load with due regard for the possible seismic effect of the MODU/ FOP site.

## **2.8 REFRIGERATING PLANTS**

**2.8.1** The MODU/FOP are covered by all the requirements of Part XII "Refrigerating Plants" of the Rules for the Classification regarding unclassified and classed refrigerating plants in so much as applicable.

**2.8.2** Spaces containing refrigerating machinery and refrigerant piping shall be located outside the hazardous spaces and areas.

### **3 MACHINERY INSTALLATIONS FOR SELF-PROPELLED UNITS. ADDITIONAL REQUIREMENTS**

#### **3.1 GENERAL**

**3.1.1** The provisions of this Section apply to units which are designed to undertake self-propelled passages without external assistance and are not applicable to units which are fitted only with means for the purpose of positioning or of assistance in towing operations

These provisions are additional to those in [Sections 1](#) and [2](#).

**3.1.2** Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunction of:

- .1 a generator which serves as the main source of electrical power;
- .2 the sources of steam supply;
- .3 the arrangements for boiler feedwater;
- .4 the arrangements which supply fuel oil for boilers and engines;
- .5 the sources of lubricating oil pressure;
- .6 the sources of water pressure;
- .7 a condensate pump and the arrangements to maintain vacuum in condensers;
- .8 the mechanical air supply for boilers;
- .9 an air compressor and receiver for starting and control purposes; and
- .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable-pitch propellers.

**3.1.3** Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the unit shall, as fitted in the unit, be capable of operating under the static conditions in compliance with [2.2.1.1](#) and the following dynamic conditions:

- .1 column-stabilized units – 22,50 in any direction;
- .2 self-elevating units – 150 in any direction;
- .3 surface units – 22,50 rolling and simultaneously pitching 7,50 by bow or stern.

In case the MODU Technical Specification specifies the heeling angles differing from those indicated in [3.1.3.1 — 3.1.3.3](#), the serviceability of all machinery, equipment and systems of propulsion plant under these operational conditions shall be confirmed.

**3.1.4** Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in this machinery in normal operating ranges.

### **3.2 MEANS OF GOING ASTERN**

**3.2.1** Units shall have sufficient power for going astern to secure proper control of the unit in all normal circumstances.

**3.2.2** The ability of the machinery to reverse the direction of thrust of the propellers in sufficient time and so to bring the unit to rest within a reasonable distance from the maximum ahead service speed shall be demonstrated.

**3.2.3** The stopping times, unit headings and distances recorded on trials, together with the results of trials to determine the ability of units having multiple propellers to navigate and maneuver with one or more propellers inoperative, shall be available on board for the use of the Master or other designated personnel.

**3.2.4** Where the unit is provided with supplementary means for maneuvering or stopping, these shall be demonstrated and recorded as referred to in [3.2.2](#) and [3.2.3](#).



### **3.3 STEAM BOILERS AND BOILER FEED SYSTEMS**

**3.3.1** Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

**3.3.2** Every steam generating system which provides services essential for the propulsion of the unit shall be provided with not less than two separate feedwater systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Means shall be provided which will prevent overpressure in any part of the systems.

### **3.4 MACHINERY CONTROLS**

**3.4.1** Main and auxiliary machinery essential for the propulsion of the unit shall be provided with effective means for its operation and control. All control systems essential for the propulsion, control and safety of the unit shall be independent or designed such that failure of one system does not degrade the performance of another system. A pitch indicator shall be provided on the navigating bridge for controllable-pitch propellers.

**3.4.2** Where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:

**.1** the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigation bridge under all sailing conditions, including maneuvering;

**.2** the remote control shall be performed for each independent propeller by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where more than one propeller is designed to operate simultaneously, these propellers may be controlled by one control device;

**.3** the main machinery shall be provided with an emergency stopping device on the navigation bridge and independent from the bridge control system;

**.4** propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control station or at the maneuvering platform, as appropriate;

**.5** remote control of the propulsion machinery shall be possible from only one station at a time; at one control station interconnected control units are permitted. There shall be at each station an indicator showing which station is in control of the propulsion machinery. The transfer of control between navigating bridge and machinery spaces shall be possible only in the machinery space or machinery control room;

**.6** It shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;

**.7** the design of the remote control system shall be such that in case of its failure an alarm shall be given and the preset speed and direction of thrust be maintained until local control is in operation, unless the Administration considers this impracticable;

**.8** indicators shall be fitted on the navigating bridge for;

**.8.1** propeller speed and direction in case of fixed- pitch propellers;

**.8.2** propeller speed and pitch position in case of controllable-pitch propellers;

**.9** an alarm shall be provided at the navigating bridge and in the machinery space to indicate low starting air pressure set at a level which still permits main engine starting operations. If the remote control system for the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited to safeguard sufficient starting air pressure for starting locally; and

**.10** automation systems shall be designed in a manner which ensures a threshold warning of impending or imminent shutdown of the propulsion system is given to the officer in charge of the navigational watch in time to assess navigational circumstances in an emergency. In particular, the system shall control, monitor, report, alert and take safety action to slow down or stop propulsion while providing the officer in charge of the navigational watch an opportunity to manually intervene, except for those cases where manual intervention will result in total failure of the engine and/or propulsion equipment within a short time, for example in the case of overspeed.

**3.4.3** Where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room, this control room shall be designed, equipped and installed so that the machinery operation will be as safe and effective as if it were under direct supervision. Particular consideration shall be given to protection against fire and flooding.

### **3.5 STEERING**

**3.5.1** Except as provided in [3.5.18](#), units shall be provided with a main steering gear and an auxiliary steering gear.

The main steering gear and the auxiliary steering gear shall be so arranged that a single failure in one of them so far as is reasonable and practicable will not render the other one inoperative.

**3.5.2** The main steering gear shall be of adequate strength and sufficient to steer the unit at maximum service speed and this shall be demonstrated.

The main steering gear and rudder stock shall be so designed that they will not be damaged at maximum astern speed but this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

**3.5.3** The main steering gear shall, with the unit at its deepest seagoing draught, be capable of putting the rudder over from 35° on one side to 35° on the other side with the unit running ahead at maximum service speed. The rudder shall be capable of being put over from 35° on either side to 35° on the other side in not more than 28 s, under the same conditions.

**3.5.4** The main steering gear shall be operated by power where necessary to fulfil the provisions of [3.5.3](#) and in any case in which the Administration would require a rudder stock of over 120 mm diameter in way of the tiller (refer to 2.3.1, Part III "Equipment, Arrangement and Outfit", of the Rules for the Classification).

**3.5.5** The main steering gear power unit or units shall be arranged to start automatically when power is restored after a power failure.

**3.5.6** The auxiliary steering gear shall be of adequate strength and sufficient to steer the unit at navigable speed and capable of being brought speedily into action in an emergency.

**3.5.7** The auxiliary steering gear shall be capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 s with the unit at its deepest seagoing draught while running at one half of its maximum speed ahead or seven knots, whichever is the greater.

**3.5.8** The auxiliary steering gear shall be operated by power where necessary to fulfil the provisions of [3.5.7](#), and where the rudder stock is required of over 230 mm diameter (refer to 2.3.1 of Part III "Equipment, Arrangement and Outfit", of the Rules for the Classification).

**3.5.9** Where the main steering gear comprises two or more identical power units an auxiliary steering gear need not be fitted if the main steering gear is capable of operating the rudder in accordance with the provisions of [3.5.3](#) while operating with all power units. As far as is reasonable and practicable the main steering gear shall be so arranged that a single failure in its piping or in one of the power units will not impair the integrity of the remaining part of the steering gear.

**3.5.10** Control of the main steering gear shall be provided both on the navigating bridge and in the steering gear compartment. If the steering gear control system which provides for control from the navigating bridge is electric, it shall be supplied from the steering gear power circuit from a point within the steering gear compartment.

**3.5.11** When the main steering gear is arranged according to [3.5.9](#) two independent control systems shall be provided, each of which can be operated from the navigating bridge.

**3.5.12** Where the auxiliary steering gear is power operated, it shall be provided with a control system operated from the navigating bridge and this shall be independent of the control system for the main steering gear.

**3.5.13** Means shall be provided in the steering gear compartment to disconnect the steering gear control system from the power circuit.

**3.5.14** A means of communication shall be provided between the navigating bridge and:

- .1 the steering gear compartment; and
- .2 the emergency steering position, if provided.

**3.5.15** The exact angular position of the rudder, if power operated, shall be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system.

**3.5.16** The angular position of the rudder shall be recognizable in the steering gear compartment.

**3.5.17** An alternative power supply, sufficient at least to supply a steering gear power unit which complies with the provisions of [3.5.7](#) and also its associated control system and the rudder angle indicator, shall be provided, automatically, within 45 s, either from the emergency source of electrical power or from another independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose and shall have a capacity sufficient for 10 min of continuous operation.

**3.5.18** Where a non-conventional rudder is installed, or where a unit is steered by means other than a rudder, the steering system shall ensure that an acceptable degree of reliability and effectiveness, which is based on [3.5.1](#) and applicable requirements of Section 7, Part VII "Machinery installations" of the Rules for Construction, is provided.

### **3.6 ELECTRIC AND ELECTROHYDRAULIC STEERING GEAR**

**3.6.1** Indicators for running indication of the motors of electric and electrohydraulic steering gear shall be installed on the navigating bridge and at a suitable machinery control position.

**3.6.2** Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two circuits fed from the main switchboard. One of the circuits may pass through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying the main steering gear.

The circuits supplying an electric or electrohydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to the circuit and have to operate simultaneously.

**3.6.3** Short-circuit protection and overload alarm shall be provided for these circuits and motors. Protection against excess current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of appropriate starting currents. Where a three-phase supply is used, an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in the subparagraph shall be both audible and visual and be situated in a position on the navigating bridge where they can be readily observed.

### **3.7 COMMUNICATION BETWEEN NAVIGATING BRIDGE AND ENGINE ROOM**

**3.7.1** Units shall be provided with at least two independent means for communicating orders from the navigating bridge to the position in the machinery space or control room from which the engines are normally controlled, one of which shall provide visual indication of the orders and responses both in the engine room and on the navigating bridge. Consideration shall be given to providing a means of communication to any other positions from which the engines may be controlled.

### **3.8 ENGINEERS' ALARM**

**3.8.1** An engineers' alarm shall be provided to be operated from the engine control room or at the maneuvering platform, as appropriate, and clearly audible in the engineers' accommodation.

## 4 MACHINERY

### 4.1 GENERAL

**4.1.1** Machinery components listed in [Table 4.1.1](#) of this Part, as well as in Table 1.2.4, Part IX "Machinery" of the Rules for the Classification shall be supervised by the Register during manufacture with respect to observance of the requirements given in Parts XIII "Materials" and XIV "Welding" of the Rules for the Classification and the MODU/FOP Rules, as well as the approved technical documentation specified in 1.2.3, Part IX "Machinery" of the Rules for the Classification.

Table 4.1.1

| No  | Components  | Material                                    | Extent of testing  |
|---|---|---|--------------------|
| 1   | Jacking mechanisms of self- elevating MODU  |   |                    |
| 1.1   | Hydraulic cylinder, cover, rod  | Forged steel                                | 3.7.6 <sup>1</sup> |
| 1.2   | Hydraulic cylinder piston   | Ditto                                       | Ditto              |
| 1.3   | Securing parts  | Ditto                                       | Ditto              |
| 1.4   | Traverses of hydraulic cylinders  | Ditto                                       | Ditto              |
| 1.5   | Power transmission components (shafts, gear wheels and pinions of jacking mechanisms) | Refer to item 3 of Table 1.2.4 <sup>2</sup> |                    |
| 2   | Lifting/lowering mechanisms of outboard piping and submersible sea water pumps        | Refer to item 7 of Table 1.2.4 <sup>2</sup> |                    |
| 3   | Submersible sea water pumps   | Refer to item 5 of Table 1.2.4 <sup>2</sup> |                    |
| <sup>1</sup> Part XIII "Materials" of the Rules for the Classification. |   |   |                    |
| <sup>2</sup> Part IX "Machinery" of the Rules for the Classification.   |   |   |                    |

**4.1.2** It is permitted to utilize the power of main engines to drive the drilling machinery. In such case, the main engines shall be fitted with efficient means of protection from possible overload.

**4.1.3** Electrical equipment of the engines and machinery shall comply with the relevant requirements of Part XI "Electrical Equipment" of the Rules for the Classification.

**4.1.4** All the machinery and equipment essential to the safety of MODU shall remain operative under the conditions specified in [2.2.1 to 2.2.3](#).



## **4.2 INTERNAL COMBUSTION ENGINES**

**4.2.1** Engines intended for use in MODU/FOP shall comply with the requirements of Sections 2 and 9, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

### **4.3 GAS TURBINES**

**4.3.1** Gas turbines intended for use in MODU/FOP shall comply with the requirements of Section 8, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

#### **4.4 AUXILIARY MACHINERY**

**4.4.1** Auxiliary machinery intended for use in MODU/FOP shall comply with the requirements of Section 5, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

#### **4.5 DECK MACHINERY**

**4.5.1** Deck machinery intended for use in MODU/FOP shall comply with the requirements of Section 6, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

**4.5.2** Dynamic positioning system used as a sole means of position keeping shall provide a level of safety equivalent to that provided for anchoring arrangements.

## **4.6 JACKING MECHANISMS**

### **4.6.1 General requirements for jacking mechanisms for self-elevating units.**

**4.6.1.1** Jacking mechanisms for self-elevating units shall be arranged so that a single failure of any component does not cause uncontrolled descent of the unit.

**4.6.1.2** Jacking mechanisms shall be designed and constructed for the maximum lowering and lifting loads of the unit as specified in the unit's Operation Manual.

**4.6.1.3** Jacking mechanisms shall be able to withstand the forced imposed on the unit from the maximum environmental criteria for the unit.

**4.6.1.4** Jacking mechanisms shall be constructed such that the elevation of the leg relative to the unit can be safely maintained in case of loss of power (e.g., electric, hydraulic, or pneumatic power).

### **4.6.2 Control, communication and alarms**

**4.6.2.1** The elevating system shall be operable from a central jacking control station.

**4.6.2.2** The jacking control station shall have the following:

**.1** audible and visual alarms for jacking system overload and out-of-level. Units whose jacking systems are subject to rack phase differential shall also have audible and visual alarms for rack phase differential; and

**.2** instrumentation to indicate:

the inclination of the unit on two horizontal perpendicular axes;

power consumption for lifting or lowering the legs; and

brake release status.

**4.6.2.3** A communication system shall be provided between the central jacking control and a location at each leg.

#### **4.7 HYDRAULIC DRIVES**

**4.7.1** Hydraulic drives intended for use in MODU/FOP shall comply with the requirements of Section 7, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

#### **4.8 GEARS, DISENGAGING AND ELASTIC COUPLINGS**

**4.8.1** Gears, disengaging and elastic couplings intended for use in MODU/FOP shall comply with the requirements of Section 4, Part IX "Machinery" of the Rules for the Classification in so much as they are applicable.

Russian Maritime Register of Shipping

**Rules for the Classification, Construction and Equipment of Mobile Offshore Drilling Units and Fixed  
Offshore Platforms**

**Part VII**

**Machinery Installations and Machinery**

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