06-390

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part C Hull Construction and Equipment

Rules for the Survey and Construction of Steel Ships
Part C 2006 AMENDMENT NO.2

Rule No.29 20th March 2006
Resolved by Technical Committee on 3rd February 2006
Approved by Board of Directors on 28th February 2006

ClassNK
NIPPON KAIJI KYOKAI

Rule No.29 20th March 2006
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

Chapter 31B ADDITIONAL REQUIREMENTS FOR EXISTING BULK CARRIER

31B.5 Hold Frames

31B.5.2 Steel Renewal Criteria and Reinforcing Measures

Sub-paragraph -1(1) has been revised as follows.

(1) $t_{REN} = t_{COAT} - t_C$

t_{COAT} : $0.75t_{S12}$ (mm)

t_C : The value specified in **Table C31B.5.2** (*mm*)

t_{S12} : Web of hold frame and web of bracket thickness required according to **31.1.6-2** and **31.6.2-5** (*mm*)

Sub-paragraph -1(3) has been revised as follows.

(3) $t_{REN} = t_{REN,d/t}$

$t_{REN,d/t}$: Web thickness, in *mm*, which satisfies the following web depth to thickness ratio for frames and brackets (applicable to Zone *A* and *B* only). However, the following **(a)** may be disregarded, provided that tripping brackets are fitted in accordance with **-5**.

(a) Web depth to thickness ratio for frames

$65\sqrt{K}$ for symmetrically flanged frames

$55\sqrt{K}$ for asymmetrically flanged frames

(b) Web depth to thickness ratio for the lower brackets at section *a*) (see **Fig. C31B.5.2**)

$87\sqrt{K}$ for symmetrically flanged frames

$73\sqrt{K}$ for asymmetrically flanged frames

Where the value of *K* is as follows:

1.00 : Where mild steels *KA, KB, KD* or *KE* are used.

0.78 : Where high tensile steels *KA*32*, KD*32*, KE*32 or *KF*32 are used.

0.72 : Where high tensile steels *KA*36*, KD*36*, KE*36 or *KF*36 are used.

When calculating the web depth to the thickness ration of the lower brackets, the web depth of the lower bracket may be measured from the intersection between the sloped bulkhead of the hopper tank and the side shell plate, perpendicularly to the face plate of the lower bracket (See **Fig.C31B.5.3**). In the case of stiffeners fitted on the lower bracket plate, the web depth may be

taken as the distance between the side shell and the stiffener, between the stiffeners or between the stiffeners and the face plate of the brackets, whichever is the largest.
For the side frames, including the lower bracket, located immediately abaft the collision bulkheads, whose scantlings are increased in order that their moment of inertia is such to avoid undesirable flexibility of the side shell, when their web as built thickness t_{AB} is greater than 1.65 *times* of $t_{REN,S}$ defined by **31B.5.3-4**, the thickness $t_{REN,d/t}$ may be taken as the value $t'_{REN,d/t}$ obtained from the following equation.

$$t'_{REN,d/t} = \sqrt[3]{t_{REN,d/t}{}^2 \cdot t_{REN,S}}$$

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

2 When lower brackets are not fitted face plate or flange, Lower brackets are to be flanged or face plate is to be fitted. The thickness of face plate or flange is not to be less than the thickness of the web of lower bracket.

Sub-paragraph -4 has been revised as follows.

4 When $t_{REN} < t_M \leq t_{COAT}$, measures are to be taken, consisting of all the following **(1)** through **(3)**. However, the measures may be waived if the structural members show no thickness diminution with respect to the as built thicknesses and coating is in "as-new" condition (*i.e.* without breakdown or rusting).
When the measured frame webs t_M is such that $t_{REN} < t_M \leq t_{COAT}$ and the coating is in Good condition, the coating as required in following (1) may be waived even if not found "as-new" condition, provided that tripping brackets are fitted and damaged in way of the tripping bracket welding is repaired.
(1) Sand blasting, or equivalent, and coating (see **-5**).
(2) Fitting tripping brackets (see **-6**), when the above condition occurs for any of the side frame zones *A*, *B*, *C* and *D*, shown in **Fig.C31B.5.1**.
(3) Maintaining the coating in "as-new" condition (*i.e.* without breakdown or rusting) at Special and Intermediate Surveys.

Sub-paragraph -5(10) has been added as follows.

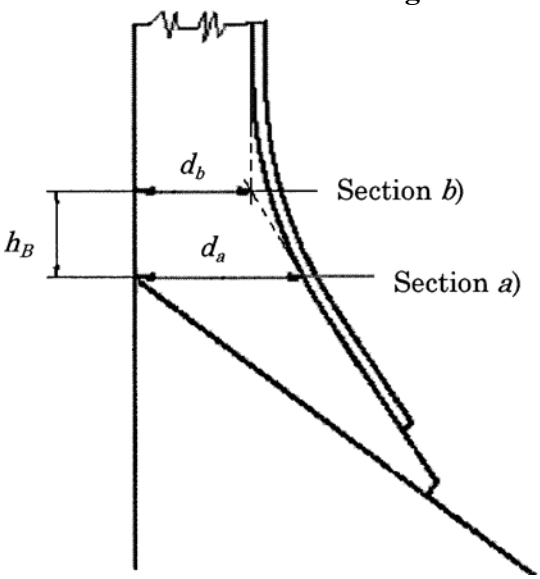
(10) When hold frames with asymmetrical section or flanged hold frames are renewed, the outstanding breath to thickness ratio of face or flange is to comply with **31.6.1-7**.

Sub-paragraph -7 has been added as follows.

7 When all frames in one or more holds are required to be renewed, the compliance with requirements in **31.6** may be accepted in lieu of the compliance with the requirements in this Chapter.

Fig.C31B.5.2 has been revised as follows.

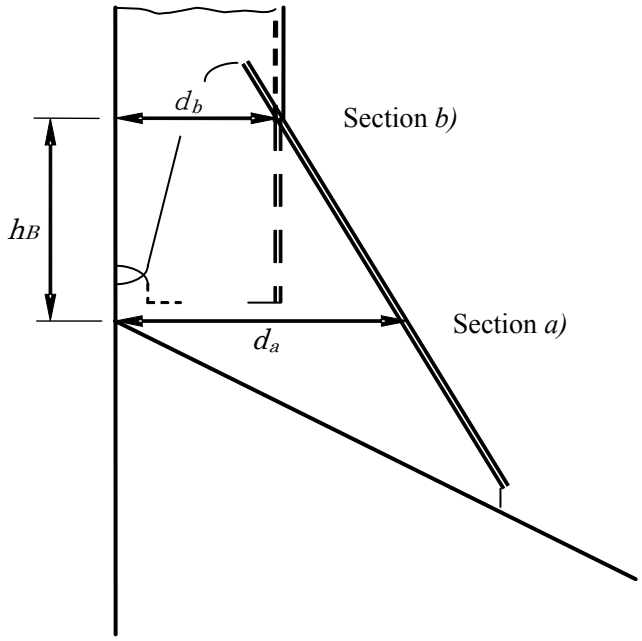
Fig.C31B.5.2 Sections *a*) and *b*)



d_a = lower bracket web depth for determining $t_{REN,S}$

d_b = frame web depth

h_B = lower bracket length



TableC31B.5.3 has been revised as follows.

Table C31B.5.3 Bending Moment Coefficients m_a and m_b

	m_a	m_b		
		$h_B \le 0.08h$	$h_B = 0.1h$	$h_B \ge 0.125h$
Empty holds of ships approved to operate in non homogeneous loading conditions	10	17	19	22
Other cases	12	20	22	26
Note 1: Non homogeneous loading condition means a loading condition in which the ratio between the highest and the lowest filling ratio, evaluated for each hold, exceeds 1.20 corrected for different cargo densities.				
Note 2: For intermediate values of the bracket length h_B, the coefficient m_b is obtained by linear interpolation between the table values.				

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 July 2006.

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.