06-391

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part CSR-B Common Structural Rules for Bulk Carriers

Rules for the Survey and Construction of Steel Ships
Part CSR-B 2007 AMENDMENT NO.1

Rule No.12 1st February 2007
Resolved by Technical Committee on 17th November 2006
Approved by Board of Directors on 19th December 2006

ClassNK
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Rule No.12 1st February 2007
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 CSR-B Common Structural Rules for Bulk Carriers

Amendment 1-1

Chapter 3 STRUCTURAL DESIGN PRINCIPLES

Section 2 NET SCANTLING APPROACH

3.2 Considering net scantling

Paragraph 3.2.7 has been newly added as follows.

3.2.7 Check of primary supporting members for ships less than 150*m* in length *L*

The net thickness of plating which constitutes primary supporting members for ships less than 150*m* in length *L*, to be checked according to Ch 6, Sec 4, 2, is to be obtained by deducting t_C from the gross thickness.

Section 3 CORROSION ADDITIONS

1.2 Corrosion addition determination

1.2.1 Corrosion additions for steel

Table 1 has been amended as follows.

Table 1 Corrosion addition on one side of structural members

Compartment Type	Structural member		Corrosion addition, t_{C1} or t_{C2}, in *mm*	
			BC-A or *BC-B* ships with $L \geq 150$ *m*	Other
Ballast water tank(2)	Face plate of primary members	Within 3 *m* below the top of tank(3)	2.0	
		Elsewhere	1.5	
	Other members	Within 3 *m* below the top of tank(3)	1.7	
		Elsewhere	1.2	
Dry bulk cargo hold(1)	Transverse bulkhead	Upper part(4)	2.4	1.0
		Lower stool sloping plate, vertical plate and top plate	5.2	2.6
		Other parts	3.0	1.5
	Other members	Upper part(4)	1.8	1.0
		Webs and flanges of the upper end brackets of side frames of single side bulk carriers		
		Webs and flanges of lower brackets of side frames of single side bulk carriers	2.2	1.2
		Other parts	2.0	1.2
	Sloped plating of hopper tank, inner bottom plating	Continuous wooden ceiling	2.0	1.2
		No continuous wooden ceiling	3.7	2.4
Exposed to atmosphere	Horizontal member and weather deck(5)		1.7	
	Non horizontal member		1.0	
Exposed to sea water(7)			1.0	
Fuel oil tanks and lubricating oil tanks(2)			0.7	
Fresh water tanks			0.7	
Void spaces(6)	Spaces not normally accessed, e.g. access only through bolted manholes openings, pipe tunnels, etc.		0.7	
Dry spaces	Internal of deck houses, machinery spaces, stores spaces, pump rooms, steering spaces, etc.		0.5	
Other compartments than above			0.5	

Notes
(1) Dry bulk cargo hold includes holds, intended for the carriage of dry bulk cargoes, which may carry water ballast.
(2) The corrosion addition of a plating between water ballast and heated fuel oil tanks is to be increased by 0.7 *mm*.
(3) This is not to be applied to structural members of inner bottom and located below inner bottom.
(4) Upper part of the cargo holds corresponds to an area above the connection between the top side and the inner hull or side shell. If there is no top side, the upper part corresponds to the upper one third of the cargo hold height.
(5) Horizontal member means a member making an angle up to 20° as regard as a horizontal line.
(6) The corrosion addition on the outer shell plating in way of pipe tunnel is to be considered as water ballast tank.
(7) Outer side shell between normal ballast draught and scantling draught is to be increased by 0.5 *mm*.

Chapter 8 FATIGUE CHECK OF STRUCTURAL DETAILS

Section 2 FATIGUE STRENGTH ASSESSMENT

2.3 Equivalent notch stress range

Paragraph 2.3.2 has been amended as follow.

2.3.2 Equivalent hot spot stress range

The equivalent hot spot stress range, in N/mm^2, is to be calculated for each loading condition with the following formula:

$$\Delta\sigma_{equiv,\,j} = f_{mean,\,j}\,\Delta\sigma_{W,\,j}$$

where:

$f_{mean\,,j}$: Correction factor for mean stress :

- for hatch corners $f_{mean\,,j} = 0.77$
- for primary members and longitudinal stiffeners connections, $f_{mean\ ,\ j}$ corresponding to the condition "j" taken equal to:

$$f_{mean,\,j} = \max\left\{0.4, \left[\max\left(0, \frac{1}{2} + \frac{-\ln\left(10^{-4}\right)}{4}\frac{\sigma_{m,\,j}}{\Delta\sigma_{W,\,j}}\right)\right]^{0.25}\right\}$$

$\sigma_{m,\,1}$: Local hot spot mean stress, in N/mm^2, in the condition "1", obtained from the following formulae:

- if $0.6\Delta\sigma_{W,1} \geq 2.5R_{eH}$:

  $\sigma_{m,1} = -0.18\Delta\sigma_{W,1}$

- if $0.6\Delta\sigma_{W,1} < 2.5R_{eH}$:

  $\sigma_{m,1} = R_{eH} - 0.6\Delta\sigma_{W,1}$ for $0.6\Delta\sigma_{W,1} > R_{eH} - \sigma_{res} - \sigma_{mean,1}$

  $\sigma_{m,1} = \sigma_{mean,1} + \sigma_{res}$ for $0.6\Delta\sigma_{W,1} \leq R_{eH} - \sigma_{res} - \sigma_{mean,1}$

$\sigma_{m\,,j}$: Local hot spot mean stress, in N/mm^2, in the condition "j", obtained from the following formulae:

- if $0.24\Delta\sigma_{W,\,j} \geq R_{eH}$:

  $\sigma_{m,\,j(j\neq1)} = -0.18\Delta\sigma_{W,\,j}$

- if $0.24\Delta\sigma_{W,\,j} < R_{eH}$:

  $\sigma_{m,\,j(j\neq1)} = -R_{eH} + 0.24\Delta\sigma_{W,\,j}$

  for $0.24\Delta\sigma_{W,\,j} > R_{eH} + \sigma_{m,1} - \sigma_{mean,1} + \sigma_{mean,\,j}$

  $\sigma_{m,\,j(j\neq1)} = \sigma_{m,1} - \sigma_{mean,1} + \sigma_{mean,\,j}$

  for $0.24\Delta\sigma_{W,\,j} \leq R_{eH} + \sigma_{m,1} - \sigma_{mean,1} + \sigma_{mean,\,j}$

$\sigma_{mean\,,j}$: Structural hot spot mean stress, in N/mm^2, corresponding to the condition "j"

σ_{res} : Residual stress, in N/mm^2, obtained from the following formulae:

$$\sigma_{res} = \max\left\{\sigma_{res,\,j}\ ,\quad j = 1,2,3,4\right\}$$

$$\sigma_{res,j} = \begin{cases} \max\left[-R_{eH}, \min\left\{R_{eH}, \sigma_{res0} + \sigma_{mean,j} + 0.6\Delta\sigma_{W,j}\right\} - \sigma_{mean,j} - 0.6\Delta\sigma_{W,j}\right] & \text{for } \sigma_{mean,j} \geq 0 \\ \min\left[R_{eH}, \max\left\{-R_{eH}, \sigma_{res0} + \sigma_{mean,j} - 0.24\Delta\sigma_{W,j}\right\} - \sigma_{mean,j} + 0.24\Delta\sigma_{W,j}\right] & \text{for } \sigma_{mean,j} < 0 \end{cases}$$

$$\sigma_{res0} = \begin{cases} 0.25R_{eH} & \text{for welded joint} \\ 0 & \text{for non welded part} \end{cases}$$

EFFECTIVE DATE AND APPLICATION(Amendment 1-1)

1. The effective date of the amendments is 1st April 2006.

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.
*"contract for construction" is defined in IACS Procedural Requirement(PR) No.29 (Rev.3).

IACS PR No.29 (Rev.3)

Unless specified otherwise:

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 sister 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, a "series of sister vessels" is a series of vessels built to the same approved plans for classification purposes, under a single contract for construction. The optional vessels will be considered part of the same series of sister 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.

Notes:

1. This Procedural Requirement applies to all IACS Members and Associates.
2. This Procedural Requirement is effective for ships "contracted for construction" on or after 1 January 2005.
3. Sister vessels may have minor design alterations provided such alterations do not affect matters related to classification.
4. Revision 2 of this Procedural Requirement is effective for ships "contracted for construction" on or after 1 April 2006.
5. Revision 3 of this Procedural Requirement was approved on 5 January 2007 with immediate effect.

Amendment 1-2

Chapter 13 SHIPS IN OPERATION, RENEWAL CRITERIA

Section 1 MAINTENANCE OF CLASS

1. General

1.2 Definitions

Paragraph 1.2.2 has been deleted.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2007.
2. Notwithstanding the amendments to the Rules, the current requirements may apply to the surveys for which the application is submitted to the Society before the effective date.