
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part P

**Mobile Offshore Drilling Units,
Work-ships and Special Purpose Barges**

2009 AMENDMENT NO.2

Rule No.45 30th October 2009

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

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

Part P MOBILE OFFSHORE DRILLING UNITS, WORK-SHIPS AND SPECIAL PURPOSE BARGES

Chapter 1 GENERAL

1.1 General

Paragraph 1.1.1 has been amended as follows.

1.1.1 Application

1 The requirements in this Part apply to the materials, welding, stability, hull construction, equipment, positioning systems, machinery installations, electrical installations, fire protection and detection system, fire extinguishing systems, means of escape and load lines of mobile offshore drilling units, work-ships and special purpose barges, etc., notwithstanding the requirements in other Parts. The mobile offshore drilling units, work-ships and special purpose barges, etc., (hereinafter referred to as “units” in this Part) are steel-made floating structures engaged in specific operation, ship-type units and barge-type units but not primarily intended for the carriage of cargoes or those positioned for a long periods of time or semi-permanently at a specific sea area, or fixed at a specific sea area.

2 ~~For units provided with positioning systems satisfied with the requirements in this Part, Class notations corresponding to the type of the positioning systems of the units will be affixed to the Classification characters. FPSO, FPO and FSO defined in 1.2.1, Part PS are to be according to~~ Part PS notwithstanding the requirements given in this Part.

Paragraph 1.1.6 has been amended as follows.

1.1.6 Class Notations

1 For units complying with the ~~relevant~~ requirements in this Part, an appropriate Class notations deemed necessary by the Society corresponding to the type and purpose of units will be affixed to the Classification Characters.

2 For units provided with positioning systems satisfied with the requirements in this Part, an appropriate notation corresponding to the type of the positioning systems of the units will be affixed to the Classification Characters.

1.2 Definitions

Paragraphs 1.2.2 to 1.2.7 have been amended as follows.

1.2.2 Type of Units

Units are classified into the following four groups depending upon their types:

(1) Self-elevating unit

Self-elevating unit is a unit having hulls with sufficient buoyancy to safely transport the unit to the desired location, after which the hull is raised to a predetermined elevation above the sea surface on its legs, which are supported by the ~~sea bed seabed~~. Equipment and supplies may be transported on the unit, or may be added to the unit in its elevated position. The legs of such units may penetrate the ~~sea bed seabed~~, may be fitted with enlarged sections or footings to reduce penetration, or may be attached to bottom pads or mats.

(2) Column stabilized unit

Column stabilized unit is a unit which depends upon the buoyancy of widely spaced columns for floatation and stability for all afloat modes of operation or in the raising or lowering of the unit, as may be applicable. The columns are connected at their top to an upper structure supporting the equipment. Lower hulls or footings may be provided at the bottom of the columns for additional buoyancy or to provide sufficient area to support the unit on the ~~sea bed seabed~~. Bracing members of tubular or structural sections may be used to connect the columns, lower hulls or footings and to support the upper structure. Designated Operations may be carried out in the floating condition, in which condition the unit is described as a semi-submersible, or when supported by the ~~sea bed seabed~~, in which condition the unit is described as submersible. A semi-submersible unit may be designed to operate either floating or supported by the ~~sea bed seabed~~, provided each type of operation has been found to be satisfactory.

(3) Ship-type unit

Ship-type unit is a seagoing ship-shaped unit having a displacement type hull or hulls, of the single, catamaran or trimaran type, which has been designed or converted for designated operations in the floating condition or seagoing condition. The unit of this type has propelling machinery.

(4) Barge-type unit

Barge-type unit is a seagoing unit having a displacement type hull or hulls, which has been designed or converted for operations in the floating condition. The unit of this type has no propelling machinery.

1.2.3 Purposes of Units

Units are classified into the following eight groups depending upon their purposes :

(1) Mobile offshore drilling unit

Mobile offshore drilling unit is a unit which is provided with drilling equipment for the exploration for and exploitation of resourced beneath the ~~sea bed seabed~~ such as crude oil, natural gases, and so on.

(2) Work-ship

A work-ship is a unit, other than mobile offshore drilling units, ~~such as dredger, crane ship, etc.~~ engaged in the appointed an designated operation such as the lifting of heavy loads, fire fighting, offshore supply towing, etc. at sea. The following units are so-called work-ships.

(a) Dredgers

A dredger is a unit engaged in dredging sand and rocks from the seabed.

(b) Crane ships

A crane ship is a unit engaged in lifting heavy loads and moving such load vertically

and horizontally.

(c) Vessels engaged in towing operations

i) Tugs

A tug is a unit primary engaged in towing ships when such ships leave or come into a port and leave or come alongside the shore, or towing non self-propelled units, floating units, etc.

ii) Ocean tugs

A Ocean tug is a unit engaged in towing non self-propelled units, floating units, etc. in the ocean.

(d) Pusher tugs

A pusher tug is a unit that pushes barges forward with its bow.

(e) Fire fighting vessel

A fire fighting vessel is a unit engaged in fire fighting operations.

(f) Offshore supply vessels

An offshore supply vessel is a vessel primary engaged in the supply of stores such as water and fuel oil, materials and equipment to offshore installations; and, for the purpose of this Part, which is designed with accommodation and bridge erections in the forward part of the unit and an exposed cargo deck in the after part for the handling of cargo at sea.

(g) Anchor handling vessels

An anchor handling vessel is a unit engaged in the installation, moving and taking up of the mooring anchors of mobile offshore drilling units, dredgers, etc.

(h) Vessels engaged in laying objects on the seabed

i) Cable laying vessels

A cable laying vessel is a unit engaged in laying cable on the seabed.

ii) Pipe laying vessels

A pipe laying vessel is a unit engaged in laying pipes on the seabed.

(3) Storage units

Storage unit is a unit primarily for storage of inflammable liquids such as crude oil, and stationed for a long periods of time or semi-permanently.

(4) Moored floating units

Moored floating unit is a unit used for the special purpose in which a number of passengers are on board, whose structure has two and more decks or whose spaces are enclosed of which are used for this purpose.

(5) Plant barges

Plant barge is a unit which is installed with equipment for the industrial factory, and fixed or stationed semi-permanently or for a long periods of time under floating condition at its service area.

(6) Accommodation barges

Accommodation barge is a unit with no propelling machinery which has accommodation for particular personnel or passengers. This unit is to be stationed at smooth water areas or sea areas equivalent thereto. In addition, during moving of this unit, there is not to be anyone except operator for moving operation on board.

(7) Floating piers

Floating pier is a unit which has mooring equipment, loading apparatus, etc. for loading or unloading and has bridges for access from the shore. This unit is to be stationed semi-permanently or for a long periods of time under floating condition at its service area.

(8) Other types of units

Other types of units are units other than those specified in (1) to (7).

1.2.4 Modes of Operation

A mode of operation is a condition or manner in which a unit may operate or function while on location or in transit. In the requirements of this Part, the approved modes of operation of a unit are defined as follows:

- (1) Operating condition
Operating condition is a condition wherein a unit is on location for purposes of operations, and combined environmental and operational loadings are within the appropriate design limits established for such operations. The unit may be either afloat or supported by the ~~sea-bed~~ seabed, as applicable.
- (2) Severe storm condition
Severe storm condition is a condition during which a unit may be subjected to the severest environmental loadings for which the unit is designed. Operations are assumed to have been discontinued due to the severity of the environmental loadings. The unit may be either afloat or supported by the ~~sea-bed~~ seabed, as applicable.
- (3) Transit condition
Transit condition is a condition wherein a unit is moving from one geographical location to another without any operation of its purpose.
- (4) Temporary mooring condition
Temporary mooring condition is a condition wherein a unit is temporarily moored in the afloat condition.

1.2.5 Length of Unit (*L*)

- 1 For self-elevating units and barge-type units, length is the distance in metres on the summer load line, between the insides of shell platings at the fore and after ends.
- 2 For column stabilized units, length is the maximum distance in metres between the fore and after ends of the primary hull structure which is projected to the centre line of the hull.
- 3 For ship-type units, length is the distance in metres on the summer load line, from the fore side of the stem to the centre of the rudder stock, or 96 % of the length on the summer load line, whichever is greater. Where a ship does not have a rudder, length is 96 % of the length on the summer load line.

1.2.6 Breadth of Unit (*B*)

- 1 For column stabilized units, breadth is the horizontal distance in metres measured perpendicularly to the longitudinal centre line at the broadest part of the primary hull structure.
- 2 For self-elevating units, ship-type units and barge-type units, breadth is the horizontal distance in metres between outsides of frames at the broadest part of the hull.

1.2.7 Depth of Unit (*D*)

- 1 For column stabilized units, depth is the vertical distance in metres from the top of bottom plating of the lower hull or footing to the top of beam of the uppermost continuous deck at side measured at the middle of *L*.
- 2 For self-elevating units, ship-type units and barge-type units, depth is the vertical distance in metres from the top of bottom plating to the top of beam of the uppermost continuous deck at side measured at the middle of *L*.

Paragraph 1.2.9 has been amended as follows.

1.2.9 Design Water Depth

Design water depth is the vertical distance in metres from the ~~sea-bed~~ seabed to the mean low

water level plus the height of astronomical and storm tides.

Paragraphs 1.2.22 to 1.2.24 have been amended as follows.

1.2.22 Unit for ~~Self-Propelled~~ Self-Propulsion System

The unit for ~~self-propelled~~ self-propulsion system is the unit which are to undertake ~~self-propelled~~ self-propulsion passages without external assistance.

1.2.23 Units Fixed on the ~~Sea-Bottom~~ Seabed or Positioned Semi-~~Permanently~~

Units fixed on the ~~sea-bottom~~ seabed or positioned semi-~~permanently~~ mean that the units are fixed on the ~~sea-bottom~~ seabed or positioned at a specific sea area over 36 months which is the maximum interval of Docking Survey specified in **1.1.3, Part B**, ~~and applied to the requirements of Chapter 13, Part B.~~

1.2.24 Units Fixed on the ~~Sea-Bottom~~ Seabed or Positioned for ~~a~~ Long Periods of Time

Units fixed on the ~~sea-bottom~~ seabed or positioned for ~~a~~ long periods of time mean that the units are fixed on the ~~sea-bottom~~ seabed or positioned at a specific sea area over 30 days, ~~and applied to the requirements of Chapter 12 or Chapter 13, Part B.~~

Chapter 3 DESIGN LOADS

3.1 General

Paragraph 3.1.1 has been amended as follows.

3.1.1 General

1 In regard to loads in determining scantlings of structural members and in calculating mooring forces for the units fixed on the seabed or positioned for long periods of time, unless otherwise specified elsewhere, the following **(1)** to **(16)** are to be taken into account, where applicable:

- (1) Wind loads;
- (2) Wave loads;
- (3) Deck loads;
- (4) Loads due to helicopter;
- (5) Static loads such as water pressure in still water, buoyancy, dead load, etc.;
- (6) Loads caused by tide and current;
- (7) Loads caused by floating ice;
- (8) Loads caused by snow and icing;
- (9) Loads caused by earthquake in the case of bottoming-type units;
- (10) Impact loads caused by touching ~~sea bed~~ seabed;
- (11) Loads caused by mooring;
- (12) Loads caused by mooring of tenders;
- (13) Loads caused by towing;
- (14) Loads caused by operation;
- (15) Loads due to increase of resistance by marine growth;
- (16) Other loads considered necessary.

2 ~~The criteria in the design of the loads acting upon the units and their structural members~~ The design loads specified in -1 are to be based upon statistical data and considerations are to be given to the severest condition anticipated in the period of at least 50 years. However, for large sized oil storage barges and those units considered necessary by the Society, the period is to be 100 years, and for units or towed barge-type units provided with ~~self-propelled~~ self-propulsion system, the period may be 25 years.

3 Notwithstanding the requirements of -2, in case where considering to the purpose of unit, employment period, etc. and those are approved by the Society, the design loads acting upon the unit in the most severe condition anticipated in the period which specified by the Owner may be used.

4 Units except for units fixed on the seabed or positioned for long periods of time may be according to relevant requirements given in Part C, Part CS or Part Q. However, in cases where loads produced by designated operations cannot be ignored, such loads are to be considered in addition to the requirements.

Chapter 4 STABILITY

4.1 General

Paragraph 4.1.1 has been amended as follows.

4.1.1 Application

~~1 All mobile offshore drilling units and column stabilized units otherwise these purpose of units are to meet the stability requirements in this Chapter. Stability of units is to be in accordance with the requirements given in this Chapter.~~

~~2 Self-elevating units except mobile offshore drilling units are to meet the requirements in this Chapter or Part U with regard to the intact stability. These units are to meet the requirements of this Chapter or Chapter 4, Part C with regard to the damage stability. Regarding damage stability and intact stability of units, notwithstanding the requirements of -1, ship-type and barge-type units, except for units fixed on the seabed or positioned for long periods of time, are to be according to Part U and Chapter 4, Part C. In addition, when deemed necessary by the Society, additional requirements may be requested.~~

~~3 Ship type and barge type units except mobile offshore drilling units are to meet the requirements in this Chapter or Part U with regard to the intact stability. These units are to meet the requirements of this Chapter or Chapter 4, Part C with regard to the damage stability.~~

4.1.2 General

Sub-paragraph -2 has been amended as follows.

1 All units are to meet the stability requirements in this Chapter for all applicable condition.

2 For units embedded on the ~~sea bottom~~ seabed, the stability of these are to satisfactory to the Society.

(Sub-paragraphs -3 to -5 are omitted.)

4.2 Intact Stability Criteria

Title of 4.2.4 has been amended as follows.

4.2.4 Ship-Type and Barge-Type Unit

4.3 Extent of Damage depending on the Type of Units

Paragraph 4.3.4 has been amended as follows.

4.3.4 Ship-Type and Barge-Type Unit

In assessing the damage stability of ship-type and barge-type units, the following extent of damage is to be assumed to occur between effective watertight bulkheads:

(Sub-paragraphs (1) to (4) are omitted.)

4.4 Damage Stability Criteria

Title of 4.4.3 has been amended as follows.

4.4.3 Ship-Type or Barge-Type Unit

Chapter 5 WATERTIGHT BULKHEADS

5.1 Watertight Bulkheads

5.1.1 General

Sub-paragraph -1 has been amended as follows.

1 Watertight bulkheads of ship-type and barge-type units are to be in accordance with the requirements in **Chapter 13, Part C** or **Chapter 13, Part CS** and **Chapter 10, Part Q**. However, the arrangement of watertight bulkheads of the units to be provided in a specified sea area and in a restricted area for a long period of time or semi-permanently or in case where the arrangements of watertight bulkheads are approved by the Society is to be at the discretion of the Society.

(Sub-paragraphs -2 to -5 are omitted.)

5.2 Closing Appliances

Paragraph 5.2.1 has been amended as follows.

5.2.1 General

1 The construction and closing appliances of openings through which the sea water is likely to flow in are to be in accordance with the requirements in this Section, in addition to the requirements given in Part C or Part CS.

2 Notwithstanding the requirements given in -1 above, the construction and closing appliances of the openings through of units, except for units fixed on the seabed or positioned for long periods of time, need not apply the requirements given in 5.2.2 to 5.2.4.

~~**3**~~ Closing appliances provided in column stabilized units, which are not located within areas of calculated immersion and for which special considerations are given, are to be at the discretion of the Society.

Paragraph 5.2.5 has been added as follows.

5.2.5 Additional requirements for work-ships

1 Access to the machinery spaces of category A of offshore supply vessels is to be arranged within the forecabin as far as possible. Any access to such machinery spaces from exposed cargo decks is to be provided with two weathertight closures.

Chapter 6 HULL CONSTRUCTION

Section 6.1 has been amended as follows.

6.1 General

6.1.1 Application

1 Hull construction of units fixed on the seabed or positioned for long periods of time are complied with the requirements of this Chapter. Where, however, the service area, operation area or operation season is restricted, the construction and equipment of the unit may be suitably modified basing on its condition subject to the approval by the Society.

2 Unless otherwise specially specified in this Chapter, the relevant requirements in **Part C**, **Part CS** and **Part Q** correspondingly apply.

3 The hull construction of units, except for units listed in -1 above, is to be according to 6.5, in addition to relevant requirements given in Part C, Part CS or Part Q.

6.2 Materials for Structural Members

6.2.1 Categories of Structural Members

Sub-paragraph -2 has been amended as follows.

1 (Omitted)

2 Categories of structural members of ship-type units and barge-type units are to be grouped into the three categories of following (1) to (3).

(Sub-paragraphs (1) to (3) are omitted.)

6.2.2 Application of Steels

Sub-paragraph -1 has been amended as follows.

1 Application of rolled steels for units is to be **Fig.P6.1** to **Fig.P6.4** depending upon the category of structural members defined in **6.2.1**, thickness and service temperature defined in **1.2.11**. Application of rolled steels for ship-type units and barge-type units, however, is to be accordance with **Table C1.1** and **Table C1.2** specified in **Part C** when the service temperature is over -10°C .

(Sub-paragraphs -2 and -3 are omitted.)

6.5 Ice Strengthening

Paragraph 6.5.1 has been amended as follows.

6.5.1 General

- 1 As for units which are to ~~work or navigate~~ be engaged in operations in ice-covered waters, special considerations ~~are~~ is to be paid to ice strengthening.
- 2 ~~Ship type units and barge type units~~ Ships intended for navigation in ice covered waters are to be reinforced in accordance with the requirements of **Chapter 5, Part I**.

Chapter 7 ~~STRENGTH OF HULL~~ HULL STRENGTH

Section 7.1 has been amended as follows.

7.1 General

7.1.1 Application

1 The hull strength of units fixed on the seabed or positioned for long periods of time is to be according to this Part. However, in case where service areas or operation seasons are restricted, the hull construction of units may be suitably modified based on certain conditions subject to Society approval.

2 The hull strength of units, except for units not listed in -1 above, are to be according to 7.7 in addition to relevant requirements given in Part C, Part CS or Part Q.

3 The hull strength of units, except for units not listed in -1 and -2 above, is to be at the discretion of the Society.

~~7.1.1~~7.1.2 Structural Analysis

The unit is to be analyzed by a method deemed appropriate by the Society for a sufficient number of conditions including all conditions

~~7.1.2~~7.1.3 Analysis of Units embedded on the ~~Sea Bottom~~ Seabed

Units designed to be embedded on the ~~sea bottom~~ seabed are to be analyzed assuming the over turning moment due to the combined environmental forces from any direction and the sufficient downward gravity loadings on the support footings or mat to withstand the moment.

~~7.1.3~~7.1.4 Plastic Analysis

Scantlings of structural members designed basing upon plastic analysis are to be at the discretion of the Society.

~~7.1.4~~7.1.5 Buckling Strength

Structural members are to have sufficient strength against buckling in consideration of their shapes, scantlings, boundary conditions, etc.

~~7.1.5~~7.1.6 Fatigue Strength

Structural members subject to repeated stress are to have sufficient fatigue strength, taking the value and number of cycles of the repeated stress, the shape of members, etc. into consideration.

~~7.1.6~~7.1.7 Stress Concentration

The effect of local stress concentrations is to be considered for notches in members or discontinuous parts of structure.

~~7.1.7~~7.1.8 Bending Stress

1 The section moduli of members required by the Rules are those including the steel plates with the effective breadth of $0.1l$ on either side of members. However, the breadth of $0.1l$ is not exceed one-half of the spacing of member. l is the length specified in the relevant members.

2 Where subjected to eccentric loadings, an increase of bending stresses due to the deflections of the structural members is to be taken into account.

7.1.8~~7.1.9~~ **7.1.9** Shearing Stress

When calculating shearing stresses in bulkheads, plate girder webs, hull side plating, etc., only the effective shear area of web is to be considered as being effective. In this regard, the total depth of the girder may be considered as the web depth.

7.1.9~~7.1.10~~ **7.1.10** Combination of Stresses

1 In obtaining respective local stresses of the structural members, all the stress components concerned are to be summed up. In this case, for tubular members, the effect of circumferential stress due to external pressure is to be considered.

2 The scantlings are to be determined on the basis of criteria which combine, in a rational manner deemed appropriate by the Society, the individual stress components acting on the respective structural members.

7.1.10~~7.1.11~~ **7.1.11** Equivalent Stress

For plated structures, members may be designed according to the equivalent stress criterion, where the equivalent stress is obtained from the following formula:

$$\sqrt{\sigma_x^2 + \sigma_y^2 - \sigma_x \sigma_y + 3\tau_{xy}^2} \text{ (N/mm}^2\text{)}$$

σ_x and σ_y : Stress in the X- and Y- directions at the centre of thickness of the plate, respectively (N/mm²)

τ_{xy} : Shearing stress in the X-Y plane (N/mm²)

7.1.11~~7.1.12~~ **7.1.12** Corrosion Allowance

1 Where the unit is not fitted with a corrosion protection system deemed appropriate by the Society, the scantlings are to be those determined by the analyzing method specified above in conjunction with the allowable stresses specified by the Rule added by a proper corrosion allowance. In this case, the corrosion allowance is, as a rule, not to be less than 2.5 mm and is to be determined considering the environmental condition, the means and degree of corrosion protection specified in 6.3 and the process of its maintenance. And further, where the requirements in **Part C**, **Part CS** or **Part Q** are applied, the scantlings are not to be less than those specified in the relevant requirements.

2 In case where the unit is fitted with a corrosion protection system deemed appropriate by the Society, with regard to the corrosion allowance specified in -1, modification may be made as deemed adequate by the Society.

7.2 Analysis of Overall Strength

Paragraph 7.2.1 has been amended as follows.

7.2.1 Loading Conditions

Analysis of overall strength is to be performed for the static loading and combined loading specified in the following (1) and (2) in the respective modes of operation:

- (1) The static loading is a condition in which the unit is afloat or embedded on the ~~sea bottom~~ seabed in calm sea and is loaded with static loads only such as loads taken in operating condition, dead load of the unit, etc. which affect the overall strength.
- (2) (Omitted)

7.4 Self-Elevating Units

Paragraphs 7.4.2 and 7.4.5 have been amended as follows.

7.4.2 Legs

Legs are to be in accordance with the requirements in the following (1) to (7), in addition to the requirements in 7.4.1. However, with regard to the motions of the unit and legs, they may be determined by an analytical method or from a model experiment deemed appropriate by the Society.

- (1) Legs are to be either shell type or truss type, and, as a rule, footings or bottom mats are to be fitted. Where footings or bottom mats are not fitted, proper consideration is to be given to the leg penetration of the ~~sea-bed~~ seabed and the end fixity of the leg. In strength calculation of such a leg, the leg is to be assumed as pin-supported at a position at least 3 metres below the ~~sea-bottom~~ seabed.
- (2) (Omitted)
- (3) (Omitted)
- (4) Legs are to be designed to withstand the dynamic loads which may be encountered by their unsupported length just prior to touching bottom, and also to withstand the shock of touching ~~sea-bottom~~ seabed while the unit is afloat and subject to wave motions.
(Sub-paragraphs (5) to (7) are omitted.)

7.4.5 Bottom Mats

(Sub-paragraphs -1 to -3 are omitted.)

- 4 Where the unit is resting on the ~~sea-bed~~ seabed, the effects of scouring are also to be considered.
- 5 The effects of skirt plates, where provided, are to be specially considered.
- 6 Mats are to be designed to withstand the shock of touching ~~sea-bottom~~ seabed while the unit is afloat and subject to wave motions.

Paragraph 7.5.3 has been amended as follows.

7.5.3 Columns, Lower Hulls and Footings

(Sub-paragraphs -1 to -4 are omitted.)

- 5 Particular consideration is to be given to structural details, reinforcement, etc., in areas subject to high local loadings indicated in the following (1) to (5) :
 - (1) Areas subject to ~~sea-bottom~~ seabed bearing loads, where applicable,
 - (2) Bulkheads of partially filled tanks,
 - (3) Areas liable to sustain external damages,
 - (4) Jointed parts between columns and footings or lower hulls,
 - (5) Areas subject to wave impact.
- 6 Where a unit is designed for operations while supported by the ~~sea-bottom~~ seabed, the effects of scouring are to be considered. The effects of skirt plates, where provided, are to be specially considered.

7.5.4 Bracing Members

Sub-paragraph -1 has been amended as follows.

1 Bracing members are to be designed to transmit loadings and to make the structure effective against environmental forces, and when the unit is supported by the ~~sea bottom seabed~~, against the possibility of uneven bearing loads.

(Sub-paragraphs -2 to -8 are omitted.)

Title of 7.6 has been amended as follows.

7.6 Ship-Type Units and Barge-Type Units

7.6.1 General

Sub-paragraph -1 has been amended as follows.

1 The hull structure of units fixed on the seabed or positioned for long periods of time is to be in accordance with the requirements in this Section taking account of the following (1) to (4). Where, however, approved by the Society, for the ship-type unit, the requirements in **Part C** or **Part CS** and for barge-type unit, the requirements in **Part Q** may apply, notwithstanding the requirements in **Chapter 3** and **7.1 to 7.3**.

- (1) Where large deck openings such as wells, etc. are provided, the hull structure is to be suitably reinforced and to be good in the continuity of longitudinal strength and transverse strength.
- (2) The plating of the well is to be suitably stiffened to prevent damage due to foreign objects which may become trapped in the well.
- (3) The unit's structure in way of heavy concentrated loads is to be suitably reinforced.
- (4) Local structures in way of fairleads, winches, etc., forming part of the position mooring system, are to be designed to the breaking strength of the mooring line or chain.

(Sub-paragraphs -2 to -4 are omitted.)

Paragraph 7.6.3 has been deleted.

~~7.6.3 Work Ships~~

~~1 Dredgers~~

~~The surroundings of ladder wells in dredgers are to be provided with cofferdams or suitably reinforced.~~

~~2 Floating Cranes~~

~~In calculating for the longitudinal strength of a barge-type work ship provided with cranes, when the cranes are in an operating condition, in case where a cross sectional coefficient of this unit are calculated, Z_2 which appears the wave bending moment in the formula in **Chapter 12, Part Q** may be taken as the followings.~~

$$~~Z_2 = 8.36CM_s (cm^3)~~$$

~~where:~~

~~All symbols are to be in accordance with the requirement in Chapter 12, Part Q.~~

Section 7.7 has been added as follows.

7.7 Additional Requirements for Work-Ships

7.7.1 Dredgers

The surroundings of the ladder wells in dredgers are to be provided with cofferdams or be suitably reinforced.

7.7.2 Crane Ships

With respect to the longitudinal strength of a barge-type work-ships provided with cranes, in cases where the cross sectional coefficient is calculated when such cranes are in operation, the value of Z_2 is to be according to Chapter 12, Part Q or calculated according to the following formula:

$$Z_2 = 8.36CM_s (cm^3)$$

where:

All symbols are to be in accordance with the requirements given in Chapter 12, Part Q.

7.7.3 Tugs and Pusher Tugs

1 The construction of parts, such as the bow parts of work-ships, in cases where work-ships come into contact with other units for navigation or operation of units, is to be such to ensure sufficient strength.

2 In cases where pusher tugs are equipped with coupling devices for connection to other units, construction in way of such coupling devices is to be such to ensure sufficient strength.

7.7.4 Vessels engaged in Towing Operations

1 In general, Towing equipment are to be located on longitudinals, beams or girders, which are parts of the deck construction.

2 In cases where towing equipment cannot be located as specified in -1 above, towing equipment are to be arranged on reinforced members.

3 The supporting structures of towing equipment are to be such to ensure sufficient strength.

4 The design load on fittings is to take into account all acting loads.

5 The design loads for the supporting structures of towing equipment are to be not less than the breaking strength of the towline system.

7.7.5 Fire Fighting Vessels

The supporting structures of monitors for fire fighting are to be such to ensure sufficient strength to handle the reaction forces of water jets.

7.7.6 Offshore Supply Vessels

1 Side construction is to be such to ensure sufficient strength for impact loads arising from contact with other ships.

2 In cases where cargo rails are fitted onto cargo decks, the structures under the stanchions of cargo rails are to be appropriately reinforced.

3 In cases where heavy cargo is carried on deck, effective means such as steel cradles, steel or wooden dunnages, etc. are to be provided so that weight is uniformly distributed onto deck structures.

4 The superstructure end bulkheads and boundary walls of deckhouses are to be such to ensure

sufficient strength for operational loads.

5 Liquid cargo tanks are to be according to following (1) to (3):

- (1) In cases where hazardous and noxious liquid cargo are loaded in tanks, the quantities of liquid cargo are to be limited to $800m^3$ or a volume in cubic meters equal to 40% of vessel deadweight calculated at a cargo density of $1.0t/m^3$. However, there are no such quantity limitations for drilling fluids (liquid mud, etc.), cargo fuel and non-noxious liquid substances.
- (2) In cases where not bounded by bottom shell plating, fuel oil tanks, cargo pump-rooms or pump-rooms, cargo integral tanks are to be separated from other spaces by cofferdams having accessible widths of 600mm.
- (3) Independent tanks are to be segregated from machinery spaces, propeller shaft tunnels, if fitted, dry cargo spaces, accommodation and service spaces and from drinking water and stores for human consumption by cofferdams, void spaces, cargo pump-rooms, oil fuel tanks or other similar spaces.

6 Dry cargo tanks are to be according to following (1) and (2):

- (1) In cases where cargo tanks for dry cement or mud are fitted, these cargo tanks are to be separated from engine rooms and accommodation spaces by steel bulkheads and decks.
- (2) Cargo transfer piping systems are, in general, not to be led through machinery spaces. However, in cases where such design is impractical, piping systems may pass through machinery spaces, provided that all pipe connections located within machinery spaces are welded and any detachable connections are arranged outside of such spaces.

7.7.7 Anchor Handling Vessels

1 The supporting structures of anchor handling equipments and in way of parts where anchors are loaded are to be such to ensure sufficient strength.

2 Units are to have completely clear after decks in order to effectively handle anchors.

3 In cases where anchor handling operations are conducted using after deck stern rollers, the aft terminals in way of the stern areas for shipping/unshipping anchors are to be round in shape.

7.7.8 Vessels engaged in Laying Objects on the Seabed

1 The supporting structures of equipment used for laying objects on the seabed are to be such to ensure sufficient strength.

2 The supporting structures of parts used for loading cable and pipes are to be such to ensure sufficient strength.

3 In cases where units are equipped with mooring equipment or anchor handling equipment for positioning consist, the supporting structures of such equipment are to be such to ensure sufficient strength.

Chapter 8 LOAD LINES

8.1 General

Paragraph 8.1.1 has been amended as follows.

8.1.1 Application

1 The requirements given in this Chapter 8.2 and 8.3 apply to the all units fixed on the seabed or positioned for long periods of time intended for international voyages or unrestricted services except units, L of which is less than 24 metres.

2 In units fixed on the seabed or positioned for long periods of time, except for the units specified in -1 above, not applied to this Chapter, marking of the load line is not necessary, however, designed maximum load line of these units are to be determined by the requirements in Chapter 4, 5, 7 and 8.2.

3 A fixed unit ~~to~~ on the ~~sea bottom~~ seabed for a long period semi-permanent is not to apply ~~to~~ the requirements of 8.2.

4 The load lines of ship-type and barge-type units, except for the units listed in -1 to -3 above, are to be according to requirements given in Part V.

5 The load lines of units, except for the units listed in -1 to -4 above, are to be at the discretion of the Society.

8.2 Load Lines

Paragraphs 8.2.2 and 8.2.4 have been amended as follows.

8.2.2 Self-Elevating Units

1 Freeboard of this unit is to be assigned in accordance with *ILLC* after confirming that the hull structure has a sufficient strength for the draught corresponding to the freeboard assigned. Freeboard of units which cannot be assigned in accordance with *ILLC* due to special forms of units, however, is to be assigned in accordance with the requirements in Chapters 4, 5 and 7 at floating condition.

2 Load lines corresponding to assigned freeboards are to be marked with in accordance with *ILLC*.

~~3 Where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool are not to be included in the calculation of any hydrostatic properties.~~

~~4 Where the moonpool has a larger cross sectional area above the waterline at $0.85 D$ than below, an addition is to be made to the geometric freeboard corresponding to the lost buoyancy. This addition for the excess portion above the waterline at $0.85 D$ are to be dealt with the following (1) to (3) as below for wells and recesses.~~

~~(1) Where an enclosed superstructure contains part of the moonpool, deduction are to be made for the effective length of the superstructure.~~

~~(2) Where open wells or recesses are arranged in the freeboard deck, a correction equal to the volume of the well or recess to the freeboard deck divided by the waterplane area at $0.85 D$ are to be made to the freeboard obtained after all other corrections, except bow high correction have been made.~~

~~(3) In stability calculation, free surface effects of the flooded well or recess are to be taken into consideration.~~

~~5~~ Where small notches or relatively narrow cut-outs at the stern of the unit, The same procedure for correction described in ~~4~~ is to be carried out.

~~6~~ Narrow wing extensions at the stern of the unit are to be considered as appendages.

8.2.4 Ship-Type Units and Barge-Type Units

1 Freeboard of this unit is to be assigned in accordance with *ILLC* after confirming that the hull structure has a sufficient strength for the draught corresponding to the freeboards assigned.

2 Load lines corresponding to assigned freeboards are to be marked with in accordance with *ILLC*.

~~3~~ Where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool are not to be included in the calculation of any hydrostatic properties.

~~4~~ Where the moonpool has a larger cross-sectional area above the waterline at $0.85 D$ than below, an addition is to be made to the geometric freeboard corresponding to the lost buoyancy. This addition for the excess portion above the waterline at $0.85 D$ are to be dealt with the following (1) to (3) as below for wells and recesses.

~~(1)~~ Where an enclosed superstructure contains part of the moonpool, deduction are to be made for the effective length of the superstructure.

~~(2)~~ Where open wells or recesses are arranged in the freeboard deck, a correction equal to the volume of the well or recess to the freeboard deck divided by the waterplane area at $0.85 D$ are to be made to the freeboard obtained after all other corrections, except bow high correction have been made.

~~(3)~~ In stability calculation, free surface effects of the flooded well or recess are to be taken into consideration.

~~5~~ Where small notches or relatively narrow cut-outs at the stern of the unit, The same procedure for correction described in ~~4~~ is to be carried out.

~~6~~ Narrow wing extensions at the stern of the unit are to be considered as appendages.

8.3 Vertical Distance between the Wave Crests and Underside of Deck Structure

8.3.2 Column Stabilized Units

Sub-paragraph -2 has been amended as follows.

1 (Omitted)

2 For on-sea bottom seabed modes of operation, clearances are to be in accordance with those specified in 8.3.1.

Chapter 9 HULL EQUIPMENT

9.2 Mooring Equipment for Temporary Mooring

9.2.1 General

Sub-paragraph -4 has been amended as follows.

(Sub-paragraphs -1 to -3 are omitted.)

4 Notwithstanding the requirements in **-1**, where units are provided with the mooring system excluding the anchor mooring system specified in **10.2.2(1)** and positioned or fixed at specific sea area for semi-permanent~~ly~~, mooring equipment for temporary mooring is to be as deemed appropriate by the Society.

9.2.2 Equipment Number

Sub-paragraph -1 has been amended as follows.

- 1 The equipment number is to be determined according to the requirements in **27.1.2, Part C** or **23.1.2, Part CS** for ship-type units and those in **19.1.3, Part Q** for barge-type units.
- 2 (Omitted)

Paragraph 9.2.4 has been amended as follows.

9.2.4 ~~Windlasses~~ Anchor handling equipments

Units, except the mobile offshore drilling units and for those moored for a long period of time or semi-permanent~~ly~~, are to be provided with windlasses having a sufficient hoisting capacity.

9.3 Guardrails and Bulwarks

9.3.1 General

Sub-paragraphs -1 and -4 have been amended as follows.

- 1 In general, ~~G~~guardrails or bulwarks are to be provided on all exposed decks in order to prevent falling. The height and arrangement of the guardrails or bulwarks are to be in accordance with the requirements specified in **Chapter 23, Part C**.
- 2 Regardless of the requirements in **-1**, suitable wirenets may be provided to the helicopter deck in nearly the same plane as the deck surface instead of the guardrails or bulwarks, if the guardrails or bulwarks will become hindrances to take-off and landing of helicopters.
- 3 Regardless of the requirements in **-1**, guardrails or bulwarks which interfere with the operation may be eliminated subject to the approval by the Society at the request of the Owner.

4 For contact with other ships and sea-based facilities, the unit is to be equipped with sufficient fenders.

9.4 Equipment for Special Purpose

Paragraph 9.4.1 has been amended as follows.

9.4.1 General

1 In cases where equipment and devices for the purposes of units are fitted, suitable measures are to be taken so that the safety of units is not impaired.

2 Cargo gear is to be at the discretion of the Society, ~~as well as in accordance with the Rules for the Construction and Survey of Cargo Handling Machinery and Gear.~~

Title of 9.4.3 has been amended as follows.

9.4.3 ~~Work Ships~~ Dredgers

Paragraphs 9.4.4 to 9.4.8 have been added as follows.

9.4.4 Fire Fighting Vessels

Fire Fighting vessels are to be fitted with fire fighting equipments for fire fighting on other ships and fitted with suitable equipments to ensure the safety of their own ship during fire fighting operations.

9.4.5 Offshore Supply Vessels

1 Logitudinal fenders are normally to be fitted on side shells in the deck areas where upper decks or forecastles decks are at full breadth.

2 Wooden sheathings, etc. are to be provided on cargo decks to appropriately protect steel deck plates from mechanical damage and/or scuffing.

3 In cases where cargo rails are fitted onto cargo decks, cargo rail stanchions are to be attached.

9.4.6 Anchor handling vessels

1 Deck areas for the collection and handling of anchors and associated equipment are to be protected by wooden sheathing, etc.. In cases where deemed appropriate by the Society, there is no need for protection by wooden sheathing.

2 Equipment, such as winches, for anchor handling operations are to be provided with suitable safety devices so that towing wires are able to be released or cut in times of emergency.

9.4.7 Vessels engaged in towing operations

1 The towing hooks, towing bits or towing bollards fitted onto ocean tugs is to be located as low as practicable, and close to, but abaft of, the center of gravity of the towing vessel in the expected towing condition.

2 Equipment, such as winches, for towing operations are to be provided with suitable safety devices so that towing wires are able to be released or cut in times of emergency.

9.4.8 Vessels engaged in laying objects on the seabed

Equipment for laying objects on the seabed are to be provided with suitable safety devices so that towing wires are able to be released or cut in times of emergency.

Chapter 10 POSITIONING SYSTEMS

10.1 General

Paragraphs 10.1.1 and 10.1.2 have been amended as follows.

10.1.1 Application

1 The requirements in this Chapter apply to positioning systems to be provided with units. The positioning system referred to here includes a mooring system or a dynamic positioning system for positioning a unit a specific location for a long period or semi-permanently, or a mooring system or a dynamic positioning system for positioning a unit engaged in specific work at a specific location for a long period or semi-permanently.

10.1.2 General

1 The mobile offshore drilling units, whose type is a column stabilized type, a ship-type or barge-type, are to be provided with the positioning system satisfied with the requirements in this Chapter. The units other than the mobile offshore drilling units, whose type is a column stabilized type, a ship-type or barge-type, are to be provided with the positioning system satisfied with the requirements in this Chapter as a rule.

2 (Omitted)

3 (Omitted)

10.2 Classification of Positioning Systems

Paragraph 10.2.2 has been amended as follows.

10.2.2 Classification of Mooring System

Mooring systems are to be classified into the following categories corresponding to the type.

(1) Anchor mooring systems

Anchor mooring systems are defined as those comprising anchors and sinkers laid to the ~~sea~~ ~~bottom~~ seabed, fairleaders, windlasses, winches and other mooring equipment provided at several parts of the hull, and mooring lines connecting them, and obtaining a mooring force mainly from the net weight of the catenary mooring lines (for those provided with intermediate buoys or intermediate sinkers, their net weight or buoyancy). Here, the term “mooring line” means an integration of chains, wire ropes, fibre ropes or their combination, connecting means such as shackles, or intermediate buoys or intermediate sinkers.

(2) Tension mooring systems

Tension mooring systems are defined as those comprising supporting members such as piles and sinkers laid to the ~~sea~~ ~~bottom~~ seabed, tension lines arranged upright direction, and connecting means to fix the tension mooring lines to the hull structure, and confining the unit's heaves, rolls and pitches by the increased buoyancy created by pulling the unit downward and the tension in the mooring line. Here, tension mooring lines include steel pipes, chains, steel wire ropes and fibre ropes, and they are arranged straight in a high tensile force which is mainly obtained from elastic elongation of these lines.

(3) Single-point mooring systems

In this system, mooring force is obtained only from a single point of a hull. The system comprises mooring equipment installed in the hull, connecting systems, one or more mooring lines, mooring construction instead of mooring lines, and supporting members laid to the ~~sea~~

~~bottom~~ seabed or provided in the fixtures in the vicinity.

(4) (Omitted)

(5) (Omitted)

10.3 Anchor Mooring System

10.3.1 General

Sub-paragraph -11 has been amended as follows.

(Sub-paragraphs -1 to -10 are omitted.)

11 Suitable anchor storage arrangements are to be provided to prevent from moving the anchors in a seaway. For units moored semi-permanently at a specific location, however, storage arrangements may be dispensed with.

12 (Omitted)

10.4 Tension Mooring System

10.4.3 Equipment for Tension Mooring Systems

Sub-paragraph -3 has been amended as follows.

1 (Omitted)

2 (Omitted)

3 Plans and documents showing that the supporting members laid to the ~~sea~~~~bottom~~ seabed are designed so that they cannot be pulled up under any design load condition are to be submitted to the Society for reference.

Chapter 11 MACHINERY INSTALLATIONS

11.1 General

11.1.4 General Requirements for Machinery Installations

Sub-paragraphs -2 and -3 have been amended as follows.

1 (Omitted)

2 Main propulsion machinery, prime movers for generators, and auxiliary machinery and the prime movers for it are to be designed to operate under the static conditions given below, as fitted in the unit. The Society may permit deviation from the angles given below taking into consideration the type, size and service conditions of the unit.

(1) For self-elevating units:

static inclination up to 10 *degrees* in any direction

(2) For column stabilized units:

static inclination up to 15 *degrees* in any direction

(3) For ship_type units and barge_type units:

list static inclination up to 15 *degrees* either way and simultaneously trim up to 5 *degrees* by the bow or stern

3 Prime movers for emergency generators are to be designed to function at full rated power when inclined up to the maximum angle of heel in the intact and damaged conditions as determined in accordance with **Chapter 4**. In no case need the equipment be designed to operate when inclined more than an angle listed below.

(1) For self-elevating units:

static inclination of 15 *degrees* in any direction

(2) For column stabilized units:

static inclination of 25 *degrees* in any direction

(3) For ship_type units and barge_type units:

list static inclination of 22.5 *degrees* either way and simultaneously trim of 10 *degrees* by the bow or stern

(Sub-paragraphs -4 to -10 are omitted.)

11.1.15 Additional Requirements for the Unit which has the Main Propulsion Machinery

Sub-paragraph -6 has been amended as follows.

(Sub-paragraphs -1 to -5 are omitted.)

6 Main propulsion machinery, prime movers for generators, and auxiliary machinery and the prime movers for it are to be designed to operate under the following dynamic conditions as well as the static conditions specified in **11.1.4-2** and **-3**. The Society may permit deviation from the angles given in the following taking into consideration the type, size and service conditions of the unit.

(1) For self-elevating units:

dynamic inclination up to 15 *degrees* in any direction

(2) For column stabilized units:

dynamic inclination up to 22.5 *degrees* in any direction

(3) For ship_type units and barge_type units:

rolling up to 22.5 degrees and simultaneously pitching up to 7.5 degrees by bow or stern

7 Special consideration is to be given to the design, construction and installation of the machinery installations so that any mode of vibrations shall not cause undue stresses in normal operating ranges.

Section 11.4 has been added as follows.

11.4 Fire Fighting Vessels

11.4.1 Scope

The machinery installations of fire fighting vessels are to comply with the requirements given in this 11.4 as well as the requirements given in 11.1.

11.4.2 Propulsion machinery

1 Propulsion machinery is to have sufficient power to secure stable maneuverability during fire fighting operations.

2 Propulsion machinery is to be able to maintain ship position in still water as well as the capacity of water monitors during fire fighting operations at not more than 80% of the propulsion force in any direction.

3 Control systems

Control systems are to be provided with the following functions to prevent complete loss of power due to power overloads:

(1) Alarm devices which give alarms in cases where propulsion power exceeds 80% during fire fighting operations.

(2) Means which reduce the speed of propulsion machinery in cases where propulsion power exceeds 100% during fire fighting operations.

11.4.3 Auxiliaries and Piping Systems

Pumps and piping systems intended for serving water monitors or water spray devices which are used for protection are to comply with the following requirements:

(1) Pumps and piping systems are not to be used for services other than water monitors and water spray devices.

(2) In cases where 2 or more pumps are provided, independent sea inlets are to be provided for each pump.

(3) In cases where 2 or more pumps are provided, they are to have equal or near equal capacity.

(4) Adequate piping arrangements to prevent overheating at low pump delivery rates are to be provided to each pump.

(5) Piping systems are to be protected against overpressure.

(6) Pumps and piping systems used for water spray devices are to be independent from systems serving water monitors, except in cases where such pumps are intended for serving water monitors and water spray devices.

(7) Piping systems are to be protected against corrosion and freezing.

11.4.4 Sea Inlets for Fire Fighting Operations

1 The sea inlets for fire fighting operations are not to be used for services other than fire fighting operations or water spray devices.

- 2 The sea inlets for fire fighting operations and sea chests are to be arranged as low as practical to avoid clogging due to debris or ice and oil intake from the sea surface.
- 3 The location of sea inlets for fire fighting operations and sea chests are to be such that water suction is not impeded by ship motions or the water flow from propellers or thrusters.
- 4 Each sea inlet for fire fighting operations is to be provided with a shut off valve.
- 5 Fire fighting pumps, the shut off valves mentioned above, and overboard discharge valves are to be operable from the same locations.
- 6 The starting of fire fighting pumps in cases where shut off valves are closed is to be prevented by providing either interlock systems or by audible and visual alarms.

Chapter 14 FIRE PROTECTION AND MEANS OF ESCAPE

14.1 General

Paragraph 14.1.1 has been amended as follows.

14.1.1 Application

1 The structural fire protection and means of escape provided ~~in the~~ for units fixed on the seabed or positioned for long periods of time are to be in accordance with the requirements given in this Chapter.

2 The structural fire protection and means of escape provided for ship-type or barge-type units, except for units fixed on the seabed or positioned for long periods of time, are to be according to 14.7, in addition to the requirements given in Part R.

3 The structural fire protection and means of escape provided for units, except for units listed in -1 and -2 above, are to be at the discretion of the Society.

4 The structural fire protection and means of escape provided for units are to be according to this Part. In addition, attention is to be paid to complying with the National Regulations of the flag state.

Section 14.7 has been added as follows.

14.7 Additional requirements for work-ships

14.7.1 Fire Fighting Vessels

1 In general, exposed decks, hulls and all exterior boundaries of forecastles and deck houses above the lightest operating waterline are to be made out of steel.

2 Special consideration is to be paid to boundaries which are to be constructed of materials other than steel.

3 In cases where water-spray systems are not provided to protect fire fighting vessels from the heat radiated from the fire, steel deadlights or shutters are to be provided on all windows and port lights, except for those in navigation bridges.

4 In cases where water-spray systems are not provided to protect fire fighting vessels from the heat radiated from the fire, such systems are to be according to the following (1) to (3):

(1) Water-spray systems are to provide suitable protection for all exterior boundaries including the boundaries of hulls, superstructures, and deck houses. In cases where deemed appropriate by the Society, this requirement may be dispensed with.

(2) Water-spray systems are to be protected from corrosion.

(3) Deck scuppers and freeing ports are to be appropriately provided to assure efficient drainage of water from deck surfaces in cases where water-spray systems are in operation.

14.7.2 Vessels engaged in towing operations

Emergency exits from machinery spaces to decks are to be capable of being used at extreme heel angles. In addition, emergency exits are to be positioned as high as possible above waterlines and positioned as near as practicable to ship centerlines.

Chapter 15 FIRE EXTINGUISHING SYSTEMS

15.1 General

Paragraph 15.1.1 has been amended as follows.

15.1.1 Application

1 The fire detection and extinguishing systems provided in the for units fixed on the seabed or positioned for long periods of time are to be applied to the requirements given in this Chapter.

2 The fire detection and extinguishing systems of ship-type or barge-type units, except for units fixed on the seabed or positioned for long periods of time, are to be according to **Part R**. In addition, when deemed necessary by the Society, additional requirements may be applied to work-ships depending on their purposes of operation.

3 The fire detection and extinguishing systems of units, except for units listed in -1 and -2 above, are to be at the discretion of the Society.

4 The fire detection and extinguishing systems of units are to be according to this **Part**. In addition, attention is to be paid to complying with the National Regulations of the flag state.

15.2.7 International Shore Connection

Sub-paragraph -1 has been amended as follows.

1 Ship-type, barge-type and column stabilized units are to be provided with the at least one international shore connection complying with **Chapter 22, Part R**.

2 Facilities are to be available enabling such a connection to be used on either side of the unit.

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 April 2010.
2. Notwithstanding the amendments to the Rules, the current requirements may apply to ships for which the date of contract for construction is before the effective date.
3. Notwithstanding the provision of preceding 2., the amendments to the Rules may apply to ships for which the application is submitted to the Society before the effective date upon request by the owner.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part P

**Mobile Offshore Drilling Units,
Work-ships and Special Purpose Barges**

GUIDANCE

2009 AMENDMENT NO.1

Notice No.62 30th October 2009

Resolved by Technical Committee on 24th June 2009 and 25th September 2009

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, WORK-SHIPS AND SPECIAL PURPOSE BARGES

Amendment 1-1

P1 GENERAL

P1.1 General

Paragraph P1.1.2 has been amended as follows.

P1.1.2 Consideration for Special Units

1 Among the vessels or offshore structures not primarily intended for the transport of cargoes, those which are positioned for a long periods of time or semi-permanently at a specific sea area of oil field, and also fitted with facilities of production, storage and offloading the crude oil/petroleum gases (hereinafter referred to as “crude oil, etc.”) drawn up from the seabed (hereinafter referred to as “FPSO”) are in principle to comply with the requirements specified in **Part PS of the Rules** ~~Part 1 of the “FPSO Guidelines”~~ with respects of hull construction, equipment, arrangement, scantlings, positioning systems, etc.

~~2~~ For the vessels (offshore structure, as well) approved in accordance with preceding ~~1~~, the notation of “Offshore Structure for Hydro-carbon Production, Storage, and Offloading” and “Designated Service Area” are affixed to the Classification Character. Specific area where the vessel is positioned is indicated as descriptive notes. In the case vessels not having either of, or any combination of production, storage, offloading systems, relevant systems are excluded from the notation.

~~3~~ It is considered as a prerequisite that the positioning system of FPSO are to be connected to the such periphery facilities for positioning that have the strength adequate for prospective load acting on the FPSO units under the circumstance of the site of operation, and fixed firmly at the seabed.

~~4~~ In connection with the provisions specified in **1.1.4, Part P of the “Rules for the survey and construction of steel ships”** (hereinafter referred to as “Rules”) and preceding ~~3 of the Guidelines~~, it is to be shown to the Society that the periphery facilities for positioning comply with the requirements of coastal state, the flag state, or its integrity is verified by the organization deemed appropriate by this Society. Alternatively, the verification for the compliance to the **Part 2 of the Guidelines** may acceptable for this purpose.

~~5~~ Among the periphery facilities for positioning, the floating structure independent of FPSO proper which is intended for classification under this Society (CALM-buoy, for example) is to be in compliance with **Part 2 of the Guidelines** in principle. For the floating structure classified according to the provisions, the notations of “Floating Structure for Mooring” and “Designated Service Area” are affixed to the Classification Character. Specific area where the structure is

positioned is indicated as descriptive notes.

~~6 Even though the structure is independent of the FPSO proper, such structure is to be recognized as a part of FPSO proper and treated accordingly that is linked permanently by rigid yoke, etc. For such structures, the relevant provisions specified in **Part 2 of the Guidelines** are applied to.~~

Appendix P2 has been deleted.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 30 October 2009.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to ships for which the date of contract for construction is before the effective date.

P1 GENERAL

P1.1 General

Paragraph P1.1.1 has been amended as follows.

P1.1.1 Application

~~Notations specified in 1.1.1-2, Part P of the Rules are as follows:~~

- ~~(1) Anchor mooring system defined in 10.2.2(1) Part P of the Rules : AM~~
- ~~(2) Tension mooring system defined in 10.2.2(2) Part P of the Rules : TM~~
- ~~(3) Single point mooring system defined in 10.2.2(3) Part P of the Rules : SPM~~
- ~~(4) Dolphin mooring system defined in 10.2.2(4) Part P of the Rules : DM~~
- ~~(5) Other mooring system defined in 10.2.2(5) Part P of the Rules : OM~~
- ~~(6) Class A DPS defined in 10.2.3-1(1) Part P of the Rules : DPS A~~
- ~~(7) Class B DPS defined in 10.2.3-1(2) Part P of the Rules : DPS B~~
- ~~(8) Class C DPS defined in 10.2.3-1(3) Part P of the Rules : DPS C~~

Integrated pusher tugs are to comply with relevant requirements given in Part P of the Rules as pusher tugs integrated with barges in addition to complying with relevant requirements given in Part P of the Rules as pusher tugs.

Paragraph P1.1.4 has been amended as follows.

P1.1.4 Record of Design Criteria

The design criteria recorded in the Register Book of units fixed on the seabed or positioned for long periods of time are ~~followings~~ as follows:

- (1) Planned service area (including the area intended to transit);
- (2) The maximum water depth at the planned service area;
- (3) The following design condition of the operating condition and severe storm condition at the service area:
 - (a) ~~The the~~ maximum wind velocity;
 - (b) Maximum ~~maximum~~ design wave height and significant wave height, and wave periods relating hereto;
 - (c) Current ~~current~~ and tidal current velocity; and
 - (d) Other ~~others~~ (e.g. icing, snowing); and
- (4) The the maximum and minimum design service temperature of air at the service area and the maximum and minimum temperature of sea water.

Paragraph P1.1.5 has been added as follows.

P1.1.5 Class Notations

1 With respect to units complying with relevant requirements given in this Part, notations corresponding to the purposes of those units defined in 1.2.3, Part P of the Rules are affixed to the Classification Characters as follows. In addition, for self-elevating units and column stabilized units,

notations corresponding to the type of the units defined in **1.2.2, Part P of the Rules**, are affixed before notation indicating the purpose of such units.

(1) Mobile offshore drilling units

- (a) Self elevating mobile offshore drilling units: *Self-Elevating Drilling Unit* (abbreviated to *SEDU*)
 - (b) Column stabilized mobile offshore drilling units: *Column-Stabilized Drilling Unit* (abbreviated to *CSDU*)
 - (c) Ship-type mobile offshore drilling units: *Drilling Vessel* (abbreviated to *DV*)
 - (d) Barge-type mobile offshore drilling units: *Drilling Barge* (abbreviated to *DB*)
- In addition, for units complying with “*The Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code)*” (*IMO Resolution A.649(16)*), the notation of “*Mobile offshore Drilling Unit*” (abbreviated to *MODU*) is affixed.

(2) Work-ships

- (a) Dredgers: *Dredger* (abbreviated to *D*)
- (b) Crane ships: *Crane Vessel* (abbreviated to *CV*)
- (c) Vessels engaged in towing operations
 - i) Tugs: *Tug*
 - ii) Ocean Tugs: *Towing Vessel*(abbreviated to *TV*)
- (d) Pusher tugs: *Pusher*
- (e) Fire fighting vessels

With respect to fire fighting vessels, the following notations corresponding to the installed fire fighting equipment defined in **P9.4.4-1** are affixed.

- i) FFV1 vessels: *Fire Fighting Vessel-Type 1* (abbreviated to *FFV1*)
- ii) FFV2 vessels: *Fire Fighting Vessel-Type 2* (abbreviated to *FFV2*)
- ii) FFV3 vessels: *Fire Fighting Vessel-Type 3* (abbreviated to *FFV3*)

In cases where the fire fighting equipment specified in **Table P1.1.5-1** is installed, additional descriptions can be affixed. (For example, *Fire Fighting Vessel-Type 1 equipped with WSS, MFG*)

In addition, if foam monitor systems for fire fighting complying with the requirements given in **P9.4.4-9** are installed, the following additional descriptions are affixed. (For example, *Fire Fighting Vessel-Type 3 equipped with WSS, FMS3*)

- i) *FMS1*: Have capacities of more than 1,000// minute
- ii) *FMS2*: Have capacities of more than 3,000// minute
- iii) *FMS3*: Have capacities of more than 6,000//minute
- iv) *FMS4*: Have capacities of more than 12,000 //minute
- v) *FMS5*: Two fixed low expansion foam monitors that have capacities more than 5,000 //minute

Table P1.1.5-1 Fire fighting equipment

<u>Fire fighting equipment</u>	<u>Additional descriptions</u>
<u>Water-spray system</u>	<u><i>WSS</i></u>
<u>Mobile high expansion foam generator</u>	<u><i>MFG</i></u>
<u>Foam monitor system</u>	<u><i>FMS</i></u>

- (f) Offshore supply vessels: *Offshore Supply Vessel* (abbreviated to *OSV*)
- (g) Anchor handling vessels: *Anchor Handling Vessel* (abbreviated to *AHV*)
- (h) Vessels engaged in laying objects on the seabed
 - i) Cable laying vessels: *Cable Layer* (abbreviated to *CL*)
 - ii) Pipe laying vessels: *Pipe Layer* (abbreviated to *PL*)

(i) Notations, except for those mentioned above, corresponding to work purposes of work-ships

In addition, in cases where the purpose of work-ships fall under more than one within the (a) to (i) mentioned above, notations corresponding to each purpose are affixed. (For example, Tugs-cum-Fire fighting vessels: *Tug/Fire Fighting Vessel-Type 1*)

(3) Storage units: *Storage Barge* (abbreviated to *SB*)

In cases where oil is stored, the notation to be affixed is “*Oil Storage Barge*”, and additional descriptions regarding flash points of oil are affixed. (For example, *Oil Storage Barge, Flash point below 60 °C*)

(4) Moored floating units: Notations corresponding to the purpose of such units are affixed. (For example, Hotel ships: *Floating Hotel* (abbreviated to *FH*))

(5) Plant barges: Notations corresponding to the types of installed industrial factories are affixed. (For example, Plant barges for generating electricity: *Power Plant Barge* (abbreviated to *PPB*))

(6) Accommodation barges: *Accommodation Barge*(abbreviated to *AB*)

2 The notations specified in **1.1.1-2, Part P of the Rules** are as follows:

(1) Anchor mooring system defined in **10.2.2(1) Part P of the Rules**: *AM*

(2) Tension mooring system defined in **10.2.2(2) Part P of the Rules**: *TM*

(3) Single point mooring system defined in **10.2.2(3) Part P of the Rules**: *SPM*

(4) Dolphin mooring system defined in **10.2.2(4) Part P of the Rules**: *DM*

(5) Other mooring system defined in **10.2.2(5) Part P of the Rules**: *OM*

(6) Class A DPS defined in **10.2.3-1(1) Part P of the Rules**: *DPS A*

(7) Class B DPS defined in **10.2.3-1(2) Part P of the Rules** : *DPS B*

(8) Class C DPS defined in **10.2.3-1(3) Part P of the Rules** : *DPS C*

P1.2 Definition

Paragraph P1.2.3 has been amended as follows.

P1.2.3 Purpose of Units

1 Storage units specified in **1.2.3(3), Part P of the Rules** are categorized as follows:

(1) Large sized storage units

Large sized storage units mean the units which are stationed at smooth water area and whose length is exceeding 350 m. However, one tank capacity of storage tank is not exceeding 100,000 m³.

(2) Other storage units

These units mean the units excluding preceding (1) and which are included that are also provided with production installation.

2 Pusher tugs defined in **1.2.3(2)(d), Part P of the Rules** are categorized into the following (1) or (2) according to the way they are connected to barges

(1) Easy separation type pusher tugs:

Connected by a pin and can be separated quickly and easily during an emergency.

(2) Unity type pusher barge:

Pusher tugs which are tightly connected to barges so that a single structure is formed. More specifically,

(a) Connection by a bolt and so on

(b) Has an uneven form structure so that they complement each other in the connecting part, and can be secured by wire ropes and so on after connection is made.

P7 STRENGTH OF HULL

Section P7.7 has been added as follows.

P7.7 Additional Requirements for Work-Ships

P7.7.6 Offshore Supply Vessels

1 The head of water for the calculation of the scantlings of structure end bulkheads and deckhouse boundary walls is not to be less than that obtained from **Table P7.7.6-1**.

Table P7.7.6-1

<u>Exposed front bulkhead and wall of the first tier</u>	<u>8.0(m)</u>
<u>Side walls, and aft bulkheads and walls</u>	<u>3.3(m)</u>

P8 has been added as follows.

P8 LOAD LINES

P8.2 Load Lines

P8.2.2 Self-Elevating Units

1 In the application of the regulations of *ILLC*, where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool is not to be included in the calculation of any hydrostatic properties. An addition is to be made to the geometric freeboard, if the moonpool has a cross-sectional area that is larger above the waterline at 0.85 of freeboard depth than below, corresponding to the lost buoyancy. This addition for the excess portion above 0.85 of freeboard depth is to be made as follows, as prescribed for recesses in regulation 32-1. If an enclosed superstructure contains part of the moonpool, a deduction should be made from the effective length of the superstructure.

(1) Where open wells or recesses are arranged in the freeboard deck, a correction equal to the volume of the well or recess to the freeboard deck divided by the waterplane area at 0.85 D are to be made to the freeboard obtained after all other corrections, except bow height correction have been made.

(2) In stability calculation, free surface effects of the flooded well or recess are to be taken into consideration.

2 Where small notches or relatively narrow cut-outs at the stern of the unit, The same procedure for correction described in -1 is to be carried out.

3 Narrow wing extensions at the stern of the unit are to be considered as appendages.

P8.2.4 Ship-Type Units and Barge-Type Units

1 Where a recess in the freeboard deck extends to both sides of the ship but is not in excess of 1 m in length, it is to be treated as a recess that does not extend to the sides of the ship for the application of regulation 32-1 of *ILLC*.

2 In the application of the regulations of *ILLC*, where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool is not to be included in the calculation of any hydrostatic properties. An addition is to be made to the geometric freeboard, if the moonpool has a cross-sectional area that is larger above the waterline at 0.85 of freeboard depth than below, corresponding to the lost buoyancy. This addition for the excess portion above 0.85 of freeboard depth is to be made as follows, as prescribed for recesses in regulation 32-1. If an enclosed superstructure contains part of the moonpool, a deduction should be made from the effective length of the superstructure.

(1) Where open wells or recesses are arranged in the freeboard deck, a correction equal to the volume of the well or recess to the freeboard deck divided by the waterplane area at 0.85 D are to be made to the freeboard obtained after all other corrections, except bow height correction have been made.

(2) In stability calculation, free surface effects of the flooded well or recess are to be taken into consideration.

3 Where small notches or relatively narrow cut-outs at the stern of the unit, The same procedure for correction described in -2 is to be carried out.

4 Narrow wing extensions at the stern of the unit are to be considered as appendages.

P9 has been added as follows.

P9 HULL EQUIPMENT

P9.3 Guardrails and Bulwarks

P9.3.1 General

1 In cases where, offshore supply vessels are fitted with fenders, such offshore supply vessels are to be according to following (1) and (2):

- (1) Fender materials are to be not less than steel required for Grade A materials.
- (2) Carling plates are to be arranged between the side frames bearing the fender loads.

P9.4 Equipment for Special Purpose

P9.4.4 Fire Fighting Vessels

1 Fire fighting vessels are to comply with P9.4.4 as either types specified in Table P9.4.4-1.

2 The fuel oil tanks of fire fighting vessels are to be capable of carrying sufficient fuel oil for fire fighting operations with all fixed water monitors in use at maximum and continuous propulsion operation during the operation time specified in Table P9.4.4-1.

3 Water monitors for fire fighting are to be according to following (1) to (5):

- (1) The range and height of trajectory of monitor jets are to be not less than those specified in Table P 9.4.4-1 with all fixed water monitors in use simultaneously.
- (2) Water monitors are to be capable of adequate adjustment in the vertical and horizontal directions.
- (3) Means are to be provided for preventing monitor jets from impinging on ship structure and equipment.
- (4) Water monitors are to be capable of being operated and maneuvered both locally and at a remote-control station. The water monitor remote-control station is to have adequate overall operational visibility and protection.
- (5) Control systems are to be suitably protected from external damage.

4 The pump capacity of water monitors is to be not less than that specified in Table P9.4.4-1.

5 Hoses and nozzles for fire fighting are to be according to following (1) to (3):

- (1) Each nozzle is to produce a jet or spray.
- (2) Hoses are to be not less than 38mm or more than 65mm in diameter, and generally are to be 15m in length.
- (3) A water jet flow of at least 12m is to be provided.

6 Fire-fighter's outfits are to be according to following (1) to (3):

- (1) Fire-fighter's outfits are to be according to 23.2.1, Part R of the Rules.
- (2) At least one set of fully charged spare air bottles is to be provided for each apparatus.
- (3) Means for fully recharging the air cylinders used in breathing apparatus in a time not exceeding 30 minutes free from contamination are to be suitably located.

7 Searchlights are to be capable of providing effective horizontal and vertical ranges of coverage.

8 In cases where additional mobile high expansion foam monitors are provided according to P1.1.5-1.(2)(e), each mobile high expansion foam monitor is to have a minimum capacity of 100m³/minute. In addition, total foam forming liquid carried is to be capable of a least 30 minutes foam production.

9 In cases where additional foam monitor systems for fire fighting are provided according to **P1.1.5-1.(2)(e)**, foam monitor systems are to be according to following **(1)** to **(3)**:

- (1)** Two fixed low expansion foam monitors are to be installed.
- (2)** The foam expansion ratio is not to be more than 15 to 1. In addition, the total foam forming liquid carried is to be capable of a least 30 *minutes* foam production
- (3)** A foam throw height of at least 50*m* above sea level with foam monitors in simultaneous use at maximum foam generation is to be provided.

Table P9.4.4-1 Minimum requirements for Fire Fighting Vessels

Type of Fire Fighting Vessels	FFV1	FFV2			FFV3	
Total pump capacity (m^3/h)	2,400	7,200			9,600	
Number of pumps ^{(1), (2)}	1	2			2	
Number of water monitors	2	2	3	4	3	4
Discharge rate per monitor (m^3/h) ⁽³⁾	1,200	3,600	2,400	1,800	3,200	2,400
Monitor range (<i>m</i>)	120	150			150	
Height of water jets of monitors (<i>m</i>) ⁽⁴⁾	45	70			70	
Number of hose connections on each side of vessel	4	8			8	
Number of fire-fighter's outfits	4	8			8	
Fuel oil capacity (<i>hours</i>)	24	96			96	
Number of search lights	2	2			2	

(Notes)

- (1)** Pumps used for extinguishing fires onboard a vessel may be used for fire fighting other vessels.
- (2)** It is recommended that fire pump suction velocity generally not exceed 2*m/sec*, discharge piping to water monitors generally not exceed 4*m/sec* operational velocity to assure adequate system capacity.
- (3)** Provided that total discharge capacity of water monitors installed on FFV2 or FFV3 fire fighting vessels is equal to total pump capacity, the discharge rate per monitor may be less than that specified in the above Table. However, in all cases, the discharge rate per monitor of each monitor is to be more than 1,800*m³/h*.
- (4)** The range of water jets is to be horizontally more than 70*m* from the nearest part of the fire fighting vessel. The height of water jets from sea level are to be vertically more than that specified in the above table.

P9.4.5 Offshore Supply Vessels

- 1** The thickness of wooden sheathing is to be at least 50*mm*.
- 2** The section moduli of cargo rails and stanchions are to be not less than that required by the following equation:

$$\text{Stanchion: } \frac{7.8CbHSh}{cm^3}$$

$$\text{Cargo rail: } \frac{7.8CbHSh^2}{cm^3}$$

C : 1.3 for stanchion, and 0.11 for cargo rail

b : breath of cargo deck, between cargo rails (*m*)

H : mean height of cargo (*m*)

S : spacing of cargo rail stanchion (*m*)

h : height of cargo rail (*m*)

P9.4.6 Anchor Handling Vessels

- 1** Cases "deemed appropriately by the Society" refer to those where the plate thickness is increased by 2.5*mm*.

P9.4.7 Vessels engaged in towing operations

- 1** The breaking strength of towlines is to be the maximum design towline force times at least 2.5.

P10 POSITIONING SYSTEMS

P10.2 Classification of Positioning Systems

Paragraph P10.2.2 has been amended as follows.

P10.2.2 Classification of Mooring Systems

1 Any anchor mooring system except sinkers in the ~~sea-bottom~~ seabed are to be regarded as positioning systems to be provided in units. In this case, however, the documents which are shown that sinkers are designed not to move in any severe conditions assumed at the design stage are to be submitted to the Society for reference.

2 (Omitted)

3 Any tension mooring systems except those supporting members embedded on the ~~sea-bottom~~ seabed are to be regarded as positioning systems to be provided in units. In this case, however, the documents which are shown that those supporting systems are designed not to move in any severe conditions assumed at the design stage are to be submitted to the Society for reference.

4 (Omitted)

5 Any single point mooring system provided for mooring units and directly moor the units with supporting members embedded on the ~~sea-bottom~~ seabed or fixtures at sea are to be regarded as positioning system to be provided in the units except those supporting systems embedded on the ~~sea-bottom~~ seabed. Any single point mooring system provided in a distance from the unit and serve to moor the unit indirectly with a mooring rope, etc., may not be regarded as positioning systems to be provided in units.

(Sub-paragraphs -6 to -8 are omitted.)

P11 MACHINERY INSTALLATIONS

Section 11.4 has been added as follows.

P11.4 Fire Fighting Vessels

P11.4.4 Sea Inlets for fire fighting operations

The “shut off valves” specified in 11.4.4-4 to -6, Part P of the Rules may be also used as sea valves.

P14 has been added as follows.

P14 FIRE PROTECTION AND MEANS OF ESCAPE

P14.7 Work-Ships

P14.7.1 Fire Fighting Vessels

1 Water-spraying systems are to have a capacity of $10l/minute/m^2$ for protected areas of uninsulated steel and $5l/minute/m^2$ for protected areas which are insulated internally to A-60 standards.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

- 1.** The effective date of the amendments is 1 April 2010.
- 2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to ships for which the date of contract for construction is before the effective date.
- 3.** Notwithstanding the provision of preceding 2., the amendments to the Guidance may apply to ships for which the application is submitted to the Society before the effective date upon request by the owner.