RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part C Hull Construction and Equipment

2016 AMENDMENT NO.2

Rule No.82 27th December 2016

Resolved by Technical Committee on 27th July 2016

Approved by Board of Directors on 20th September 2016

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

Rule No.82 27th December 2016
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 1 GENERAL

1.1 General

Remarks of Table C1.1 have been amended as follows.

Table C1.1 Application of Mild Steels for Various Structural Members

Structural member	Application		Thickness of plate : t (*mm*)					
			$t \leq 15$	$15 < t \leq 20$	$20 < t \leq 25$	$25 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 50$
Shell Plating								
Sheer strake at strength deck	within0.4L amidship	$L_1 \leq 250$	A^{*1*4}	B	D		E	
		$L_1 > 250$	E					
	within 0.6L amidship excluding the above		A^{*1*4}		B	D		E
	other than those mentioned above		A^{*1*4}				B	D
Side plating	within 0.4L amidship	within 0.1D downward from the lower surface of strength deck	A^{*1*4}		B	D		E
		other than those mentioned above	A^{*1*4}				B	D
Bilge strake	within 0.4L amidship	$L_1 > 250$	D				E	
		ships of $150 \leq L_1 \leq 250$, having double bottom structures and ships having single bottom structures	A^{*1*4}	B	D		E	
	within 0.6L amidship excluding the above		A^{*1*4}		B	D		E
	other than those mentioned above		A^{*1*4}				B	D
Bottom plating including keel plate	within 0.4L amidship		A		B	D		E
(Omitted)								
Other								
Other members than those mentioned above (including stiffeners)			A^{*1*4}					

Remarks:

1. For ships with length of L_1 exceeding 150m and single strength deck, single side strakes for ships without inner continuous longitudinal bulkhead(s) between bottom and the strength deck within cargo region are not to be less than grade *KB* as defined in **Part K of the Rules**.
2. For ships with length of L_1 exceeding 150m and single strength deck, longitudinal strength members of strength deck plating

within 0.4*L* amidship are not to be less than grade *KB* as defined in **Part K of the Rules**.

3. For ships with length of L_1 exceeding 150*m* and single strength deck, continuous longitudinal plating of strength members above strength deck within 0.4*L* amidship are not to be less than grade *KB* as defined in **Part K of the Rules**.
4. For ships with ice strengthening conforming to **Chapter ~~5~~8**, **Part I of the Rules**, shell strakes in way of ice strengthening area for plates are not to be less than grade *KB* as defined in **Part K of the Rules**.

(Omitted)

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2017.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships the keels of which were laid or which were at *a similar stage of construction* before the effective date except for in cases where the amendments are to be retroactively applied.
(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

Amendment 2-2

Chapter 6 DOUBLE BOTTOMS

6.1 General

6.1.1 Application*

Sub-paragraph -1 has 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 **2.1.4~~7~~8, 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 0.76m, and need not be taken as more than 2.0m.

6.1.3 Drainage*

Sub-paragraph -4 has been amended as follows.

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 **2.1.4~~7~~8, 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 omission of double bottoms given in **6.1.1-2** or **6.1.1-3**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2017.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships other than ships that fall under the following:

(1) for which the building contract is placed on or after the effective date; or

(2) in the absence of a building contract, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2017; or

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

(3) the delivery of which is on or after 1 January 2021.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Rules apply to the ships that fall under the following:

(1) which convert to using low-flashpoint fuels on or after the effective date; or

(2) which, on or after the effective date, undertake to use low-flashpoint fuels different from those which it was originally approved to use before the effective date.

Amendment 2-3

Chapter 23 BULWARKS, GUARDRAILS, FREEING ARRANGEMENTS, CARGO PORTS AND OTHER SIMILAR OPENINGS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND GANGWAYS

23.6 Ventilators

Paragraph 23.6.7 has been amended as follows.

23.6.7 Ventilators for Emergency Generator Room*

The coamings of ventilators supplying the emergency generator room is to extend to more than 4.5*m* above the surface of the deck in Position I, and more than 2.3*m* above the surface of the deck in Position II specified in **20.1.2**. The ventilator openings are not to be fitted with weathertight closing appliances, except for those complying with **1.3.5-2, Part D**. However, where due to vessel size and arrangement this requirement is not practicable, the height of ventilator coamings is to be at the discretion of the Society.

Chapter 32 CONTAINER CARRIERS

32.13 Special Requirements for Container Carriers Applying Extremely Thick Steel Plates

32.13.2 Application

Sub-paragraph -2 has been amended as follows.

2 Notwithstanding the requirement given in **-1** above, when as-built thickness of the hatch side coaming (includ~~es~~ing top plat~~es~~ing ~~and longitudinal stiffeners~~) is not greater than 50*mm*, this section may not be necessarily applied regardless of the thickness and grade of steel of the strength deck.

Paragraph 32.13.3 has been amended as follows.

32.13.3 Measures for Prevention of Brittle Fracture*

Measures for prevention of brittle fracture applying to extremely thick steel plates are to be utilized the combination shown in **Table C32.27** according to the thickness and grade of steel of the hatch side coaming (including top plating).

Table C32.27 has been amended as follows.

Table C32.27 Application of measures for prevention of brittle fractures

Hatch side coaming (including top plating)		Non-destructive inspection during ship construction specified in **1.4.2-1(3), Part M of the Rules**	Brittle crack arrest design specified in **32.13.4**
Grade of steel	Thickness(*mm*)		
*KA*36 *KD*36 *KE*36	$50 < t \leq 100$	X	N.A.
*KA*40 *KD*40 *KE*40	$50 < t \leq 85$		
	$85 < t \leq 100$	X	X(1)
*KE*47 (where electro-gas welding is applied at block-to-block butt joints)	$50 < t \leq 100$	X	X
*KE*47 (where welding procedures other than electro-gas welding are applied at block-to-block butt joints)	$50 < t \leq 100$	X	X(1)

(SYMBOL)
X : To be applied
N.A. : Need not to be applied
(1) : Other measures deemed by the Society to be equivalent in effectiveness to brittle crack arrest designs may be accepted.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2017.

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.

* "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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part C Hull Construction and Equipment

2016 AMENDMENT NO.2

Notice No.83 27th December 2016

Resolved by Technical Committee on 27th July 2016

Notice No.83 27th December 2016
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

C32 CONTAINER CARRIERS

C32.9 Direct Strength Calculations for Primary Structural Members

Paragraph C32.9.8 has been amended as follows.

C32.9.8 Yield Strength Assessment

1 In the application of **32.9.8, Part C of the Rules**, when fine mesh is used rather than the standard mesh given in **C32.9.7-3**, the mean stress corresponding to the standard mesh may be used.

2 The "deemed appropriate by the Society" specified in **32.9.8-2, Part C of the Rules** means calculating the shear stress and the stress in the spanwise direction of girder in consideration of the effective shear area of the web. The effective shear area of the web is to be taken as the web area deducting the area lost due to openings in accordance with the following **(1)** and **(2)**:

(1) When both sides of the web are plate members, the equivalent stress σ_{eq_cor} is to be calculated with the shear stress modified in accordance with following formula:

$$\sigma_{eq\_cor} = \sqrt{\sigma_{elem\_s}{}^2 - \sigma_{elem\_s} \cdot \sigma_{elem\_d} + \sigma_{elem\_d}{}^2 + 3\tau_{cor}{}^2}$$

τ_{cor} : Corrected element shear stress, in N/mm^2, to be taken as follows:

$$\tau_{cor} = \frac{ht_{mod-n50}}{A_{shr-n50}} \tau_{elem}$$

τ_{elem} : Element shear stress (N/mm^2) before correction.

$t_{mod-n50}$: Modelled web thickness (mm) in way of the opening.

h: Height of web of girder (mm) in way of the opening.

$A_{shr-n50}$: Effective net shear area of web (mm^2) taken as the web area deducting the area lost due to openings calculated with an effective web height h_{eff} (mm). h_{eff} ~~, which~~ is to be taken as the lesser of the following, where the third formula is only taken into account for an opening located at a distance less than $h_w/3$ from the cross-section considered. ~~:~~

$h_{eff} = h_w$

$h_{eff} = h_{w3} + h_{w4}$

$h_{eff} = h_{w1} + h_{w2} + h_{w4}$

h_w : Web height of primary supporting member (*mm*).

$h_{w1}, h_{w2}, h_{w3}, h_{w4}$: Dimensions shown in **Fig. C32.9.8-1**.

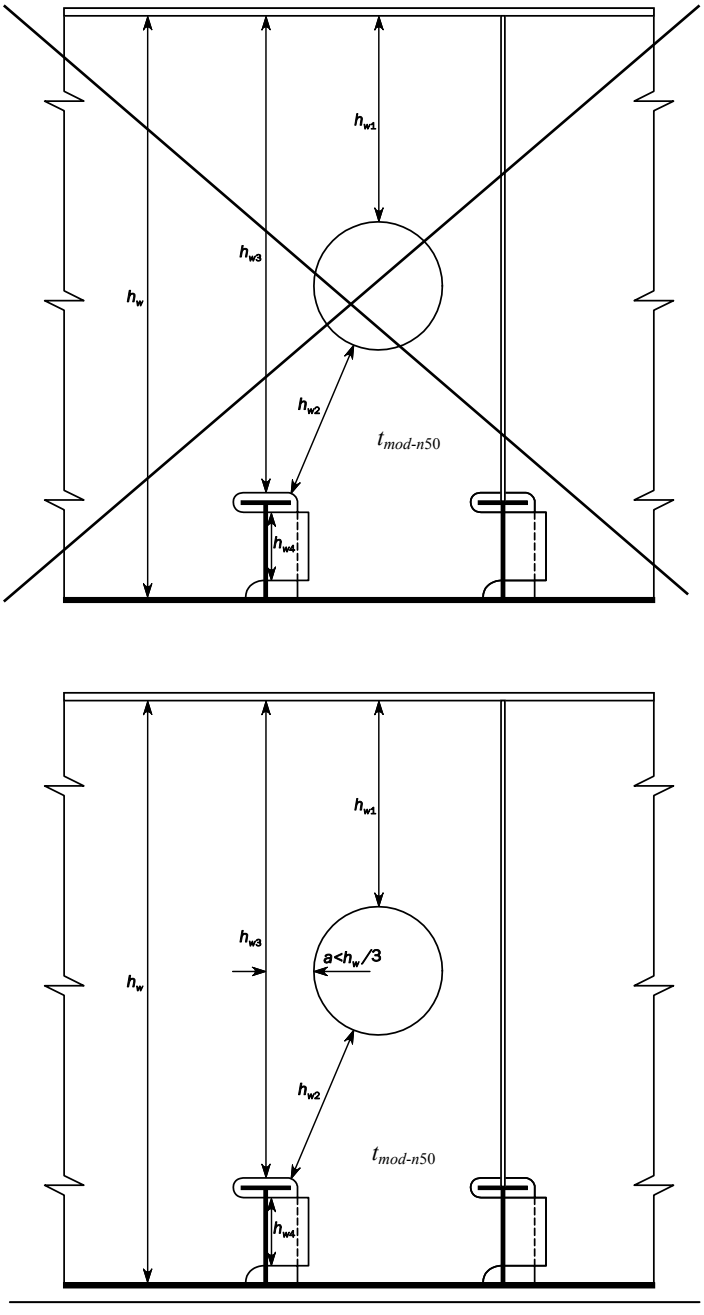
σ_{elem_s} : Stress in the spanwise direction of the girder (N/mm^2) before correction.

σ_{elem_d} : Stress in the depth direction of the girder (N/mm^2) before correction.

(2) (Omitted)

Fig. C32.9.8-1 has been amended as follows.

Fig. C32.9.8-1 Effective Shear Area in Way of Web Openings



EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

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

* "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 2-2

C20 HATCHWAYS, MACHINERY SPACE OPENINGS AND OTHER DECK OPENINGS

C20.1 General

Paragraph C20.1.2 has been amended as follows.

C20.1.2 Position of Exposed Deck Openings

~~**1** "Exposed superstructure decks" stated in **20.1.2, Part C** of the Rules generally refers to exposed decks on the superstructure up to the second tier above the freeboard deck. However, if this deck height is less than the standard height for superstructures (h_S) specified in **V2.2.1**, then the exposed superstructure deck directly above the point $2h_S$ above the freeboard deck is to be taken.~~

~~**2** The exposed surfaces of the superstructure above the deck defined in **1** above may be regarded as a deckhouse or its exposed deck.~~

1 In the application of the requirements of **20.1.2, Part C** of the Rules, "superstructure decks" include top decks of superstructures, deckhouses, companionways and other similar deck structures.

2 "Exposed raised quarter decks" in the definition of Position I specified in **20.1.2, Part C** of the Rules refers to exposed superstructure decks lower than h_S specified in **V2.2.1** above the freeboard deck.

3 "Exposed superstructure decks" in the definition of Position I specified in **20.1.2, Part C** of the Rules refers to exposed superstructure decks lower than $2h_S$ specified in **V2.2.1** above the freeboard deck.

4 "Exposed superstructure decks located at least one standard height of superstructure above the freeboard deck" in the definition of Position II specified in **20.1.2, Part C** of the Rules refers to exposed superstructure decks located at least h_S specified in **V2.2.1** above the freeboard deck and lower than $2h_S$ specified in **V2.2.1** above the freeboard deck.

5 "Exposed superstructure decks located at least two standard heights of superstructure above the freeboard deck" in the definition of Position II specified in **20.1.2, Part C** of the Rules refers to exposed superstructure decks located at least $2h_S$ specified in **V2.2.1** above the freeboard deck and lower than $3h_S$ specified in **V2.2.1** above the freeboard deck.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 27 December 2016.

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.

Amendment 2-3

C25 CEMENTING AND PAINTING

C25.2 Painting

C25.2.2 Protective Coatings in Dedicated Seawater Ballast Tanks and Double-side Skin Spaces

Sub-paragraph -2 has been amended as follows.

2 With respect to the provision of **25.2.2-1, Part C of the Rules,** the following tanks are not considered to be dedicated seawater ballast tanks~~:~~, provided the coatings applied in the tanks described in **(2)** below are confirmed by the coating manufacturer to be resistant to the media stored in the tanks, and are applied and maintained according to the coating manufacturer's procedures.

(1) ~~t~~Tanks identified as "Spaces included in Net Tonnage" in the International Convention on Tonnage Measurement of Ships, 1969~~; and~~

(2) ~~s~~Sea water ballast tanks in livestock carriers also designated for the carriage of the livestock dung~~.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 27 December 2016.

Amendment 2-4

C35 MEANS OF ACCESS

C35.2 Special Requirements for Oil Tankers and Bulk Carriers

C35.2.4 Means of Access within Spaces

Sub-paragraph -7 has been amended as follows.

7 Unless stated otherwise in **35.2.4**, **Part C** of the Rules, vertical ladders that are fitted on vertical structures for inspection are to comprise of one or more ladder linking platforms spaced not more than 6 *m* apart vertically and displaced to one side of the ladder. Adjacent sections of ladder are to be laterally offset from each other by at least the width of the ladder. For the purpose of complying with the above, adjacent sections of ladders are to be in accordance with **C35.2.3-6**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

1. The effective date of the amendments is 27 December 2016.

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.

* "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 2-5

C1 GENERAL

C1.1 General

C1.1.12 Special Requirements for Application of Steels

Sub-paragraph -1 has been amended as follows.

1 Application of steels for ships intended to operate in areas with low air temperature

(1) Design temperature (T_D) specified in **1.1.12-1**, **Part C of the Rules** is to be taken as the lowest daily average air temperature over one *year* (*See* **Fig. C1.1.12-1(1)**), and is to be classified in accordance with **Table C1.1.12-1(1)**. For seasonally restricted service, the lowest temperature within the relevant period of operation may be taken.

(2) Notwithstanding the requirements in **(1)** above, for the ships specified in **1.1.1-2**, **Part I of the Rules**, the design temperature (T_D) specified in **1.1.12-1**, **Part C of the Rules** is not to be greater than either the lowest daily average air temperature over a period of one *year* (*See* **Fig. C1.1.12-1(1)**) or 13°C higher than the polar service temperature (*See* **1.2.1 (21), Part I of the Rules**) of the ship, whichever is lower; moreover, said design temperature is to be classified in accordance with **Table C1.1.12-1(1)**. For seasonally restricted service, design temperature may be taken as either the lowest temperature within the relevant period of operation or 13°C higher than the polar service temperature, whichever is lower. The above-mentioned lowest daily average air temperature over a period one year is to be determined based upon measurement data taken over at least 10 years.

(~~2~~3) Application of steels ~~for~~ exposed to the atmosphere used on ships intended to operate in areas ~~with~~ of the low temperatures specified in **1.1.12-1**, **Part C of the Rules** is subject to **Table C1.1.12-1(2)** corresponding to the structural member category. Details of material class are subject to **Fig. C1.1.12-1(2)** and **Fig. C1.1.12-1(3)** corresponding to the design temperature category. However, application of steels for structural members not specified in **Table C1.1.12-1(2)** may be subject to **Table C1.1** and **Table C1.2**, **Part C of the Rules** regardless of the design temperature.

Table C1.1.12-1(2) has been amended as follows.

Table C1.1.12-1(2) Application of Steels ~~for~~ Exposed to the Atmosphere used on Ships Intended to Operate in Areas of ~~with~~ Low Temperatures

Structural member	Material Class	
	Within 0.4*L* amidships	Outside 0.4*L* Amidship
・ Deck plating exposed to weather, in general ・ Side plating above *BWL*~~*1~~(1) ・ Transverse bulkheads above *BWL*~~*1~~(1) (2)	I	I
・ Strength deck plating ・ Strength deck plating at corners of hatch except for the large hatch openings ・ Longitudinal members above strength deck including bracket and face plate except for web and face plate of continuous longitudinal hatch coamings ・ Longitudinal bulkheads above *BWL*~~*1~~(1) (2) ・ Top side tank bulkheads above *BWL*~~*1~~(1) (2)	II	I
・ Sheer strake at strength deck ・ Stringer plate in strength deck ・ Strength deck plating at corners of hatch with large hatch openings ・ Deck strake at longitudinal bulkhead ・ Face plate and web of continuous longitudinal hatch coamings	III	II

Notes:

~~*1~~(1) *BWL*: Ballast water line is the water line at the lowest draught condition during navigation and includes single strakes that cross it.

(2) Applicable to plating attached to hull envelope plating exposed to low air temperatures. At least one strake is to be considered in the same way as exposed plating with the strake width at least 600 *mm*.

EFFECTIVE DATE AND APPLICATION (Amendment 2-5)

1. The effective date of the amendments is 1 January 2017.

Amendment 2-6

C4 SUBDIVISIONS

C4.2 Subdivision Index

C4.2.3 Probability of Survival (s_i)

Sub-paragraphs -2 to -5 have been renumbered to Sub-paragraphs -3 to -6 and Sub-paragraph -2 has been added as follows.

1 (Omitted)

2 In applying θ_v specified in **4.2.3-1, Part C of the Rules**, an "opening incapable of being closed weathertight" includes ventilators provided with weathertight closing appliances in accordance with the requirements of **23.6.5-2, Part C of the Rules** that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

~~**2**~~**3** (Omitted)

~~**3**~~**4** (Omitted)

~~**4**~~**5** (Omitted)

~~**5**~~**6** (Omitted)

C23 BULWARKS, GUARDRAILS, FREEING ARRANGEMENTS, CARGO PORTS AND OTHER SIMILAR OPENINGS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND GANGWAYS

C23.6 Ventilator

Paragraph C23.6.7 has been amended as follows.

C23.6.7 Ventilators for Emergency Generator Room

1 Where it is not practicable for the height of ventilator coamings to comply with **23.6.7, Part C** of the Rules, they are to comply with the following requirements **(1)** or **(2)** instead.

(1) Where the emergency generator room is located in an enclosed superstructure, the ventilators are to have coamings in compliance with **23.6.1, Part C** of the Rules, and are to be fitted with weathertight closing appliances in combination with other suitable arrangements to ensure adequate ventilation.

(2) In cases other than **(1)** above, where the emergency generator room has no opening leading to a space below the freeboard deck, the height of coamings of ventilators to supply air to the emergency generator room, above the upper surface of the deck, is to be at least 900*mm* above the surface of the deck in Position I or 760*mm* above the surface of the deck in Position II specified in **20.1.2, Part C** of the Rules. In addition, these ventilator openings are to be fitted with suitable protection devices such as louvers to prevent the intrusion of sea-water. Openings on the boundaries of the emergency generator room are to be treated in a similar manner.

2 The weathertight closing appliances and louvers specified in **-1** above are also to comply with requirements specified in **1.3.5-2, Part D of the Rules**.

C31A ADDITIONAL REQUIREMENTS FOR NEW BULK CARRIERS

C31A.2 Damage Stability

C31A.2.1 Survivability

Sub-paragraph -2 has been added as follows.

1 (Omitted)
2 In applying the requirements of **31A.2.1-2(4), Part C of the Rules**, "unprotected openings" include ventilators provided with weathertight closing appliances in accordance with the requirements of **23.6.5-2, Part C of the Rules** that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

Chapter 32 CONTAINER CARRIERS

C32.13 Special Requirements for Container Carriers Applying Extremely Thick Steel Plates

C32.13.4 Brittle Crack Arrest Design

Sub-paragraphs -1 to -3 have been renumbered to Sub-paragraphs -2 to -4 and Sub-paragraph -1 has been added as follows.

1 "Other weld areas" in **32.13.4-3(3), Part C of the Rules** includes the following (refer to **Fig.C32.13.4-1**):

(1) Fillet welds where hatch side coaming plating, including top plating, meets longitudinals;

(2) Fillet welds where hatch side coaming plating, including top plating and longitudinals, meets attachments. (e.g., Fillet welds where hatch side top plating meets hatch cover pad plating.);

(3) Fillet welds where hatch side coaming top plating meets hatch side coaming plating;

(4) Fillet welds where hatch side coaming plating meets upper deck plating;

(5) Fillet welds where upper deck plating meets inner hull/bulkheads;

(6) Fillet welds where upper deck plating meets longitudinals; and

(7) Fillet welds where sheer strakes meet upper deck plating.

~~1~~**2** "Appropriate measure" in **32.13.4-4(3), Part C of the Rules** means that the block-to-block butt welds of the hatch side coaming are to be shifted from those of the strength deck, this shift is to be greater than or equal to 300*mm* in principle and welded joints between hatch side coaming and strength deck are to be fillet weld at each side without groove for an appropriate region.

~~2~~**3** If detailed documentation (including information such as construction procedure, application and procedure of non-destructive inspections at joints, etc.) which demonstrates the applicability as an alternative measure to ~~-1~~**2** above is submitted to and approved by the Society, the following **(1)** and **(2)** may be applied instead. In such cases, where deemed necessary by the Society, brittle fracture tests may be required to confirm the effectiveness of the alternative measure.

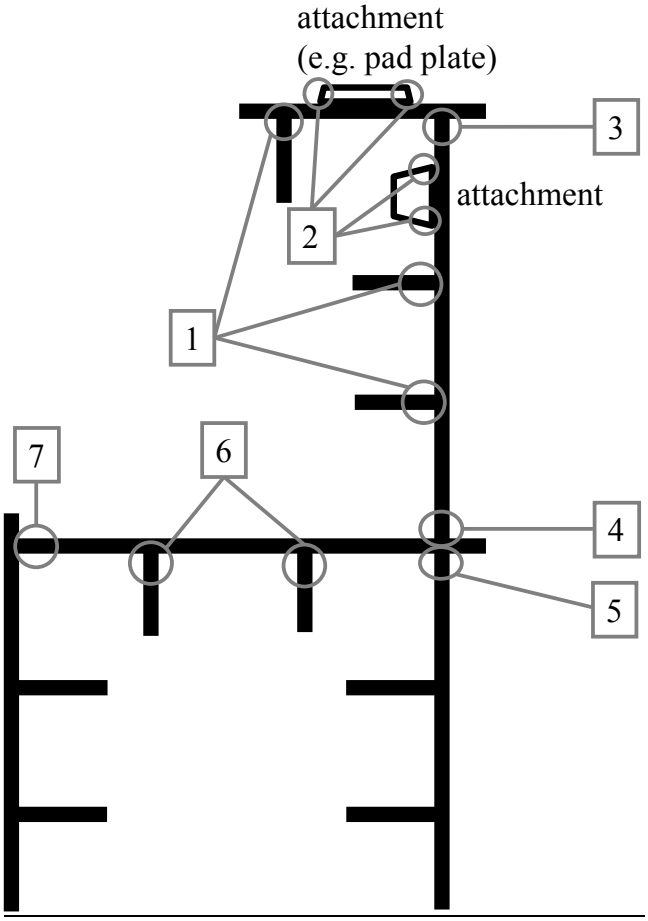
(1) Where crack arrest holes are provided in way of the block-to-block butt welds at the region where hatch side coaming weld meets the deck weld, the fatigue strength of the lower end of the butt weld is to be assessed.

(2) Where arrest insert plates of brittle crack arrest steel or weld metal inserts with high crack arrest toughness properties are provided in way of the block-to-block butt welds at the region where hatch side coaming weld meets the deck weld.

~~3~~**4** In **32.13.4-6, Part C of the Rules**, where steel plate being evaluated using the manner of assessment other than specified in **3.12, Part K of the Rules** is for use as crack arresting steel, documents related to the manner of assessment and the applicability which the measure has equivalent with brittle crack arrest properties for *A*600 are submitted to the Society for approval. In this case, where deemed necessary by the Society, additional test may be required.

Fig. C32.13.4-1 has been added as follows.

Fig.C32.13.4-1　Other Weld Areas



Annex C1.1.7-5 GUIDANCE FOR THE USE OF FIBER REINFORCED PLASTIC (FRP)

1.3 Requirements for FRP Depending On Service and/or Locations

1.3.1 Requirements for FRP Depending On Service and/or Locations

Table 1.3.1 has been amended as follows.

Table 1.3.1 Applicable Requirements of FRP

Location	Service	Fire Integrity	Fire Retardance	Flame Spread and Surface Flammability	Smoke Generation	Toxicity
Cargo Pump Rooms	All personnel walkways, catwalk, ladder, platforms or access areas	L1	○	○	-	-
Cargo Holds	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1	○	-	-	-
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-	○	-	-	-
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	-[3)]	○	-	-	-
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	-[3)]	○	-	-	-
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	-[4)]	○	-	-	-
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	-[4)]	○	-	-	-
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	L1	○	○	○	-
Lifeboat embarkation or temporary safe refuse stations in open deck areas	All personnel walkways, catwalks, ladders, platforms or access areas	L2	○	-	-	-
Open Decks or semi-enclosed areas	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue ~~6)~~	L3[5)]	○	-~~7)~~	-~~7)~~	-~~7)~~
	Safe access to bow specified in **23.7.2**, **Part C of the Rules**.	-[5) and 6)]	○	-[7)]	-[7)]	-[7)]
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-	○	-	-	-

Notes:

1) SYMBOL

○: Fire retardance test specified in **9.4.2-2**, flame spread and surface flammability test specified in **9.4.2-3**, smoke generation test specified in **9.4.2-4**, and the toxicity test specified in **9.4.2-5**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be satisfied.

- : Not applicable

2) ABBREVIATIONS

L1: L1 is the abbreviations of fire retardance Level 1. FRP complying with L1 means it complies with the standard of fire retardance test specified in **9.4.2-1(3)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

L2: L2 is the abbreviations of fire retardance Level 2. FRP complying with L2 means it complies with the standard of fire retardance test specified in **9.4.2-1(2)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

L3: L3 is the abbreviations of fire retardance Level 3. FRP complying with L3 means it complies with the standard of fire retardance test specified in **9.4.2-1(1)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

3) If these spaces are normally entered when underway, FRP of L1 integrity is to be required.

4) If these spaces are normally entered when underway, FRP of L3 integrity is to be required.

5) Vessels fitted with fixed foam fire-extinguishing systems and fixed dry chemical powder type extinguishing systems on deck require FRP of L1 integrity for foam system operational areas and access routes.

~~6) Including the gangways to bow specified in **23.7.2**, **Part C of the Rules**.~~

6) The standard of the fire integrity test specified in **9.4.2-1(4)**, **Chapter 9**, **Part 2** of **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** is to be satisfied.

7) ~~The gangways to bows specified in **23.7.2**, **Part C of the Rules** are to comply with t~~The standards of the surface flammability test specified in **9.4.2-3(2)**, the smoke generation test specified in **9.4.2-4(2)**, and the toxicity test specified in **9.4.2-5(1)** ~~**in 9.4.2-5**~~, **Chapter 9**, **Part 2** of ~~**the**~~ **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be satisfied.

EFFECTIVE DATE AND APPLICATION (Amendment 2-6)

1. The effective date of the amendments is 1 January 2017.

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.

* "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 2-7

C6 DOUBLE BOTTOMS

C6.1 General

C6.1.1 Application

Table C6.1.1-1 has been amended as follows.

Table C6.1.1-1 Assumed Extent of Damage

	For 0.3*L* from the forward perpendicular of the ship	Any other part of the ship
Longitudinal extent	$1/3\,L_f^{2/3}$ or 14.5*m*, whichever is less	$1/3\,L_f^{2/3}$ or 14.5*m*, whichever is less
Transverse extent	*B*'/6 or 10*m*, whichever is less	*B*'/6 or 5*m*, whichever is less
Vertical extent, measured from the keel line	*B*'/20 or 2*m*, whichever is less	*B*'/20 or 2*m*, whichever is less

Notes:
1. Keel line is to be in accordance with ~~**4.2.3**~~ **2.1.48, Part A** of the Rules.
2. Ship breadth (*B*') is to be in accordance with **4.1.2(11), Part C** of the Rules.

EFFECTIVE DATE AND APPLICATION (Amendment 2-7)

1. The effective date of the amendments is 1 January 2017.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships other than ships that fall under the following:
(1) for which the building contract is placed on or after the effective date; or
(2) in the absence of a building contract, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2017; or

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

(3) the delivery of which is on or after 1 January 2021.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Guidance apply to the ships that fall under the following:
(1) which convert to using low-flashpoint fuels on or after the effective date; or
(2) which, on or after the effective date, undertake to use low-flashpoint fuels different from those which it was originally approved to use before the effective date.

Amendment 2-8

C31B ADDITIONAL REQUIREMENTS FOR EXISTING BULK CARRIERS

C31B.1 General

C31B.1.1 Application

Sub-paragraph -2 has been amended as follows.

1 "Bulk Carriers defined in **1.3.1(13), Part B** of the Rules with single side skin construction" stipulated in **31B.1.1-1, Part C** of the Rules mean the bulk carriers defined in **1.3.1(13), Part B** of the Rules that have single side skin construction in the foremost cargo hold. In this case, double side skin construction with less than 760*mm* between the side shell (between the bottom of top-side tank and the top of bilge hopper tank in cargo holds) and longitudinal watertight bulkhead is to be considered as single side skin construction. The distance between the side shell and longitudinal watertight bulkhead is to be measured perpendicular to the side shell.
2 Where Bulk Carriers are reinforced to comply with ice class notation in accordance with the requirements in **Chapter ~~5~~8, Part I** of the Rules, the intermediate frames are not included in "cargo hold frames" as referred to in **31B.1.1-2, Part C** of the Rules.

C31B.5 Hold Frames

C31B.5.2 Steel Renewal Criteria and Reinforcing Measures

Sub-paragraph -1 has been amended as follows.

1 A bulk carrier with ice strengthening structure in accordance with the requirements in **Chapter ~~5~~8, Part I** of the Rules that withdraws its ice classification is to remain in compliance with the requirements in **31B.5, Part C** of the Rules, with the exception of existing tripping brackets which comply with the requirements of **31B.5.2-5, Part C** of the Rules.
(-2 to -7 are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-8)

1. The effective date of the amendments is 1 January 2017.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships the keels of which were laid or which were at *a similar stage of construction* before the effective date except for in cases where the amendments are to be retroactively applied.

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.