
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part P Mobile Offshore Drilling Units and Special Purpose Barges

RULES

2022 AMENDMENT NO.1

Rule No.45 30 June 2022

Resolved by Technical Committee on 26 January 2022

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

“Rules for the survey and construction of steel ships” has been partly amended as follows:

Part P MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

Amendment 1-1

Chapter 3 DESIGN LOADS

3.2 Design Loads

3.2.4 Current and Tidal Current Loads

Sub-paragraph -1 has been amended as follows.

1 ~~The~~ Current and tidal current loads are to be obtained ~~from the~~ as follows.

(1) Drag force

Drag force (F_D) per unit length along the member due to the current and the tidal current is to be obtained from following formula.

$$\del F_D = 5.03DC_D U_C |U_C| (kN/m)$$

$$F_D = 0.5\rho DC_D U_C \times |U_C| + 0.25\pi D^2 \rho C_M a_n (kN/m)$$

where

ρ : density of seawater 1.025 (t/m^3)

D : the projected width of the unit in the direction of the cross flow component of velocity.
(m)

C_D : drag coefficient in steady flow, ~~(the value is to be deemed appropriate by the Society)~~ (the value is to be deemed appropriate by the Society)

U_C : current velocity ($m/sec.$)

C_M : inertia coefficient in steady flow (value is to be deemed appropriate by the Society)

a_n : acceleration (m/s^2)

(2) Lifting force

Lifting force (F_L) per unit length along the member due to the current and tidal current is to be obtained from following formula.

$$\del F_L = 5.03DC_L U_C |U_C| (kN/m)$$

$$F_L = 0.5\rho DC_L U_C \times |U_C| (kN/m)$$

where

C_L : lifting force coefficient in steady flow, ~~(the value is to be deemed appropriate by the Society)~~ (the value is to be deemed appropriate by the Society)

ρ , D and U_C are specified in (1).

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 30 June 2022.

Chapter 1 GENERAL

1.2 Definitions

1.2.16 Hazardous Areas

Sub-paragraph -2 has been amended as follows.

2 Hazardous areas of mobile offshore drilling units are all those areas where, due to the possible presence of a flammable atmosphere arising from the drilling operations, the use of machinery or electrical equipment without proper consideration may lead to fire hazard or explosion. In addition, the hazardous areas are subdivided into Zones 0, 1 and 2, the definitions of each category being as follows:

- (1) Zone 0 is an area in which ~~an explosive gas-air mixture is~~ ignitable concentrations of flammable gases or vapours are continuously present or present for long periods.
- (2) Zone 1 is an area in which ~~an explosive gas-air mixture is~~ ignitable concentrations of flammable gases or vapours are likely to occur in normal operating conditions operation.
- (3) Zone 2 is an area in which ~~an explosive gas-air mixture is~~ ignitable concentrations of flammable gases or vapours are not likely to occur, and or in which such a mixture, if it does occurs, # will only exist for a short time.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2022.
2. Notwithstanding the amendments to the Rules, the current requirements apply to mobile offshore drilling units for which the date of contract for construction is before the effective date.
* “contract for construction” is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of “contract for construction” of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.
2. The date of “contract for construction” of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder. For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a “series of vessels” if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:
 - (1) such alterations do not affect matters related to classification, or
 - (2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.
3. If a contract for construction is later amended to include additional vessels or additional options, the date of “contract for construction” for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a “new contract” to which 1. and 2. above apply.
4. If a contract for construction is amended to change the ship type, the date of “contract for construction” of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:

This Procedural Requirement applies from 1 July 2009.

Chapter 10 POSITIONING SYSTEMS

10.7 Dynamic Positioning Systems

10.7.2 Installations Comprising the DPS

Sub-paragraph -1 has been amended as follows.

1 Redundant components and systems comprising the DPS are to be immediately available without needing manual intervention from operators and with such capacity that the dynamic positioning operation (hereinafter referred to as “DP-operation”²) can be continued for such a period that the work in progress can be terminated safely. The transfer of control is to be smooth and within acceptable limitations of the DP-operation for which the vessel is designed. ~~For Class 2 DPS, the transfer from one component or system to another is to be smooth and within acceptable limitations of the operation and to be capable automatically as far as possible or operator intervention is to be kept to a minimum.~~

Chapter 11 MACHINERY INSTALLATIONS

11.1 General

Paragraph 11.1.3 has been amended as follows.

11.1.3 Tests

1 Before installation on board, equipment and components constituting the machinery installations are to be tested at the plants provided with installations and equipment necessary for the tests (hereinafter referred to as “manufacturers, etc.” in this Part) in accordance with ~~the~~ relevant requirements in **Part D**.

2 Notwithstanding ~~the requirements in -1 above,~~ for machinery installations, (other than boilers, pressure vessels belonging to Group I or II and piping systems which contain inflammable or toxic liquids,) used solely for ~~the operations~~ which ~~is~~ are the intended purpose of the unit, ~~the~~ tests may be as deemed appropriate by the Society.

3 Notwithstanding ~~the requirements in -1 and -2 above,~~ for equipment manufactured by mass-production systems deemed appropriate by the Society, ~~the~~ test procedures suited to the production method may be accepted upon the request of the manufacturer.

4 ~~The~~ Systems or the equipment essential for the safety of the unit or for the propulsion of the unit (only applicable to ~~the units~~ which ~~have~~ the main propulsion machinery) are, ~~after installed on board,~~ to be subjected to performance tests after installation on board.

5 Remote control devices and automatic control devices attached to boilers are, ~~after installed on board,~~ to be subjected to performance tests after installation on board.

6 The safety devices required by this ~~Chapter~~ are, as a rule, ~~after installed on board,~~ to be subjected to performance tests after installation on board.

7 The Society may require, ~~when deemed necessary,~~ other tests than those specified in **11.1.3** when deemed necessary.

8 Mechanical components used for load carrying components, torque transmitting components, components for fixation systems and hydraulic components of jacking systems are to be subjected to the hardness tests and non-destructive tests specified in 5.5.1, Part D.

9 Rack and pinion jacking systems are to be tested in accordance with the following. However, in cases where such systems are of equivalent design, the Society may allow such tests to be omitted in consideration of established service histories.

(1) A load equivalent to 150 % of the maximum normal holding capacity rating of the unit is to be applied, and the climbing pinion is to make at least one complete revolution.

(2) The unit is to be disassembled and it is to be confirmed that all pinions and gears are free from abnormal defects by non-destructive tests deemed appropriate by the Society.

Paragraph 11.1.14 has been amended as follows.

11.1.14 Jacking Systems*

1 The following plans and documents are to be submitted to the Society in addition to those specified in Chapter 15, Part B.

(1) Plans and documents for approval

(a) A description of the jacking system and plans for its arrangement

(b) Rack and pinion jacking systems

i) Detailed plans for rack and pinions (including details of tooth geometry in cases where it is not an involute gear)

ii) Plans for power transmitting components, shafts, bearings, couplings, casings and brakes

- iii) Detailed plans for gear elements
- iv) Diagrams for electric and hydraulic control systems
- v) Detailed plans for hydraulic power packs
- iv) Detailed plans for electric motors (including specifications and operating characteristics)
- vii) Detailed plans for fixation systems (if provided)
- viii) Prototype test procedures (if applicable)
- (c) Ram and pin jacking systems
 - i) Detailed plans for hydraulic cylinders and control valves
 - ii) Details for pins and activating mechanisms
 - iii) Detailed plans and arrangements for pin holes
 - iv) Diagrams for electric and hydraulic control systems
 - v) Detailed plans for hydraulic power packs
 - vi) Detailed plans for electric motors (including specifications and operating characteristics)
 - vii) Detailed plans for the casings and supporting structures of the system (including fixed and movable crossheads)
- (d) Detailed plans for monitoring and alarm systems
- (e) Material specifications for load carrying components (racks and jackcases for rack and pinion units, jacking pins and yokes for hydraulically actuated units, etc.), torque transmitting components (climbing pinions, gears, pinions, planet carriers, pins, shafts, torque supports, couplings, coupling bolts, torque flanges, brakes, etc.), fixation system components and hydraulic components (hydraulic cylinders and actuators, etc.) of (b) and (c) above
- (f) Design calculations (including strength, fatigue, buckling, rigidity, critical speed (resonance) analysis) of (b) and (c) above
- (2) Plans and documents for reference
 - (a) Documents for Failure Modes and Effects Analysis (FMEA)
 - (b) Details and procedures for non-destructive tests for components subject to direct loads (including inspection locations, inspection types, and acceptance criteria)
 - (c) Details for operating temperature and heating arrangements for low-temperature service
 - (d) Limits for alignment and misalignment between rack and pinions

~~12~~ The ~~driving gear, mechanism, strength and safety device~~ material of load carrying components and torque transmitting components, fixation system components and hydraulic components of the jacking systems are to be those deemed appropriate by the Society suitable for the temperature conditions of operating areas of intended use and are to comply with **Part K**.

~~23~~ The jacking systems (including fixation systems in cases where separately equipped as holding mechanisms) are to be such as to maintain the safety of the unit in the event of failure of part of the system or the control device or loss of source of power for driving gear. A suitable monitoring device is to be provided at a permanently attended control station to indicate such failure.

4 With respect to ~~-3~~ above, Failure Modes and Effects Analysis (FMEA) is to be used to confirm that the safety of the unit will not be compromised by the jacking system.

~~35~~ Where electrical motors, hydraulic or pneumatic systems are used as a source of power for the jacking systems (including fixation systems in cases where separately equipped as holding mechanisms), two or more sets of sources of power are to be provided so as to be capable of operating the jacking system even when either one of the sets becomes out of action. However, one set may be acceptable for the units designated for use in restricted areas (except for units which have a large embarking capacity), one set may be acceptable.

~~46~~ ~~The elevating~~ Jacking systems (including fixation systems in cases where separately equipped as holding mechanisms) ~~is~~are be designed and constructed for the maximum lowering and lifting loads of the unit as specified in the unit's operation manual ~~in accordance with 18.2.2-1(8)~~ for at least the following loading conditions. In addition, friction loss from leg guiding and the effect of variation in location of the centre of gravity of the hull are to be included in the maximum lowering and lifting loads.

- (1) Normal lifting, lowering, holding of hull (static loading)
- (2) Pre-load lifting, lowering, holding of hull (static loading in cases where lifting and lowering, and combined loading in cases where holding)
- (3) Normal lifting, lowering, holding of legs (static loading)
- (4) Severe storm holding under the elevated condition and the afloat condition (combined loading)

~~7~~ Allowable stresses of mechanical components used in jacking systems (including fixation systems in cases where separately equipped as holding mechanisms) are to comply with the values specified in 7.2.2 under all loading conditions specified in -6 above. In addition, buckling strength and fatigue strength are to be in accordance with the requirements of 7.1.5 and 7.1.6 respectively. In the case of gears, tooth surface contact and tooth root bending are to be in accordance with requirements specified otherwise by the Society.

~~58~~ ~~The elevating~~ Jacking systems (including fixation systems in cases where separately equipped as holding mechanisms) ~~is~~are to be able to withstand the forces imposed on the unit from the maximum environmental criteria for the unit.

~~9~~ All lifting and lowering operations as well as applicable repeated loads are to be considered for fatigue strength. In the case of gears, the following safety factors are to be applied for cumulative fatigue in the fatigue design life.

 Tooth surface contact: 1.0

 Tooth root bending: 1.5

~~10~~ In cases where hydraulic cylinders are used as power sources for ram and pin jacking systems, the requirements of Chapter 10, Part D are to be applied mutatis mutandis. For piping attached to such cylinders, the requirements of Chapter 12 and Chapter 13, Part D are to be applied mutatis mutandis.

~~611~~ ~~The elevating~~ Jacking systems ~~is~~are to be operable from a central jacking control stations.

~~712~~ ~~The~~ Jacking control stations ~~is~~are to be provided for the following safety devices:.

- (1) Audible and visual alarms for jacking system overload and out-of-level. For rack and pinion jacking systems, visible and audible alarms for rack phase differential are to be provided in cases where required for design reasons.
- (2) Indicators for the following:
 - (a) The inclination of the unit on two horizontal perpendicular axes
 - (b) Power consumption or other indicators for lifting or lowering the legs, (as applicable)
 - (c) Brake release status

~~813~~ ~~A~~ Communication systems ~~is~~are to be provided between ~~the~~ central jacking controls and ~~a~~ locations at each leg.

Chapter 12 ELECTRICAL INSTALLATIONS

12.1 General

12.1.3 Tests*

Sub-paragraph -3 has been amended as follows.

3 Electrical installations used for the systems or the equipment essential for the safety of the unit or for the propulsion of the unit (only applicable to the unit which has the main propulsion machinery) and listed in the following (1) to (6) are to be subjected to type tests for each of products. However, in cases where it is inadequate to deal with them under the requirements for type tests (e.g. those used only for specific ships or purposes with little possibility of continued use, or items for which the acquisition of individual test/inspection certificates is desired), tests and inspections of individual products may be accepted in place of type tests when requested by application.

((1) to (6) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

1. The effective date of the amendments is 1 July 2022.
2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction is before the effective date.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part P Mobile Offshore Drilling Units and Special Purpose Barges

GUIDANCE

2022 AMENDMENT NO.1

Notice No.31 30 June 2022

Resolved by Technical Committee on 26 January 2022

Notice No.31 30 June 2022

AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

Part P MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

P11 MACHINERY INSTALLATIONS

P11.1 General

Paragraph P11.1.14 has been added as follows.

P11.1.14 Jacking Systems

1 In applying **11.1.14-2, Part P of the Rules**, materials are to meet the specified values for impact tests equivalent to or greater than those of steels used for hull construction in cases where materials are used for which there are no specified values for the impact tests in **Part K of the Rules**.

2 The wording “permanently attended control station” specified in **11.1.14-3, Part P of the Rules** means the locations where jacking systems are controlled. In cases where fixation systems are separately provided as holding mechanisms, the locations where such systems are controlled are also included.

3 The wording “requirements specified otherwise by the Society” specified in **11.1.14-7, Part P of the Rules** means the requirements specified in **Annex 5.3.5, Part D of the Rules**.

P12 ELECTRICAL INSTALLATIONS

P12.1 General

P12.1.3 Tests

Sub-paragraph -6 has been deleted.

~~6 For electrical appliances and cables specified in 12.1.3.3, Part P of the Rules where it is inadequate to deal with them under the requirements of type approval (e.g. those used only for specific unit or purpose with little possibility of continued use, or items for which acquisition of individual test/inspection certificates is desired), tests and inspection on individual product items may be accepted by application in place of type approval tests.~~

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 July 2022.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships for which the date of contract for construction is before the effective date.