# RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

## Part C Hull Construction and Equipment

**2015 AMENDMENT NO.2**

Rule No.30 8th May 2015

Resolved by Technical Committee on 2nd February 2015

Approved by Board of Directors on 23rd February 2015

Rule No.30 8th May 2015
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 C HULL CONSTRUCTION AND EQUIPMENT

Amendment 2-1

## Chapter 6 DOUBLE BOTTOMS

### 6.1 General

### 6.1.1 Application

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

**1** Ships are to be provided with watertight double bottoms extending from the collision bulkhead to the after peak bulkhead. The longitudinal system of framing is, in general, to be adopted. The inner bottom is to be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge, and is not lower at any part than a plane parallel with the keel line and which is located not less than a vertical distance *h* (*m*) measured from the keel line specified in **2.1.47, Part A of the Rules**.

$h = B'/20$

$B'$ : It is specified in **4.1.2(11)**.

However, in no case is the value of h to be less than 0.76*m*, and need not be taken as more than 2.0*m*.

**2** Part or all of double bottoms may be omitted for ~~ships less than 500 *gross tonnage*; ships not engaged in international voyages that are less than 100*m* in length; or~~ ships ~~that are~~ deemed by the Society to not require a double bottom <u>for special reasons</u> ~~due to factors such as structural configuration, hull form, or purpose~~ <u>and for ships deemed appropriate by the Society which are less than 500 *gross tonnage* or which are not engaged in international voyages and less than 100*m* in length</u>.

**3** <u>For ships other than ships specified in **-2** above, d</u>~~D~~ouble bottoms may be omitted in way of watertight tanks~~, including dry tanks of moderate size subject to~~ <u>on the condition that</u> the safety of the ship is not impaired in the event of bottom or side damage.

(-4 to -7 are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

**1.** The effective date of the amendments is 8 May 2015.

**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.

**3.** Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to ships for which the date of contract for construction is before the effective date upon request by the owner.

Amendment 2-2

# Chapter 6 DOUBLE BOTTOMS

## 6.1 General

Paragraph 6.1.3 has been amended as follows.

### 6.1.3 Drainage

**1** Efficient arrangements are to be provided for draining water from the tank top.

**2** ~~With the exception of the after tunnel well, where bilge wells are provided for water drainage,~~ Regarding the application of **-1** above, small wells may be constructed in the double bottom in connection with drainage arrangements of holds. Such wells are not to extend downward more than necessary. In addition, such wells are not to extend for more than one-half the depth of the double bottom as far as practicable. ~~In addition, they are not to come within 460*mm* of the bottom shell. However, where bilge tanks deemed appropriate by the Society are provided instead of bilge wells, this requirement may be waived.~~ However, a well extending to the outer bottom is permitted at the after end of the shaft tunnel.

**3** Other wells (e.g. for lubricating oil under main engines) may be permitted by the Society if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Chapter.

**4** For wells specified in **-2** and **-3** above, except those at the ends of shaft tunnels, the vertical distance from the bottom of such a well to a plane coinciding with the keel line specified in **2.1.47, Part A of the Rules** is not to be less than 0.5*m*. This requirement may be waived, however, where bilge tanks deemed appropriate by the Society are provided instead of wells for the purpose of complying with **-1** above or where it is ascertained that the ship meets the requirements for the ommison of double bottoms given in **6.1.1-2** or **6.1.1-3**.

Paragraph 6.1.8 has been deleted, and paragraphs 6.1.9 and 6.1.10 have been renumbered to paragraphs 6.1.8 and 6.1.9.

~~**6.1.8 Wells**~~

~~**1** Small wells constructed in the double bottom in connection with drainage arrangements of holds are not to extend downward more than necessary. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel.~~

~~**2** Other wells (e.g. for lubricating oil under main engines) may be permitted by the Society if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Chapter.~~

~~**3** For wells specified in **-1** and **-2** above except a well at the end of the shaft tunnel, the vertical distance from the bottom of such a well to a plane coinciding with the keel line specified in **2.1.47, Part A of the Rules** is not to be less than 0.5*m*.~~

### 6.1.~~9~~8 Continuity of Strength

Where the longitudinal system of framing is transformed into the transverse system, or the depth of the double bottom changes suddenly, special care is to be taken for the continuity of strength by means of additional intercostal girders or floors.

**6.1.~~10~~9 Minimum Thickness**

No structural member of the double bottom construction is to be less than 6*mm* in thickness.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

**1.** The effective date of the amendments is 8 May 2015.

**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.

Amendment 2-3

# Chapter 1 GENERAL

## 1.1 General

### 1.1.7 Materials

Sub-paragraph -3 has been amended as follows.

**3** Where stainless steel or stainless clad steel specified in **Chapter 3, Part K of the Rules** is used for the main hull structure, use of the materials and their scantlings are to be subject to the following.

(1) The section modulus of the transverse section of the hull is not to be less than the value obtained by multiplying the following coefficient (*K*) with the value specified in **Chapter 15**. However, the coefficient (*K*) is to be rounded to three decimal places and not less than 0.63 ~~0.72~~.

$K = f_T\{8.81(\sigma_y/1000)^2 - 7.56(\sigma_y/1000) + 2.29\}$ for $\sigma_y \le 355$ (*N/mm*$^2$)

$K = f_T\, f_C(235/\sigma_y)$ for stainless steel with $\sigma_y > 355$ (*N/mm*$^2$)

Where

$f_C$ : Determined as follows:

$$f_C = 3.04(\sigma_y/1000)^2 - 1.09(\sigma_y/1000) + 1.09$$

$\sigma_y$ : The minimum value of yield strength or proof stress of stainless steel or stainless clad steel specified in **Chapter 3, Part K of the Rules** (*N/mm*$^2$)

$f_T$ : Determined as follows ~~To be given by the following formula~~:

$$f_T = 0.0025(T - 60) + 1.00$$

If *T* is more than 100°C, the value is at the discretion of the Society.

*T* : The maximum temperature in (°C) of cargo in contact with the materials. If the temperature is less than 60°C, *T* is to be taken as 60°C.

(2) Where the materials used have effective resistance against corrosion from cargoes carried, the scantlings required by the relevant requirements may be reduced as deemed appropriate by the Society.

(3) Notwithstanding the requirements in **(1)** above, 0.78 is to be used as the lower limit of the coefficient (*K*) when determining the construction and scantlings for areas of anticipated stress concentration, except where deemed appropriate by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

**1.** The effective date of the amendments is 8 November 2015.

**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.

# GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

## Part C Hull Construction and Equipment

**2015 AMENDMENT NO.2**

Notice No.33 8th May 2015

Resolved by Technical Committee on 2nd February 2015

Notice No.33 8th May 2015
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 C HULL CONSTRUCTION AND EQUIPMENT

Amendment 2-1

## C6 DOUBLE BOTTOMS

### C6.1 General

### C6.1.1 Application

Sub-Paragraphs -1 to -3 have been amended as follows.

**1** "Ships ~~that are~~ deemed by the Society to not require a double bottom for special reasons" stipulated in **6.1.1-2, Part C** of the Rules refer to the following.
(1) Ships complying with **Part N** or **Part S** of the Rules
(2) Ships complying with **3.2.2**, **Part 3 of the** "**Rules for Marine Pollution Prevention Systems**"
~~(3) Ships judged by the Society to be safe having a single bottom construction in holds that exclusively carry liquids~~
~~(4) Ships having one well extending beyond the outer bottom at the end of the shaft tunnel~~
**2** "Deemed appropriate by the Society" stipulated ~~The whole or partial omission of the double bottom according to the requirements~~ in **6.1.1-2, Part C** of the Rules ~~is only permitted where~~ refers to cases where the safety of the ship can~~has~~ be~~en~~ ascertained ~~by~~through flooding calculations.
**3** Application of requirements related to ~~for~~ the omission of double bottoms or unusual bottom arrangements in~~given by requirements of 4.2.3-2 or 4.2.3-3~~ **6.1.1-3, Part C** of the Rules is to be in accordance with following **(1)** and **(2)**.
(1) When it is assumed that such spaces are subject to a bottom damage, compartments are to be arranged to demonstrate that the factor $s_i$, when calculated in accordance with **4.2.3, Part C** of the Rules, is not less than 1 for those service conditions which are the three loading conditions used to calculate the Attained Subdivision Index (*A*) specified in **4.2.1-1, Part C** of the Rules. Assumed extent of damage is to be in accordance with following **Table C6.1.1-1**. If any damage of a lesser extent than the maximum damage specified in **Table C6.1.1-1** would result in a more severe condition, such damage is to be considered.
(2) Flooding of such spaces is not to render emergency power and lighting, internal communication, signals or other emergency devices inoperable in other parts of the ship.
(-4 to -7 are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

**1.** The effective date of the amendments is 8 May 2015.

**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.

**3.** Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to ships for which the date of contract for construction is before the effective date upon request by the owner.

Amendment 2-2

# C6 DOUBLE BOTTOMS

## C6.1 General

Paragraph C6.1.9 has been renumbered to Paragraph C6.1.8.

### C6.1.~~9~~8 Continuity of Strength

Where the height of adjacent double bottoms are different, it is recommended to keep the continuity of strength either by using a slope to gradually annul the height difference or by extending the lower of the two bottoms and have it overlapped by the other.

# Appendix C6 PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR CARGO OIL TANKS (Resolution MSC.288(87) and IACS Unified Interpretations SC259)

2 has been amended as follows.

## 2 DEFINITIONS

For the purpose of this Standard, the following definitions apply:

(2.1 to 2.5 are omitted.)

2.6 "*GOOD*" *condition* is the condition with minor spot rusting as defined in resolution *A*.1049(27) (2011 *ESP* Code) for assessing the ballast tank coatings for tankers.

(2.7 to 2.13 are omitted.)

**********

**Interpretation**

*GOOD*: Condition with spot rusting on less than ~~5~~3% of the area under consideration without visible failure of the coating, or no-perforated blistering. Breakdown at edges or welds should be less than 20% of edges or weld lines in the area under consideration.

*Coating Technical File*: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC-COT **3.4**.

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**Interpretation regarding Table 1**

**1 Design of coating system**

**1.3 Coating pre-qualification test**

**Method B: 5 years field exposure**

1.9 has been amended as follows.

1.9 All ~~ballast~~cargo oil tanks shall be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior 5 years.

1.9.1 "Good" is defined as: Condition with spot rusting on less than ~~5~~3% of the area under consideration without visible failure of the coating, or no perforated blistering. Breakdown at edges or welds should be less than 20% of edges or welds in the area under consideration.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

**1.** The effective date of the amendments is 8 May 2015.

**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.

Amendment 2-3

# C35 MEANS OF ACCESS

## C35.2 Special Requirements for Oil Tankers and Bulk Carriers

Paragraph C35.2.3 has been amended as follows.

### C35.2.3 Means of Access to Spaces

(-1 and -2 are omitted.)

**3** With respect to the provisions of **35.2.3-2, Part C** of the Rules, the wording "not intended for the carriage of oil or hazardous cargoes" applies only to "similar compartments", and access may be from pump-rooms, deep cofferdams, pipe tunnels, cargo holds and double hull spaces.

**4** "Deck" specified in **35.2.3-3, Part C** of the Rules means "weather deck".

~~**3**~~**5** With respect to the provisions of **35.2.3-4, Part C** of the Rules, where deemed necessary for aligning resting platform arrangements with hull structures, the vertical distance from the deck to a platform, between such platforms, or a platform and the tank bottom may be not more than 6.6 *m*.

# Annex C35.2.4 GUIDANCE FOR DECISION OF ALTERNATIVE MEANS OF ACCESS

## 2 Alternative Means of Access

### 2.7 Portable Ladders

### 2.7.2 Safety Routines

Sub-paragraph -1(2) has been amended as follows.

**1** Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

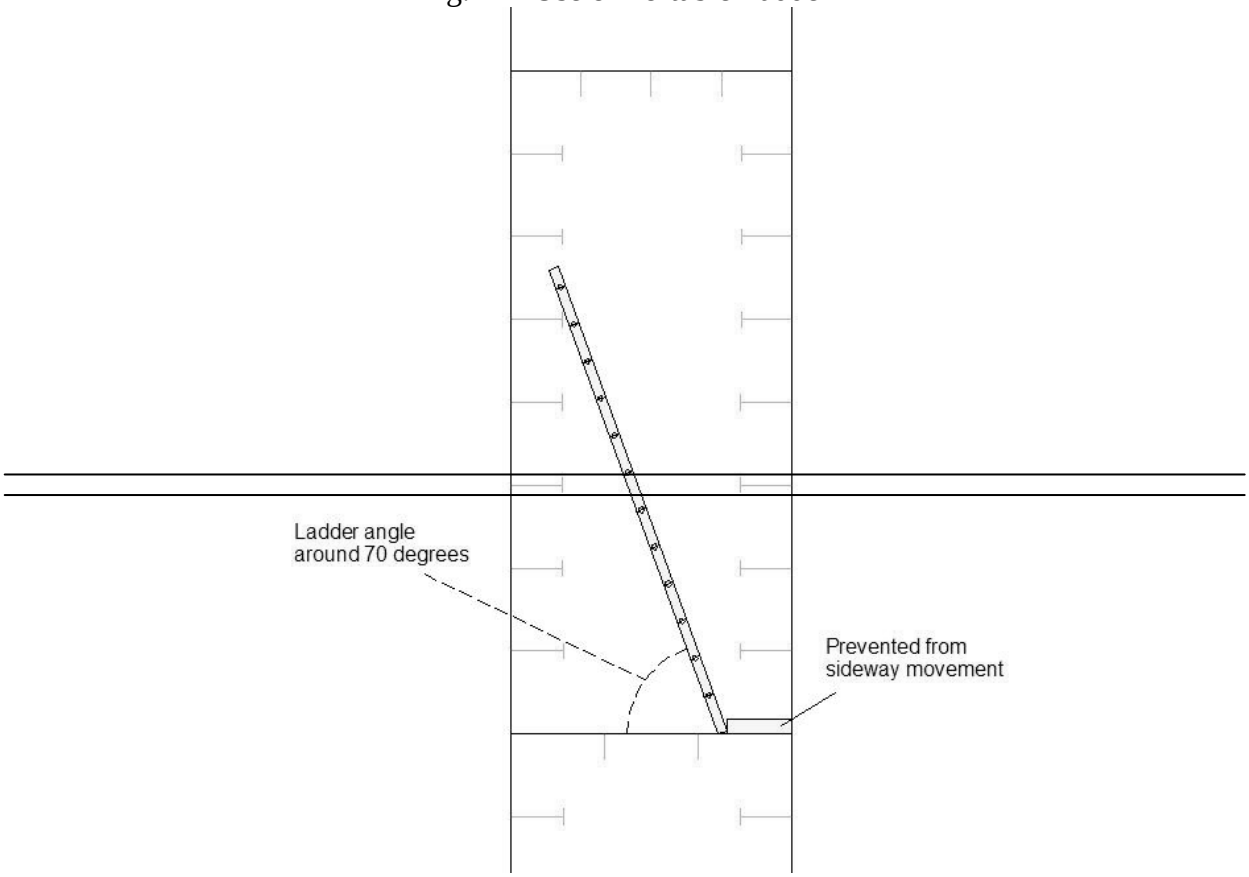
((1) is omitted.)

(2) The feet of portable ladders should be prevented from slipping during use by securing the stiles at or near their upper and lower ends, by any anti-slip device or by other arrangements of equivalent effectiveness. Unless specified in the specifications of each portable ladder or relevant safety standards, the ladder should be raised at an angle of around 70 *degrees* to the horizontal. ~~(Refer to **Fig.2**)~~

((3) to (6) are omitted.)

Fig.2 has been deleted.

~~Fig.2 Use of Portable Ladder~~



## EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

**1.** The effective date of the amendments is 1 July 2015.

**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.

* "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.

Amendment 2-4

# C1 GENERAL

## C1.1 General

Paragraph C1.1.7 has been amended as follows.

### C1.1.7 Materials

(-1 and -2 are omitted.)

**3** When the requirements in **1.1.7-2(3), Part C of the Rules** are applied, data corresponding to the standard of steels used (e.g., extent of use, location of structural members, section rigidity, buckling strength, minimum thickness, etc.) is to be submitted to the Society for approval when deemed necessary.

**4~~3~~** The requirements of **1.1.7-3(2)**, **Part C of the Rules** apply to members which do not come in contact with sea water, and the values in **(1)** and **(2)** may be deducted from the scantlings required by relevant requirements.

(1) For stainless steel
  (a) Where the scantling is determined by the thickness of the plate: 1.0 *mm*
  (b) Where the scantling is determined by the section modulus: 5%

(2) For stainless clad steel

Where the scantling is determined by the thickness of plate: 0.5*mm*

**5** "Areas of anticipated stress concentration" specified in **1.1.7-3(3) Part C of the Rules** refers to, for example, the connections of the lower corner parts of corrugated bulkheads and inner bottom plates or the top plate of the lower stools, the connections of inner bottom plates and bilge hopper plates or lower stools, etc.

**6** "Where deemed appropriate by the Society" specified in **1.1.7-3(3) Part C of the Rules** refers to cases such as where fatigue strength assessments based upon hot spot stresses obtained using the finite element method are carried out and the results are submitted to the Society for approval.

**7~~4~~** Where aluminium alloys specified in **Chapter 8, Part K of the Rules** are used for the main hull structure, data corresponding to the standard of the materials used (extent of their use, location of structural members, section rigidity, fatigue strength, weldability, corrosion protection, etc.) is to be submitted to the Society and approved. However, aluminium alloys whose material grade is 6005*AS*, 6061*P*, or 6061*S*, or is an alloy that does not have suitable anti-corrosion characteristics as deemed by the Society are not to be used for parts likely to come into contact with sea water during normal operation, unless approved otherwise by the Society.

**8~~5~~** In cases where it has been deemed appropriate by the Society, fiber reinforced plastic (FRP) may be used for equipment specified in this Part. In this case, such usage is subject to the requirements given in **Annex C1.1.7-5 "Guidance for the Use of Fiber Reinforced Plastic (FRP)"**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

**1.** The effective date of the amendments is 8 November 2015.

**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.