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 2013 AMENDMENT NO.1

Rule No.38 30th May 2013
Resolved by Technical Committee on 4th February 2013
Approved by Board of Directors on 4th March 2013

ClassNK
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Rule No.38 30th May 2013
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

Chapter 3 STRUCTURAL DESIGN PRINCIPLES

Section 6 STRUCTURAL ARRANGEMENT PRINCIPLES

9. Deck structure

9.6 Openings in the strength deck

Paragraph 9.6.3 has been amended as follows.

9.6.3 Corner of hatchways

For hatchways located within the cargo area, insert plates, whose thickness is to be determined according to the formula given after, are generally to be fitted in way of corners where the plating cut-out has a circular profile.

The radius of circular corners is to be not less than 5% of the hatch width, where a continuous longitudinal deck girder is fitted below the hatch coaming.

Corner radius, in the case of the arrangement of two or more hatchways athwartship, is considered by the Society on a case by case basis.

For hatchways located within the cargo area, insert plates are, in general, not required in way of corners where the plating cut-out has an elliptical or parabolic profile and the half axes of elliptical openings, or the half lengths of the parabolic arch, are not less than:

- 1/20 of the hatchway width or 600 *mm*, whichever is the lesser, in the transverse direction
- twice the transverse dimension, in the fore and aft direction.

Where insert plates are required, their net thickness is to be obtained, in *mm*, from the following formula:

~~$t_{INS} = (0.8 + 0.4\ell / b)t$~~

$t_{INS} = (0.8 + 0.4b / \ell)t$

without being taken less than t or greater than $1.6t$

where:

ℓ : Width, in *m*, in way of the corner considered, of the cross deck strip between two consecutive hatchways, measured in the longitudinal direction (see **Fig. 23**)

b : Width, in *m*, of the hatchway considered, measured in the transverse direction (see **Fig. 23**)

t : Actual net thickness, in *mm*, of the deck at the side of the hatchways.

For the extreme corners of end hatchways, the thickness of insert plates is to be 60% greater than

the actual thickness of the adjacent deck plating. A lower thickness may be accepted by the Society on the basis of calculations showing that stresses at hatch corners are lower than permissible values.

Where insert plates are required, the arrangement is shown in **Fig. 25**, in which d_1, d_2, d_3 and d_4 are to be greater than the ordinary stiffener spacing.

For hatchways located outside the cargo area, a reduction in the thickness of the insert plates in way of corners may be considered by the Society on a case by case basis.

For ships having length $L_{CSR\text{-}B}$ of 150 *m* or above, the corner radius, the thickness and the extent of insert plate may be determined by the results of a direct strength assessment according to **Ch 7, Sec 2** and **Sec 3**, including buckling check and fatigue strength assessment of hatch corners according to **Ch 8, Sec 5**.

Chapter 6 HULL SCANTLINGS

Section 3 BUCKLING & ULTIMATE STRENGTH OF ORDINARY STIFFENERS AND STIFFENED PANELS

Symbols

Table 1 has been amended as follows.

Table 1 Correction factor F_1

	F_1[(2)]	Edge stiffener
Stiffeners sniped at both ends	1.00	
Guidance values where both ends are effectively connected to adjacent structures[(1)]	1.05	Flat bar
	1.10	Bulb section
	~~1.20~~ 1.21	Angle and tee-sections
	1.30	Girders of high rigidity (e.g. bottom transverses)
(1) Exact values may be determined by direct calculations. (2) An average value of F_1 is to be used for plate panels having different edge stiffeners.		

Chapter 11 CONSTRUCTION AND TESTING

Section 3 TESTING OF COMPARTMENTS

2. Testing methods

2.3 Hose testing

Paragraph 2.3.1 has been amended as follows.

2.3.1

When hose testing is required to verify the tightness of the structures, as defined in **Table 1**, the minimum pressure in the hose, at least equal to ~~$0.20 \cdot 10^5$~~ $2.0 \cdot 10^5$ *Pa*, is to be applied at a maximum distance of 1.5 *m*. The nozzle diameter is not to be less than 12 *mm*.

Chapter 13 SHIPS IN OPERATION, RENEWAL CRITERIA

Section 1 MAINTENANCE OF CLASS

1. General

1.1 Application

Paragraph 1.1.1 has been amended as follows.

1.1.1

The survey requirements for the maintenance of class of bulk carriers covered by this Part are given in ~~*UR* Z10.2 for single side skin bulk carriers and *UR* Z10.5 for double side skin bulk carriers~~ **Part B**.

Thickness measurements are a major part of surveys to be carried out for the maintenance of class, and the analysis of these measurements is a prominent factor in the determination and extent of the repairs and renewals of the ship's structure.

Paragraph 1.1.2 and 1.1.3 have been deleted.

1.1.2 (Void)

~~This Chapter is intended to provide Owners, companies performing thickness measurements and Society's Surveyors with a uniform procedure in order to fulfill rule requirements for thickness measurements. In particular, it will enable all the above-mentioned parties to carry out:~~

~~• the planning and preparation~~

~~• the determination of extent and location~~

~~• the analysis~~

~~of the thickness measurements.~~

1.1.3 (Void)

~~This Chapter also takes into account specific requirements for thickness measurements relevant to close-up surveys within the scope of the Enhanced Survey Program (*ESP*) of single side skin bulk carriers and double side skin bulk carriers.~~

1.2 Definitions

Paragraph 1.2.3 has been added as follows.

1.2.3 Deck zone

The deck zone includes all the following items contributing to the hull girder strength above the horizontal strake of the topside tank or above the level corresponding to 0.9*D* above the base line if there is no topside tank:

- strength deck plating
- deck stringer
- sheer strake
- side shell plating
- top side tank sloped plating, including horizontal and vertical strakes
- longitudinal stiffeners connected to the above mentioned platings.

Paragraph 1.2.4 has been added as follows.

1.2.4 Bottom zone

The bottom zone includes the following items contributing to the hull girder strength up to the upper level of the hopper sloping plating or up to the inner bottom plating if there is no hopper tank:

- keel plate
- bottom plating
- bilge plate
- bottom girders
- inner bottom plating
- hopper tank sloping plating
- side shell plating
- longitudinal stiffeners connected to the above mentioned platings.

Paragraph 1.2.5 has been added as follows.

1.2.5 Neutral axis zone

The neutral axis zone includes the plating only of the items between the deck zone and the bottom zone, as for example:

- side shell plating
- inner hull plating, if any

Section 2 has been deleted.

~~Section 2 THICKNESS MEASUREMENTS AND ACCEPTANCE CRITERIA~~

~~Symbols~~

~~For symbols not defined in this Section, refer to **Ch 1, Sec 4.**~~

~~$t_{renewal}$: *Renewal thickness*; Minimum allowable thickness, in *mm*, below which renewal of structural members is to be carried out~~

~~$t_{renewal} = t_{as\_built} - t_C - t_{voluntary\_addition}$~~

~~$t_{reserve}$: Reserve thickness; Thickness, in *mm*, to account for anticipated thickness diminution that may occur during a survey interval of 2.5 *year*. ($t_{reserve}$ = 0.5 *mm*)~~

~~t_C : Corrosion addition, in *mm*, defined in **Ch 3, Sec3**~~

~~t_{as_built} : As built thickness, in *mm*, including $t_{voluntary\_addition}$, if any~~

~~$t_{voluntary\_addition}$: Voluntary thickness addition; Thickness, in mm, voluntarily added as the Owner's extra margin for corrosion wastage in addition to t_C~~

~~t_{gauged} : Gauged thickness, in *mm*, on one item, i.e average thickness on one item using the various measurements taken on this same item during periodical ship's in service surveys.~~

~~1. Application~~

~~1.1 General~~

~~1.1.1~~

~~This section provides the following information:~~

- ~~references to rule requirements and some additional information on the extent of the thickness measurements to be performed during surveys (see **2.1** and **2.2**)~~
- ~~locations of the measurements for the main parts of the ship (see **2.3**)~~
- ~~how to apply the acceptance criteria (see **3**).~~

~~Tables are also given to detail the above items. The sketches are given as an example to illustrate the requirements.~~

~~2. Rule requirements for the extent of measurements and the determination of locations~~

~~2.1 General~~

~~2.1.1~~

~~For the maintenance of class, thickness measurements are required during intermediate and class renewal surveys and may be required during annual surveys.~~

~~**Table 1** gives the references to the minimum requirements for thickness measurements related to the different types of surveys.~~

Table 1 References to rule requirements related to thickness measurements

Class renewal survey	Intermediate survey	Annual survey
Outside the cargo length area: *UR Z7*: • systematic measurements and suspect areas. • where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction.	Outside the cargo length area: *UR Z7*: • thickness measurements to be taken if deemed necessary by the Surveyor. • where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction.	Outside the cargo length area: *UR Z7*: • areas of substantial corrosion identified at previous class renewal or intermediate surveys; • where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction.
Within the cargo length area: a) single side skin bulk carriers: *UR Z10.2*: • planning and general requirements • measurements of elements subjected to close-up survey • extent of systematic thickness measurements • according to the different locations, where substantial corrosion is found b) double side skin bulk carriers: *UR Z10.5*: • planning and general requirements • measurements of elements subjected to close-up survey • extent of systematic thickness measurements • according to the different locations, where substantial corrosion is found	Within the cargo length area: a) single side skin bulk carriers: *UR Z10.2*: *Ships 10 years of age or less*: • for cargo holds • for salt ballast tanks • according to the different locations, where substantial corrosion is found *Ships over 10 years of age*: • see references given for class renewal survey • according to the different locations, where substantial corrosion is found b) double side skin bulk carriers: *UR Z10.5*: *Ships 10 years of age or less*: • for cargo holds • for salt ballast tanks • according to the different locations, where substantial corrosion is found *Ships over 10 years of age*: • see references given for class renewal survey • according to the different locations, where substantial corrosion is found	Within the cargo length area: a) single side skin bulk carriers: *UR Z10.2*: • for cargo holds and when deemed necessary by the Surveyor • for salt ballast tanks and when deemed necessary by the Surveyor • according to the different locations, where substantial corrosion is found b) double side skin bulk carriers: *UR Z10.5*: • for cargo holds and when deemed necessary by the Surveyor • for salt ballast tanks and when deemed necessary by the Surveyor • according to the different locations, where substantial corrosion is found

2.2 Class renewal survey

2.2.1

The thickness measurements required by the Rules consist of:

- systematic thickness measurements in order to assess the global and local strength of the ship
- thickness measurements as indicated in the program of close-up survey
- measurements of elements considered as suspect areas
- additional measurements on areas determined as affected by substantial corrosion.

2.2.2

For the determination of close-up surveys and relevant thickness measurements as well as the areas considered as suspect areas, reference is to be made to the related requirements of **Part B** and the relevant Sections of the following *IACS* Unified Requirements:

- for the hull structure and piping systems in way of cargo holds, cofferdams, pipe tunnels, void

spaces and fuel oil tanks within the cargo length area and all ballast tanks:

- *UR* Z10.2 "Hull surveys of single skin bulk carriers"
- *UR* Z10.5 "Hull surveys of double skin bulk carriers"

- for the remainder of the ship outside the cargo length area:
  - *UR Z7.*

2.3 Number and locations of measurements

2.3.1 Number of measurements

Considering the extent of thickness measurements as required by the Rules and indicated in **2.1** and **2.2**, the locations of the points to be measured are given for the most important items of the structure.

2.3.2 Locations of measurements

Table 2 provides explanations and/or interpretations for the application of those requirements indicated in the Rules which refer to both systematic thickness measurements related to the calculation of global hull girder strength and specific measurements connected to close-up surveys.

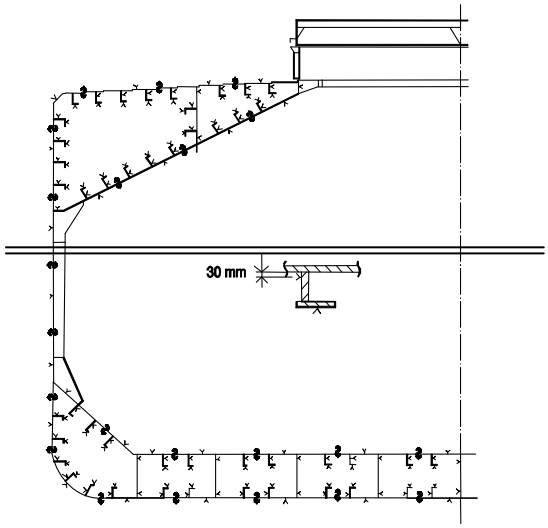
Fig. 1 to **Fig. 5** are provided to facilitate the explanations and/or interpretations given in **Table 2**, to show typical arrangements of single side skin bulk carriers and double side skin bulk carriers.

Table 2 Interpretations of rule requirements for the locations and number of points to be measured

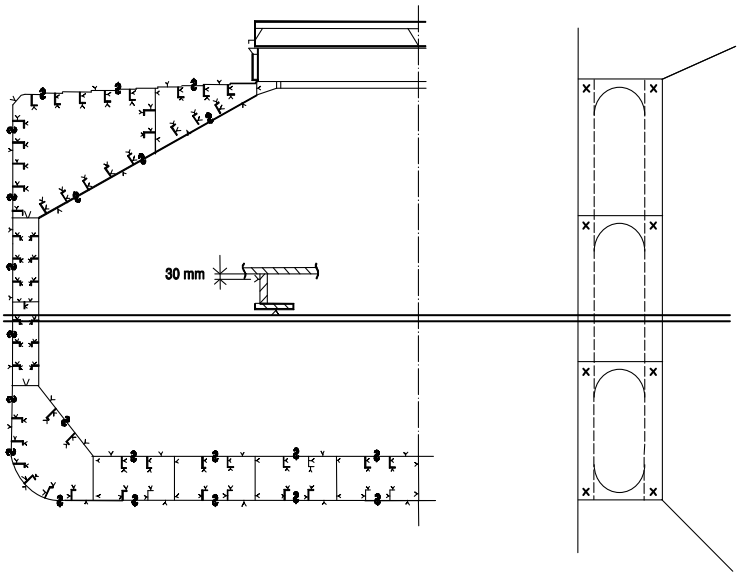
Item	Interpretation	Figure reference
Selected plates on deck, tank top, bottom, double bottom and wind and water area	«Selected» means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion	
All deck, tank top and bottom plates and wind and water strakes	At least two points on each plate to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion	
Transverse section	*Single side skin bulk carrier*: A transverse section includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom, hopper sides and top wing inner sides. *Double side skin bulk carrier*: A transverse section includes all longitudinal members such as plating, longitudinals and girders at the deck, sides, bottom, inner bottom, hopper sides, inner sides and top wind inner sides.	**Fig 1** for single and double side skin bulk carriers
Cargo hold hatch covers and coamings		**Fig 2**
Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, girders	The internal structural items to be measured in each space internally surveyed are to be at least 10% outside the cargo length area	–
Transverse section of deck plating outside line of cargo hatch openings	Two single points on each deck plate (to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion) between the ship sides and hatch coamings in the transverse section concerned	

Item	Interpretation	Figure reference
Selected areas of all deck plating inside line of hatch openings	«Selected» means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion «All deck plating» means at least two points on each plate to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion	Extent of areas is shown in *UR* Z10.2 for single side skin bulk carriers and *UR* Z10.5 for double side skin bulk carriers
Selected side shell frames in cargo holds for single side skin bulk carriers	25% of frames: one out of four frames should preferably be chosen throughout the cargo hold length on each side «Selected frames» means at least 3 frames on each side of cargo holds	Extent of areas is shown in *UR* Z10.2 for single side skin bulk carriers. Locations of points are given in **Fig 3** for single side skin bulk carriers
Transverse frame in double skin tank		**Fig 1**
Transverse bulkheads in cargo holds	Includes bulkhead plating, stiffeners and girders, including internal structure of upper and lower stools, where fitted. Two selected bulkheads: one is to be the bulkhead between the two foremost cargo holds and the second may be chosen in other positions	Areas of measurements are shown in *UR* Z10.2 for single side skin bulk carriers and *UR* Z10.5 for double side skin bulk carriers. Locations of points are given in **Fig 4.**
One transverse bulkhead in each cargo hold	This means that the close-up survey and related thickness measurements are to be performed on one side of the bulkhead; the side is to be chosen based on the outcome of the overall survey of both sides. In the event of doubt, the Surveyor may also require (possibly partial) close-up survey on the other side	Areas of measurements are shown in *UR* Z10.2 for single side skin bulk carriers and *UR* Z10.5 for double side skin bulk carriers. Locations of points are given in **Fig 4.**
Transverse bulkheads in one topside/side ballast tank	The ballast tank is to be chosen based on the history of ballasting among those prone to have the most severe conditions	Locations of points are given in **Fig 5**
Transverse webs in ballast tanks	One of the representative tanks of each type (i.e. topside or hopper or side tank) is to be chosen in the forward part	Extent of areas is shown in *UR* Z10.2 for single side skin bulk carriers and in *UR* Z10.5 for double side skin bulk carriers. Locations of points are given in **Fig 3.**

~~Fig. 1 – Transverse section of bulk carrier~~



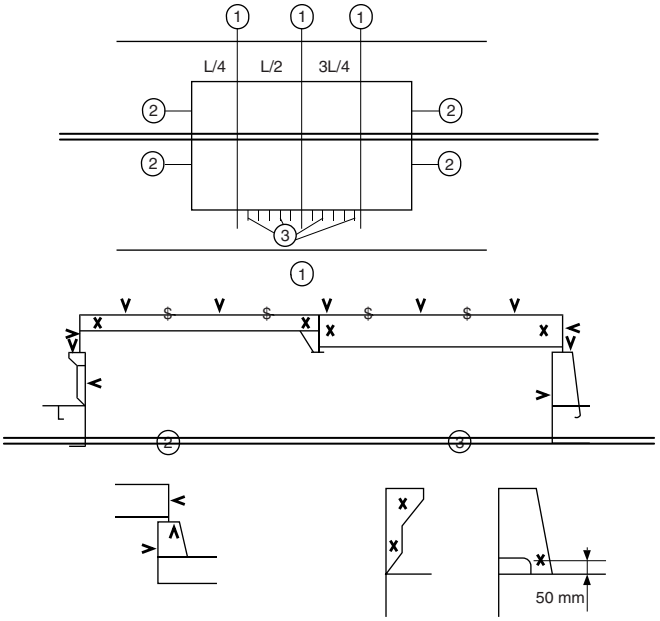
~~Single side bulk carriers~~



~~Double side bulk carrier~~

~~Note: Measurements are to be taken on both port and starboard sides of the selected transverse section.~~

~~Fig. 2 Locations of measurements on hatch covers and coamings~~



~~Notes :~~

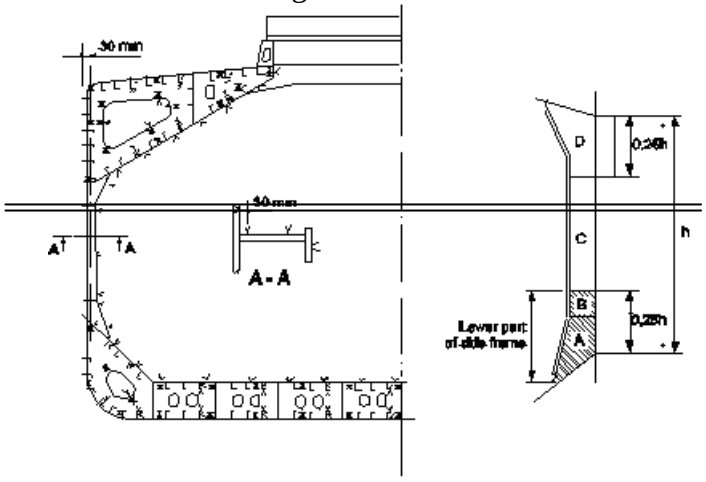
~~1. Three sections at $L/4$, $L/2$, $3L/4$ of hatch cover length, including:~~

- ~~one measurement of each hatch cover plate and skirt plate~~
- ~~measurements of adjacent beams and stiffeners~~
- ~~one measurement of coaming plates and coaming flange, each side~~

~~2. Measurements of both ends of hatch cover skirt plate, coaming plate and coaming flange~~

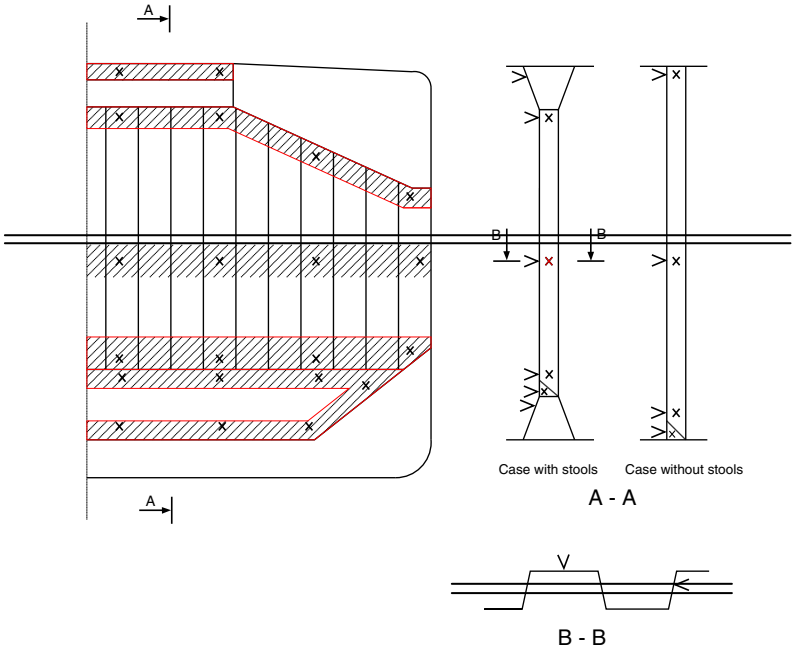
~~3. One measurement of one out of three hatch coaming brackets and bars, on both sides and both ends~~

~~Fig. 3 Locations of measurements on structural members in cargo holds and ballast tanks of single side skin bulk carriers~~



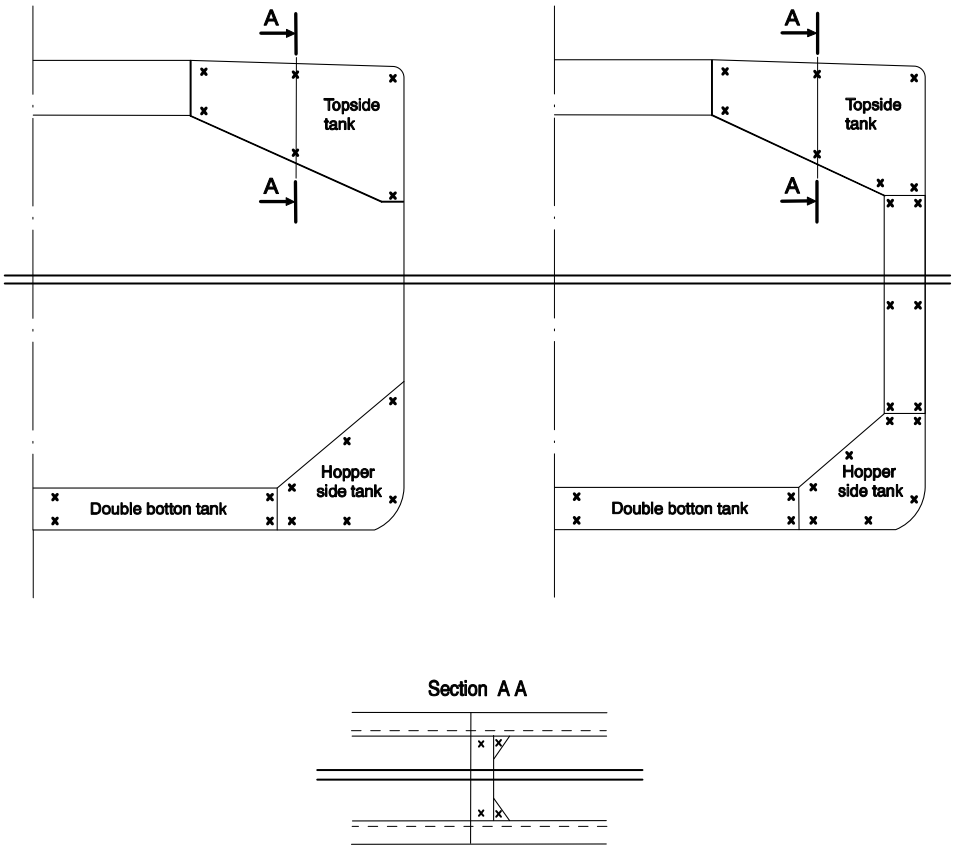
~~Note : The gauging pattern for web plating is to be a three point pattern for zones A, C and D, and a two point pattern for zone B (see figure). The gauging report is to reflect the average reading. The average reading is to be compared with the allowable thickness. If the web plating has general corrosion then this pattern is to be expanded to a five point pattern.~~

~~Fig. 4 — Locations of measurements on cargo hold transverse bulkheads~~



~~Note: — Measurements to be taken in each shaded area as per views A — A and B — B~~

~~Fig. 5 — Locations of measurements on transverse bulkheads of topside, hopper, double hull and double bottom tanks~~



~~Note: — Measurements to be taken in each vertical section as per view A — A~~

3. Acceptance Criteria

3.1 Definitions

3.1.1 Deck zone

The deck zone includes all the following items contributing to the hull girder strength above the horizontal strake of the topside tank or above the level corresponding to $0.9D$ above the base line if there is no topside tank:

- strength deck plating
- deck stringer
- sheer strake
- side shell plating
- top side tank sloped plating, including horizontal and vertical strakes
- longitudinal stiffeners connected to the above mentioned platings.

3.1.2 Bottom zone

The bottom zone includes the following items contributing to the hull girder strength up to the upper level of the hopper sloping plating or up to the inner bottom plating if there is no hopper tank:

- keel plate
- bottom plating
- bilge plate
- bottom girders
- inner bottom plating
- hopper tank sloping plating
- side shell plating
- longitudinal stiffeners connected to the above mentioned platings.

3.1.3 Neutral axis zone

The neutral axis zone includes the plating only of the items between the deck zone and the bottom zone, as for example:

- side shell plating
- inner hull plating, if any

3.2 Local strength criteria

3.2.1 Items for the local strength criteria

The items to be considered for the local strength criteria are those of the deck zone, the bottom zone and the neutral axis zone, as defined in **3.1**, and the additional following items:

- hatch coaming plating
- hatch coaming brackets
- hatch cover top plating
- hatch cover skirt plating
- hatch cover stiffeners
- transverse bulkheads plating
- transverse bulkheads stiffener web
- transverse bulkheads stiffener flange
- side shell frames web
- side shell frames flange
- side shell frames brackets

- web of topside and hopper tank web frames
- flange of topside and hopper tank web frames
- floors plating and stiffeners
- forward and aft peak bulkheads plating
- forward and aft peak bulkheads stiffener web
- forward and aft peak bulkheads stiffener flange
- stringers and girders.

3.2.2 Renewal thickness for corrosion other than local corrosion

For each item, steel renewal is required when the gauged thickness t_{gauged} is less than the renewal thickness, as specified in the following formula:

$$t_{gauged} < t_{renewal},$$

Where the gauged thickness t_{gauged} is such as:

$$t_{renewal} \leq t_{gauged} < t_{renewal} + t_{reserve}$$

coating applied in accordance with the coating manufacturer's requirements or annual gauging may be adopted as an alternative to the steel renewal. The coating is to be maintained in good condition.

3.2.3 Renewal thickness for local corrosion

If pitting intensity in an area where coating is required, according to **Ch 3, Sec 5,** is higher than 15% (see **Fig 6**), thickness measurements are to be performed to check the extent of pitting corrosion. The 15% is based on pitting or grooving on only one side of a plate.

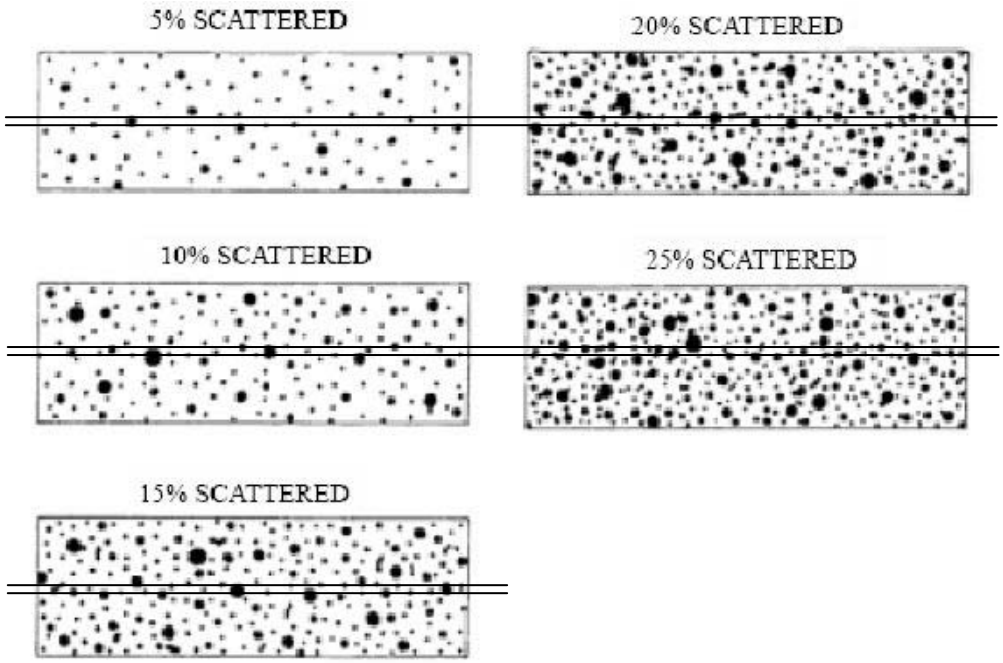
In cases where pitting is exceeding 15%, as defined above, an area of 300 *mm* or more, at the most pitted part of the plate, is to be cleaned to bare metal and the thickness is to be measured in way of the five deepest pits within the cleaned area. The least thickness measured in way of any of these pits is to be taken as the thickness to be recorded.

The minimum remaining thickness in pits, grooves or other local areas as defined in **Ch 13, Sec1, 1.2.1** is to be greater than:

- 75% of the as-built thickness, in the frame and end brackets webs and flanges
- 70% of the as-built thickness, in the side shell, hopper tank and topside tank plating attached to the each side frame, over a width up to 30 *mm* from each side of it,

without being greater than $t_{renewal}$.

Fig. 6 – Pitting intensity diagrams (from 5% to 25% intensity)



3.3 Global strength criteria

3.3.1 Items for the global strength criteria

The items to be considered for the global strength criteria are those of the deck zone, the bottom zone and the neutral axis zone, as defined in **3.1**.

3.3.2 Renewal thickness

The global strength criteria is defined by the assessment of the bottom zone, deck zone and neutral axis zone, as detailed below.

a) bottom zone and deck zone:

The current hull girder section modulus determined with the thickness measurements is not to be less than 90% of the section modulus calculated according to **Ch 5, Sec 1** with the gross offered thicknesses.

Alternatively, the current sectional areas of the bottom zone and of the deck zone which are the sum of the gauged items area of the considered zones, are not to be less than 90% of the sectional area of the corresponding zones determined with the gross offered thicknesses.

b) neutral axis zone:

The current sectional area of the neutral axis zone, which is the sum of the gauged platings area of this zone, is not to be less than 85% of the gross offered sectional area of the neutral axis zone.

If the actual wastage of all items, of a given transverse section, which contribute to the hull girder strength is less than 10% for the deck and bottom zones and 15% for the neutral axis zone, the global strength criteria of this transverse section is automatically satisfied and its checking is no more required.

Section 2 has been added as follows.

Section 2 ACCEPTANCE CRITERIA

Symbols

For symbols not defined in this Section, refer to **Ch 1**, **Sec 4**.

$t_{renewal}$: Renewal thickness; Minimum allowable thickness, in *mm*, below which renewal of structural members is to be carried out

$t_{renewal} = t_{as\_built} - t_C - t_{voluntary\_addition}$

$t_{reserve}$: Reserve thickness; Thickness, in *mm*, to account for anticipated thickness diminution that may occur during a survey interval of 2.5 *year* ($t_{reserve}$ = 0.5 *mm*)

t_C : Corrosion addition, in *mm*, defined in **Ch 3**, **Sec 3**

t_{as_built} : As built thickness, in *mm*, including $t_{voluntary\_addition}$, if any

$t_{voluntary\_addition}$: Voluntary thickness addition; Thickness, in *mm*, voluntarily added as the Owner's extra margin for corrosion wastage in addition to t_C

t_{gauged} : Gauged thickness, in *mm*, on one item, i.e average thickness on one item using the various measurements taken on this same item during periodical ship's in service surveys

1. Local strength criteria

1.1 Application

1.1.1

The items to be considered for the local strength criteria are those defined in the relevant requirement of **Part B**.

1.2 Renewal thickness for corrosion other than local corrosion

1.2.1

For each item, steel renewal is required when the gauged thickness t_{gauged} is less than the renewal thickness, as specified in the following formula:

$t_{gauged} < t_{renewal,}$

Where the gauged thickness t_{gauged} is such as:

$t_{renewal} < t_{gauged} < t_{renewal} + t_{reserve}$

coating applied in accordance with the coating manufacturer's requirements or annual gauging may be adopted as an alternative to the steel renewal. The coating is to be maintained in good condition.

1.3 Renewal thickness for local corrosion

1.3.1

If pitting intensity in an area where coating is required, according to **Ch 3**, **Sec 5**, is higher than 15% (see **Fig. 1**), thickness measurements are to be performed to check the extent of pitting corrosion. The 15% is based on pitting or grooving on only one side of a plate.

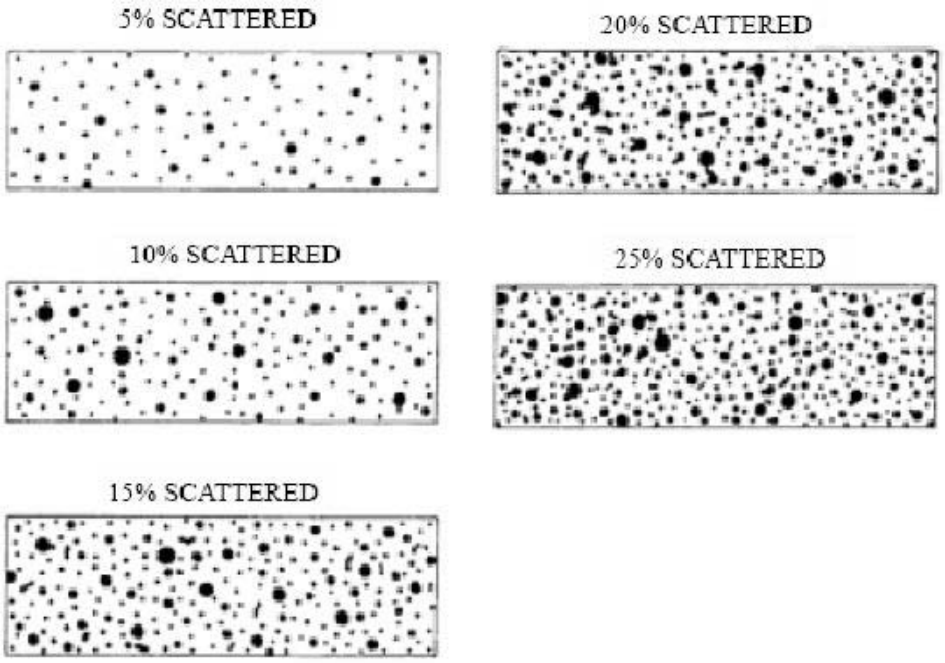
In cases where pitting is exceeding 15%, as defined above, an area of 300 *mm* or more, at the most pitted part of the plate, is to be cleaned to bare metal and the thickness is to be measured in way of the five deepest pits within the cleaned area. The least thickness measured in way of any of these pits is to be taken as the thickness to be recorded.

The minimum remaining thickness in pits, grooves or other local areas as defined in **Ch 13**, **Sec 1**, **1.2.1** is to be greater than:

- 75% of the as-built thickness, in the frame and end brackets webs and flanges
- 70% of the as-built thickness, in the side shell, hopper tank and topside tank plating attached to the each side frame, over a width up to 30 *mm* from each side of it,

without being greater than $t_{renewal}$.

Fig. 1 Pitting intensity diagrams (from 5% to 25% intensity)



1.4 Global strength criteria

1.4.1 Items for the global strength criteria

The items to be considered for the global strength criteria are those of the deck zone, the bottom zone and the neutral axis zone, as defined in **Ch 13**, **Sec 1**, **1.2**.

1.4.2 Renewal thickness

The global strength criteria is defined by the assessment of the bottom zone, deck zone and neutral axis zone, as detailed below.

a) bottom zone and deck zone:

The current hull girder section modulus determined with the thickness measurements is not to be less than 90% of the section modulus calculated according to **Ch 5**, **Sec 1** with the gross offered thicknesses.

Alternatively, the current sectional areas of the bottom zone and of the deck zone which are the sum of the gauged items area of the considered zones, are not to be less than 90% of the sectional area of the corresponding zones determined with the gross offered thicknesses.

b) neutral axis zone:

The current sectional area of the neutral axis zone, which is the sum of the gauged platings area of this zone, is not to be less than 85% of the gross offered sectional area of the neutral axis zone.

If the actual wastage of all items, of a given transverse section, which contribute to the hull girder strength is less than 10% for the deck and bottom zones and 15% for the neutral axis zone, the global strength criteria of this transverse section is automatically satisfied and its checking is no more required.

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 July 2012.

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 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.