



<b>SURVEY PROGRAMME for Double Skin Bulk Carriers (including Ore Carriers)</b>
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**Basic Information and Particulars**

Ship's name	:
IMO Number	:
Flag State	:
Port of Registry	:
Gross Tonnage	:
Deadweight (metric tonnes)	:
Length between perpendiculars (m)	:
Shipbuilder	:
Hull Number	:
Recognized Organization (RO)	: Nippon Kaiji Kyokai
RO Ship Identity (Class Number)	:
Date of delivery of the ship	:
Owner	:
Thickness Measurement Firm	:
Survey Place	:

Even if the Special Survey / Intermediate Survey is divided to commencement and completion, all survey items are to be listed in the program.

Prepared by the owner in co-operation with the Classification Society.

Survey programme is to be verified by NK surveyor prior to commencing Special Survey / Intermediate Survey.

Date :

( )  
(name and signature of authorized owner's representative)

Date :

( )  
Surveyor to Nippon Kaiji Kyokai  
Branch/Office

# 1 Preamble

## 1.1 Scope

1.1.1 The present Survey Programme covers the minimum extent of overall surveys, close-up surveys, thickness measurements and pressure testing within the cargo length area, cargo holds, ballast tanks, including fore and aft peak tanks, required by the NK Rules.

1.1.2 The arrangements and safety aspects of the survey shall be acceptable to the attending surveyor(s).

## 1.2 Documentation

All documents used in the development of the survey programme shall be available onboard during the survey.

# 2 Arrangement of Cargo holds, tanks and spaces

This section of the survey programme shall provide information (either in the form of plans or text) on the arrangement of cargo holds, tanks and spaces that fall within the scope of the survey.

Hold & Tank Arrangement\*/Hold & Tank List\*, which is attached to next page is to be referred.

(\*: Delete as appropriate)

# 3. List of cargo holds, tanks and spaces with information on their use, extent of coatings and corrosion protection system

This section of the survey programme shall indicate any changes relating to (and shall update) the information on the use of the cargo holds and ballast tanks of the ship, the extent of coatings and the corrosion prevention system provided in the Survey Planning Questionnaire.

Spaces	Fr. No	Corrosion Protection (1)	Coating Extent (2)	Coating Condition (3)

1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection; CS=clad steel; SS=stainless steel

2) U=upper part; M=middle part; L=lower part; C=complete

3) G=good; F=fair; P=poor, RC=recoated (during the last 3 years)

Hold & Tank Arrangement\*/Hold & Tank List\* (\*: Delete as appropriate)

## 4 Conditions for survey

This section of the survey programme shall provide information on the conditions for survey, e.g. information regarding cargo hold and tank cleaning, gas freeing, ventilation, lighting, etc.

- 4.1 The owner shall provide the necessary facilities for a safe execution of the survey.
- 4.2 In order to enable the attending surveyors to carry out the survey, provisions for proper and safe access shall be agreed between the owner and NK.
- 4.3 In cases where the provisions of safety and required access are judged by the attending surveyors not to be adequate, the survey of the spaces involved shall not proceed.
- 4.4 Cargo holds, tanks and spaces are to be safe for access. Cargo holds, tanks and spaces shall be gas free and properly ventilated. Prior to entering a tank, void or enclosed space, it shall be verified that the atmosphere in that space is free from hazardous gas and contains sufficient oxygen.
- 4.5 Cargo holds, tanks and spaces shall be sufficiently clean and free from water, scale, dirt, oil residues, sediments etc., to reveal corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating. In particular this applies to areas which are subject to thickness measurement.
- 4.6 Sufficient illumination shall be provided to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.
- 4.7 The attending surveyor(s) shall always be accompanied by at least one responsible person assigned by the Company experienced in tank and enclosed spaces inspection. In addition a backup team of at least two experienced persons shall be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team shall continuously observe the work in the tank or space and shall keep lifesaving and evacuation equipment ready for use.
- 4.8 Where Soft Coatings have been applied, safe access shall be provided for the surveyor to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures, which may include spot removal of the coating. When safe access cannot be provided, the soft coating shall be removed.
- 4.9 A communication system is to be arranged between the survey party in the tank or space being examined, the responsible officer on deck and, as the case may be, the navigation bridge. The communication arrangements are to be maintained throughout the survey. This system shall also include the personnel in charge of ballast pump handling if boats or rafts are used.
- 4.10 Survey at sea or at anchorage may be accepted provided the surveyor is given the necessary assistance from the personnel on board.

Complete cargo/ballast discharge to be confirmed by :

O<sub>2</sub> content measurement and gas detection to be confirmed by :

Cleanliness in cargo holds/ballast tanks to be confirmed by :

## 5 Provisions and method of access to structures

This section of the survey programme shall indicate any changes relating to (and shall update) the information on the provisions and methods of access to structures provided in the Survey Planning Questionnaire.

Hold/Tank No.	Structure	Permanent Means of Access	Temporary staging	Rafts	Ladders	Direct access	Other means (please specify)
<b>F.P.</b>	Fore Peak						
<b>A.P.</b>	Aft Peak						
<b>Cargo Holds</b>	Hatch side coamings						
	Topside sloping plate						
	Upper stool plating						
	Cross deck						
	Double side tank plating						
	Transverse bulkhead						
	Hopper tank plating						
	Lower stool plating						
	Tank top						
<b>Topside Tanks</b>	Underdeck structure						
	Side shell & structure						
	Sloping plate & structure						
	Webs & bulkheads						
<b>Hopper Tanks</b>	Hopper sloping plate & structure						
	Side shell & structure						
	Bottom structure						
	Webs & bulkheads						
<b>Double Side Tanks</b>	Side shell & structure						
	Inner skin & structure						
	Webs & bulkheads						
	Double bottom structure						
	Upper stool internal structure						
	Lower stool internal structure						
<b>Wing Tanks of Ore Carriers</b>	Underdeck & structure						
	Side shell & structure						
	Side shell vertical web & structure						
	Longitudinal bulkhead & structure						
	Longitudinal bulkhead web & structure						
	Bottom plating & structure						
	Cross ties/stringers						

Applicable access provisions are to be ticked.

- 5.1 For overall survey, means shall be provided to enable the surveyor to examine the structure in a safe and practical way.
- 5.2 For close-up surveys, one or more of the following means for access, acceptable to the surveyor, shall be provided:
- (1) For close-up surveys of the hull structure, other than cargo hold shell frames:
    - (a) Permanent staging and passages through structures
    - (b) Temporary staging and passages through structures
    - (c) Hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms
    - (d) Boats or rafts for ballast tanks and cargo tanks  
Boats or rafts may be applied to void spaces and other similar spaces provided the structural capacity of the space is sufficient to withstand static loads at all levels of water.
    - (e) Portable ladders
    - (f) Other equivalent means
  - (2) For close-up surveys of the cargo hold shell frames of bulk carriers less than 100,000DWT:
    - (a) Permanent staging and passages through structures
    - (b) Temporary staging and passages through structures
    - (c) Portable ladder restricted to not more than 5m in length may be accepted for surveys of lower section of a shell frame including bracket
    - (d) Hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms
    - (e) Boats or rafts provided the structural capacity of the hold (used for ballast) is sufficient to withstand static loads at all levels of water
    - (f) Other equivalent means
  - (3) For close-up surveys of the cargo hold shell frames of bulk carriers of 100,000DWT or more:
    - (a) For Intermediate Surveys (ships under 10 years of age) and Special survey No.1:
      - i) Permanent staging and passages through structures
      - ii) Temporary staging and passages through structures
      - iii) Hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms
      - iv) Boats or rafts provided the structural capacity of the hold (used for ballast) is sufficient to withstand static loads at all levels of water
      - v) Other equivalent means

Notwithstanding the above, the use of a portable ladder fitted with a mechanical device to secure the upper end of the ladder is acceptable for the close-up survey of side frames at Annual surveys. However, it is not acceptable for the close-up survey of suspect area identified at the previous survey or the ongoing survey.
    - (b) For Subsequent Intermediate Surveys (ships not less than 10 years of age) and Special surveys:
      - i) Permanent staging and passages through structures
      - ii) Temporary staging and passages through structures
      - iii) Hydraulic arm vehicles such as conventional cherry pickers for surveys of lower and middle part of side frames (However, the use of hydraulic arm vehicles or aerial lifts may be accepted by the attending surveyor for the close-up surveys of the upper parts of side shell frames or other structures in all cases where the maximum working height is not more than 17m.)
      - iv) Lifts and movable platforms
      - v) Boats or rafts provided the structural capacity of the hold (used for ballast) is sufficient to withstand static loads at all levels of water
      - vi) Other equivalent means
- 5.3 Surveys of tanks by means of boats or rafts may only be undertaken with the agreement of the surveyor, who shall take into account the safety arrangements provided, including weather forecasting and ship response in reasonable sea conditions.
- 5.4 When rafts or boats will be used for close-up survey conditions to keep safety and effectiveness shall comply with the equivalent criteria for the cases on tankers.

## 6 List of equipment for survey

This section of the survey programme shall identify and list the equipment that will be made available for carrying out the survey and the required thickness measurements.

The following safety equipment is available on board.

a) O<sub>2</sub> content meter / Type :

Accuracy to be checked by :

b) Gas detector / Type :

Accuracy to be checked by :

c) Portable Safety Light / No.: \_\_\_\_\_ sets of \_\_\_\_\_ type

d) Available breathing apparatus: \_\_\_\_\_ sets of \_\_\_\_\_ type

e) Other safety equipment, if any:

f) Are the other safety equipment also available at repair yard ? Yes / No

## 7 Survey requirements

### 7.1 Overall survey

This section of the survey programme shall identify and list the spaces that shall undergo a overall survey for this ship in accordance with the requirements of the Rules.

See, Appendix 3.1 – Overall Survey Requirements

.1 Cargo Hold

.2 Cofferdam

.3 Ballast Tank

.4 Peak Tank

.5 Fresh Water Tank

.6 Fuel Oil Tank

.7 Lubricating Oil Tank

.8 Machinery spaces and other Tanks/Spaces

## 7.2 Close-up survey

This section of the survey programme shall identify and list the hull structures that shall undergo a close up survey for this ship in accordance with the requirements of the Rules.

See, Appendix 3.2-1 – Close-up Survey Requirements (**excluding Ore Carriers**)

### .1 Ballast tank

Structural member	Tank
One T. Web in two representative tanks	
One T. Web in each tank	
All T. Webs in each tank	
Fwd & aft T. Bhds of tanks in a transverse section on one side of the ship	
All T. Bhds in each tank	
At least 1/4 of stiffeners on S. Shell and L. Bhd at fwd, mid and aft parts on both sides of the foremost double side tanks	
At least 1/4 of stiffeners on S. Shell and L. Bhd at fwd, mid and aft parts on both sides of all double side tanks	
All stiffeners on S. Shell and L. Bhd in all double side tanks	

### .2 Cargo hold

Structural member	Hold
Two T. Bhds	
One T. Bhd in each hold	
All T. Bhds in all holds	
All cross deck	
Air pipes and sounding pipes i.w.o. tank top	
All piping arrangements	
All hatch cover and hatch coaming	



See, Appendix 3.2-2 – Close-up Survey Requirements for **Ore Carriers**

.1 Ballast tank

Structural member	Tank
One web frame rings in a wing tank	
All web frame rings in a wing tank	
All web frame rings in each tank	
One deck transverse in each remaining tank	
Lower part of one T. Bhd in a tank	
Fwd & aft T. Bhds in a wing tank	
Lower part of one T. Bhd in each remaining tank	
All T. Bhds in each tank	

.2 Cargo hold

Structural member	Hold
Two T. Bhds	
One T. Bhd in each hold	
All T. Bhds in each hold	
All cross deck	
Air pipes and sounding pipes i.w.o. tank top	
All piping arrangements	
All hatch cover and hatch coaming	

.3 Wing Void Space

Structural member	Space
One web frame ring in each space	
Other web frame rings	

**8 Identification of tanks for tank testing**

This section of the survey programme shall identify and list the cargo holds and tanks that shall undergo tank testing for this ship in accordance with the Rules.

See, Appendix 3.3 – Tank Testing Requirements

Ballast Hold	
Ballast Tank	
Fresh Water Tank	
Other Water Tank	
Deep Tank	
Fuel Oil Tank	
Lubrication Oil Tank	

## **9 Minimum thickness of hull structures**

This section of the survey programme shall specify the minimum thickness for hull structures of this ship that are subject to the Guidelines (indicate either (a) or preferably (b), if such information is available):

- (a)  Determined from the attached\* wastage allowance table and the original thickness on the hull structure plans of the ship;
- (b)  Given in the following table(s)

\*: The wastage allowance table shall be attached to the survey programme.

See, Appendix 3.5 – The Wastage Allowance

## **10 Thickness measurement firm**

This section of the survey programme shall identify changes, if any, relating to the information on the thickness measurement firm provided in the Survey Planning Questionnaire.

## 11 Identification of areas and sections for thickness measurements

This section of the survey programme shall identify and list the areas and sections where thickness measurements shall be taken in accordance with the Rules.

See, Appendix 3.4 – Thickness Measurement Requirements / Appendix 3.6 - Interpretations of rule requirements for the number and location of thickness measurements for CSR bulk carriers

Location	TM requirements
Suspect area	<i>To be described if applicable</i>
Structural members subject to close-up survey	<i>Refer to Section 7.2</i>
Transverse section	<input type="checkbox"/> 2 sections <input type="checkbox"/> 3 sections
Deck plating	<input type="checkbox"/> all strength deck where log cargoes, etc. are loaded within the cargo length area <input type="checkbox"/> each deck outside cross deck within the cargo length area <input type="checkbox"/> all exposed main deck outside the cargo length area <input type="checkbox"/> representative exposed superstructure deck
Wind and water strakes	<input type="checkbox"/> i.w.o. the two transverse section above <input type="checkbox"/> selected outside the cargo length area <input type="checkbox"/> all within the cargo length area <input type="checkbox"/> all
Side shell plating	<input type="checkbox"/> Sea chests <input type="checkbox"/> i.w.o. overboard discharges
F.P.T. & A.P.T.	<input type="checkbox"/> internals
Bottom plate	<input type="checkbox"/> each plate within the cargo length area <input type="checkbox"/> full length of all keel plates <input type="checkbox"/> appropriate number of plates in way of cofferdams, machinery space and aft end of tanks
Others	

**12 Damage experience related to the ship**

This section of the survey programme shall provide details of the hull damages for at least the last three years in way of the cargo holds, ballast tanks and void spaces within the cargo area, using the tables provided below. These damages are subject to survey.

**Hull damages sorted by location for this ship**

<b>Cargo Hold, Tank or space number or area</b>	<b>Possible cause, if known</b>	<b>Description of the damages</b>	<b>Location</b>	<b>Repair</b>	<b>Date of repair</b>

**Hull damages for sister or similar ships (if available) in the case of design related damage**

<b>Cargo Hold, Tank or space number or area</b>	<b>Possible cause, if known</b>	<b>Description of the damages</b>	<b>Location</b>	<b>Repair</b>	<b>Date of repair</b>

### **13 Areas identified with substantial corrosion from previous surveys**

This section of the survey programme shall identify and list the areas of substantial corrosion from previous surveys.

### **14 Critical structural areas and suspect areas**

This section of the survey programme shall identify and list the critical structural areas and the suspect areas, when such information is available.

### **15 Other relevant comments and information**

This section of the survey programme shall provide any other comments and information relevant to the survey.

## **Appendices**

### **Appendix 1 - List of Plans**

*The Rules require that main structural plans of cargo holds and ballast tanks (scantling drawings), including information regarding use of high tensile steel (HTS) shall be available. This appendix of the survey programme shall identify and list the main structural plans which form part of the survey programme.*

### **Appendix 2 - Survey Planning Questionnaire**

*The Survey Planning Questionnaire, which has been submitted by the owner, shall be appended to the survey programme.*

### **Appendix 3 - Other documentation**

*This part of the survey programme shall identify and list any other documentation that forms part of the survey programme.*

- .1 Overall Survey Requirements**, as referred to Paragraph 7.1 “Overall survey” is attached to this survey programme.
- .2 Close-up Survey Requirements**, as referred to Paragraph 7.2 “Close-up survey” is attached to this survey programme.
- .3 Tank Testing Requirements**, as referred to Paragraph 8 “Identification of tanks for tank testing” is attached to this survey programme.
- .4 Thickness Measurement Requirements**, as referred to Paragraph 11 “Identification of areas and sections for thickness measurements” is attached to this survey programme.
- .5 The Wastage Allowance**, as referred to Paragraph 9 “Minimum thickness of hull structures” is attached to this survey programme.

## Appendix 1 - List of Plans

- 1. Basic ship information and particulars;**  
See, attached survey status
- 2. Main structural plans of cargo holds and ballast tanks (scantling drawings), including information regarding use of high tensile steels (HTS);**
  - Midship Section and Typical Trans. BHD
  - Construction Profile & Decks
  - Shell Expansion (Fore & Aft)
  - Transverse Bulkheads
  - Forward Construction
  - Afterward Construction
- 3. Arrangements of Tanks;**
  - General Arrangement
- 4. List of tanks with information on their use, extent of coatings and corrosion protection systems;**  
See, paragraph 3 of SURVEY PROGRAMME.
- 5. Conditions for survey (e.g. information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);**  
See, paragraph 4 of SURVEY PROGRAMME.
- 6. Provisions and methods for access to structures;**  
See, paragraph 5 of SURVEY PROGRAMME.
- 7. Equipment for survey;**  
See, paragraph 6 of SURVEY PROGRAMME.
- 8. Identification of tanks and areas for the close-up survey;**  
See, paragraph 7.2 of SURVEY PROGRAMME.
- 9. Identification of areas and sections for thickness measurement;**  
See, paragraph 11 of SURVEY PROGRAMME.
- 10. Identification of tanks for tank testing;**  
See, paragraph 8 of SURVEY PROGRAMME and General Arrangement.
- 11. Identification of the thickness measurement firm;**  
See, paragraph 10 of SURVEY PROGRAMME.
- 12. Damage experience related to the ship;**  
See, paragraph 12 of SURVEY PROGRAMME.
- 13. Critical Structural and Suspect Areas, where relevant;**  
See, paragraph 14 of SURVEY PROGRAMME.



## Appendix 2 - SURVEY PLANNING QUESTIONNAIRE

The following information will enable the owner in co-operation with ClassNK to develop a survey programme complying with the requirements of the Rules. It is essential that the owner provides, when completing the present questionnaire, up-to-date information. The present questionnaire, when completed, will provide all the information and material required by the Rules.

### Particulars

Ship's name	:
IMO number	:
Flag State	:
Port of registry	:
Owner	:
RO ship identity (Class Number)	:
Gross tonnage	:
Deadweight (metric tonnes)	:
Date of delivery	:

## Information on access provision for close-up surveys and thickness measurement

The owner shall indicate, in the table below, the means of access to the structures subject to close-up survey and thickness measurement. A close-up survey is an examination where the details of structural components are within the close visual inspection range of the attending surveyor, i.e. preferably within reach of hand.

Table SPQ1

Hold/Tank No.	Structure	Permanent Means of Access	Temporary staging	Rafts	Ladders	Direct access	Other means (please specify)
<b>F.P.</b>	Fore Peak						
<b>A.P.</b>	Aft Peak						
<b>Cargo Holds</b>	Hatch side coamings						
	Topside sloping plate						
	Upper stool plating						
	Cross deck						
	Double side tank plating						
	Transverse bulkhead						
	Hopper tank plating						
	Lower stool plating						
	Tank top						
<b>Topside Tanks</b>	Underdeck structure						
	Side shell & structure						
	Sloping plate & structure						
	Webs & bulkheads						
<b>Hopper Tanks</b>	Hopper sloping plate & structure						
	Side shell & structure						
	Bottom structure						
	Webs & bulkheads						
<b>Double Side Tanks</b>	Side shell & structure						
	Inner skin & structure						
	Webs & bulkheads						
	Double bottom structure						
	Upper stool internal structure						
	Lower stool internal structure						
<b>Wing Tanks of Ore Carriers</b>	Underdeck & structure						
	Side shell & structure						
	Side shell vertical web & structure						
	Longitudinal bulkhead & structure						
	Longitudinal bulkhead web & structure						
	Bottom plating & structure						
	Cross ties/stringers						

Applicable access provisions are to be ticked.

<b>History of bulk cargoes of a corrosive nature (e.g. high sulphur content)</b>
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## Owner's inspections

Using a format similar to that of the table below (which is given as an example), the owner shall provide details of the results of their inspections, for the last 3 years on all cargo holds and ballast tanks and void spaces within the cargo area, including peak tanks.

Table SPQ2

Hold or Tank No.	Corrosion protection (1)	Coating extent (2)	Coating condition (3)	Structural deterioration (4)	Hold and Tank damage history (5)
<b>Cargo holds</b>					
<b>Topside tanks</b>					
<b>Hopper tanks</b>					
<b>Double side skin tanks</b>					
<b>Upper stools</b>					
<b>Lower stools</b>					
<b>Wing tanks (Ore Carriers)</b>					
<b>Fore peak</b>					
<b>Aft peak</b>					
<b>Miscellaneous other spaces</b>					

Note: Indicate tanks which are used for oil/ballast

- 1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection;
- 2) U=upper part; M=middle part; L=lower part; C=complete
- 3) G=good; F=fair; P=poor; RC=recoated (during the last 3 years)
- 4) N= no findings recorded; Y= findings recorded, description of findings is to be attached to the questionnaire
- 5) DR=damage & repair; L= Leakages; CV= Conversion (description shall be attached to this questionnaire)

Name of owner's representative:

Signature:

Date:

**Reports of Port State Control inspections**

List the reports of Port State Control inspections containing hull structural related deficiencies and relevant information on the rectification of the deficiencies:

**Safety Management System**

List non-conformities related to hull maintenance, including the associated corrective actions:

**Name and address of the approved thickness measurement firm**


**Other information**

## Appendix 3.1 – Overall Survey Requirements

### Overall survey requirements for Special Survey No.1

1. All tanks and spaces except fuel oil tanks, lubricating oil tanks and fresh water tanks which are not peak tanks.

### Overall survey requirements for Special Survey No.2

1. All tanks and spaces (other than fuel oil tanks in engine rooms and lubricating oil tanks which are not peak tanks.) (See Remark 1)

### Overall survey requirements for Special Survey No.3

1. All tanks and spaces (other than lubricating oil tanks which are not peak tanks) (See Remark 2)

### Overall survey requirements for Special Survey No.4 and subsequent Special Surveys

1. All tanks and spaces (other than cargo tanks of ships carrying liquefied gases in bulk) (See Remark 3)

#### Notes:

- When internal examinations are carried out, the means of access provided for the examinations are also to be examined.
- Ballast tanks (excluding double bottom tanks) where the protective coating is found in poor condition and has not been renewed or where a protective coating has not been applied, internal examinations are to be carried out at annual intervals. For double bottom ballast tanks in this condition, internal examinations are to be carried out at annual intervals where considered necessary by the Surveyor.
- For holds insulated for the carriage of refrigerated cargo, limber boards and cover plates are to be removed and an examination of the inside is to be carried out. In addition, an examination behind the insulation is to be carried out at representative locations. The examination may be limited to verification that the protective coating remains effective and that there are no visible structural defects. Where the protective coating is found to be in a poor condition, the examination is to be extended as deemed necessary by the Surveyor.
- Ballast tanks converted to void spaces are to be examined in accordance with the provisions for ballast tanks.

#### Remarks:

- 1 If fuel oil tanks and fresh water tanks which are not peak tanks have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced. In such cases, internal examinations are to be carried out on the following tanks for at least the designated number of tanks:
  - (1) Fuel oil tanks fitted within cargo length areas (within cargo areas for tankers): 1 tank
  - (2) If no fuel oil tanks are fitted within cargo length areas (within cargo areas for tankers), fuel oil tanks fitted at locations other than engine rooms (if fitted): 1 tank
  - (3) Fresh water tanks: 1 tank
- 2 If fuel oil tanks which are not peak tanks have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced. In such cases, internal examinations are to be carried out on the following tanks for at least the designated number of tanks:
  - (1) Fuel oil tanks fitted within engine rooms: 1 tank
  - (2) Fuel oil tanks fitted within cargo length areas (within cargo areas for tankers): 2 tanks (In cases where deep fuel oil tanks are provided, one or more deep fuel oil tanks are to be included.)

- (3) If no fuel oil tanks are fitted within cargo length areas (within cargo areas for tankers), fuel oil tanks fitted at locations other than engine rooms (if fitted): 1 tank
- 3 If fuel oil tanks and lubricating oil tanks which are not peak tanks have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced. In such cases, internal examinations are to be carried out on the following tanks for at least the designated numbers of tanks:
- (1) Fuel oil tanks fitted within engine room: 1 tank
  - (2) Fuel oil tanks fitted within cargo length areas (for tankers, within cargo areas): half the total number of tank, but not less than 2 tanks. (in cases where deep fuel oil tanks are provided, one or more deep tanks are to be included.)
  - (3) If no fuel oil tanks are fitted within cargo length areas (within cargo areas for tankers), fuel oil tanks fitted at location other than engine rooms (if fitted): 2 tanks
  - (4) Lubricating oil tanks: 1 tank

## Appendix 3.2-1 – Close-up Survey Requirements (excluding Ore Carriers)

<b>Close-up survey requirements for Special Survey No.1</b>	
1.	Two selected cargo hold transverse bulkheads (including stiffeners and girders) (C)
2.	One transverse web with associated plating and longitudinals in two representative ballast tanks of each type (this is to include the foremost topside and double side ballast tanks on either side) (B)
3.	Air pipes and sounding pipes in cargo holds in way of tank top
4.	All hatch cover plating, hatch coaming plating, and stiffeners

<b>Close-up survey requirements for Special Survey No.2</b>	
1.	One transverse bulkhead in each cargo hold (including stiffeners and girders) (C)
2.	One transverse web with associated plating and longitudinals in each ballast tank (B)
3.	Both forward and aft transverse bulkheads (including stiffeners and girders) in a transverse section including topside, bilge hopper and double side ballast tanks on one side of the ship (B)
4.	A sufficient number (at least 1/4 of total number) of stiffeners (ordinary transverse frames for transverse framing systems or longitudinals for longitudinal framing systems) on side shell and longitudinal bulkhead at forward, middle, and aft parts on both sides of the foremost double side tanks (A)
5.	All deck plating and under deck structure inside the line of hatch openings between cargo hold hatches
6.	All piping arrangements in cargo holds. If the surveyor considers it necessary, airtight tests are to be carried out.
7.	All hatch cover plating, hatch coaming plating, and stiffeners

<b>Close-up survey requirements for Special Survey No.3</b>	
1.	All transverse bulkheads (including stiffeners and girders) in all cargo holds (C)
2.	All transverse webs with associated plating and longitudinals and all transverse bulkheads (including stiffeners and girders) in each ballast tank (B)
3.	A sufficient number (at least 1/4 of total number) of stiffeners (ordinary transverse frames for transverse framing systems or longitudinals for longitudinal framing systems) on side shell and longitudinal bulkhead at forward, middle, and aft parts on both sides of all double side tanks (A)
4.	Structural members specified in 5. to 7. of Special Survey No.2 above

<b>Close-up survey requirements for Special Survey No.4 and subsequent Special Surveys</b>	
1.	All stiffeners (ordinary transverse frames for transverse framing systems or longitudinals for longitudinal framing systems) on side shell and longitudinal bulkhead in all double side tanks (A)
2.	Structural members specified in 1., 2. and 4. of Special Survey No.3 above

Notes:

- 1 Letters in this table mean:
  - (A): Cargo hold transverse frames, or stiffeners (ordinary transverse frames for transverse framing systems or longitudinals for longitudinal framing systems) on side shell or longitudinal bulkhead in double side tanks
  - (B): Transverse web or watertight transverse bulkhead in fore and aft peak, topside, bilge hopper, double side ballast tanks and double bottom tanks including adjacent structural members
  - (C): Including plating and internal structures of lower and upper stools, where fitted
- 2 Close-up Surveys of transverse bulkheads are to be carried out at least at four levels as specified as follows:
  - (i) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.



- (ii) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
  - (iii) About mid-height of the bulkhead.
  - (iv) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.
- 3 A double side tank of double skin bulk carriers is to be considered as a separate tank even if it is in connection to either the topside tank or the bilge hopper tank.
- 4 Close-up surveys are to be carried out for the accessible parts of cargo hold hatch covers whose internals are impossible to structurally access.

## Appendix 3.2-2 – Close-up Survey Requirements for Ore Carriers

<b>Close-up survey requirements for Special Survey No.1</b>
1. One web frame rings in a ballast wing tank (A)
2. Lower part of one transverse bulkhead in a ballast tank (D)
3. Two selected cargo hold transverse bulkheads (including stiffeners and girders) (E)
4. Air pipes and sounding pipes in cargo holds in way of tank top
5. All hatch cover plating, hatch coaming plating, and stiffeners

<b>Close-up survey requirements for Special Survey No.2</b>
1. All web frame rings in a ballast wing tank (A)
2. One deck transverse in each remaining ballast tank (B)
3. Forward and aft transverse bulkheads in a ballast wing tank (C)
4. Lower part of one transverse bulkhead in each remaining ballast tank (D)
5. One transverse bulkhead in each cargo hold (including stiffeners and girders) (E)
6. All deck plating and under deck structure inside line of hatch openings between cargo hold hatches
7. All piping arrangements in cargo holds. If the surveyor considers it necessary, airtight tests are to be carried out.
8. All hatch cover plating, hatch coaming plating, and stiffeners

<b>Close-up survey requirements for Special Survey No.3</b>
1. All web frame rings in each ballast tank (A)
2. All transverse bulkheads in each ballast tank (C)
3. One web frame ring in all in each wing void space (A). However, additional close-up surveys may be carried out for other web frame rings in void spaces as deemed necessary by the Surveyor.
4. All transverse bulkhead in each cargo hold (including stiffeners and girders) (E)
5. Structural members specified in 6. to 8. of Special Survey No.2 above

<b>Close-up survey requirements for Special Survey No.4 and subsequent Special Surveys</b>
As for Special Survey No.3

**Notes:**

- 1 Letters in this table mean:
  - (A): Cross Ties and complete transverse web frame rings including adjacent structural members such as shell plating, longitudinal bulkheads, longitudinal stiffeners, brackets, etc.
  - (B): Including deck structures adjacent to deck transverse such as deck plating, longitudinal stiffeners, brackets, etc.
  - (C) and (D): Including vertical and horizontal girders, and adjacent structural members such as longitudinal bulkheads, inner bottom plating, hopper plating, bottom girders, brackets, stiffeners, etc.
  - (E): Including plating and internal structures of lower and upper stools, where fitted
- 2 Close-up Surveys of transverse bulkheads are to be carried out at least at four levels as specified as follows:
  - (i) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
  - (ii) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
  - (iii) About mid-height of the bulkhead.
  - (iv) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

- 3 Close-up surveys are to be carried out for the accessible parts of cargo hold hatch covers whose internals are impossible to structurally access.

### Appendix 3.3 – Tank Testing Requirements

<b>Tank testing requirements for All Special Surveys</b>	
1.	All boundaries of ballast tanks, deep tanks and cargo holds used for ballast within the cargo length area
2.	Representative fuel oil tanks within the cargo length area. When deemed appropriate by the Society, pressure tests may be specially considered.
3.	All water tanks Pressure tests of fresh water tanks may be specially considered when deemed appropriate by the Society.
4.	All fuel oil tanks outside the cargo length area Pressure tests may be specially considered when deemed appropriate by the Society.
5.	All lubrication oil tanks Pressure tests may be specially considered when deemed appropriate by the Society.

Notes:

- 1 A pressure test is to be carried out under the pressure specified below:
  - (a) For tanks: the pressure corresponding to the maximum head that can be experienced in service
  - (b) For piping: the working pressure
- 2 A pressure test of tanks may be carried out when the ship is afloat, provided that an internal examination of the bottoms of the tanks has also been carried out while afloat.
- 3 For ships having many water tanks and oil tanks, some of the tanks may be exempted from a pressure test where deemed appropriate by the Surveyor taking into account the ship's present condition, age and interval from the previous test.
- 4 Any testing of double bottom tanks and other watertight compartments not designed to carry liquids may be omitted, provided that satisfactory internal and/or external examinations are carried out.
- 5 Bilge, sludge and other similar tanks are to comply with the requirements for fresh water tanks
- 6 Pressure tests of air pipes, sounding pipes, and other pipes may be required where deemed necessary by the Surveyor as a result of examinations.
- 7 "In cases where deemed appropriate by the Society" means that satisfactory external examinations of tank boundaries and confirmations from Masters stating that all pressure testing has been carried out according to the requirements with satisfactory results.

### Appendix 3.4 – Thickness Measurement (hereinafter, TM) Requirements

<b>TM Requirements for Special Survey No.1</b>	
1.	Suspect areas
2.	At least structural members subject to close-up survey for general assessment and recording of corrosion pattern

<b>TM Requirements for Special Survey No.2</b>	
1.	Suspect areas
2.	Structural members within the cargo length area: <ul style="list-style-type: none"> <li>(1) Two transverse sections of deck plating, outside the line of cargo hatch openings</li> <li>(2) All strength deck plating, where log cargoes or other cargoes that are prone to accelerate corrosion are loaded</li> </ul>
3.	At least structural members subject to close-up survey for general assessment and recording of corrosion pattern
4.	Wind and water strakes in way of the transverse sections of 2.(1) above
5.	Selected wind and water strakes outside the cargo length area

<b>TM Requirements for Special Survey No.3</b>	
1.	Suspect areas
2.	Structural members within the cargo length area: <ul style="list-style-type: none"> <li>(1) Each deck plating outside the line of cargo hatch openings</li> <li>(2) Two transverse sections, one in the midship area, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included.</li> </ul>
3.	At least structural members subject to close-up survey for general assessment and recording of corrosion pattern
4.	Internals in fore and aft peak tanks
5.	All wind and water strakes within the cargo length area
6.	Selected wind and water strakes outside the cargo length area

<b>TM Requirements for Special Survey No.4 and subsequent Special Surveys</b>	
1.	Suspect areas
2.	Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Three transverse sections, one in the midship area, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate
3.	At least structural members subject to close-up survey for general assessment and recording of corrosion pattern
4.	Internals in fore and after peak tanks
5.	All exposed main deck plating outside the cargo length area
6.	Representative exposed superstructure deck plating (poop, bridge and forecastle deck)
7.	All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks
8.	Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor)
9.	All wind and water strakes

Notes:

- 1 The surveyor may extend the thickness measurements as deemed necessary.
- 2 Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken.
- 3 Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements. Where two or more transverse sections are required to be measured, one of them, at least, is to be a part of the water ballast tanks arranged just below upper deck within 0.5L amidships.
- 4 As for thickness measurements on frames and brackets, the measuring points are to be generally within 30 mm from fillet welding with shell or slant plates.

### Appendix 3.5 - The Wastage Allowance

(1) Principal structural hull members

- (i) The wastage allowance (diminution limits) for plates and stiffeners are shown in the following **Table 3.5-1**.
- (ii) The wastage allowance for longitudinal strength members given in the following **Table 3.5-1** are based on the condition that the diminution limit of longitudinal strength of the hull has not been reached.
- (iii) The values of the wastage allowance indicate limit values in case of uniform wear of members.
- (iv) Notwithstanding the following **Table 3.5-1**, the wastage allowance for local corrosion such as stress corrosion and pitting are to be decided at the discretion of the Surveyor. The standard diminution limit for local corrosion other than stress corrosion is to be taken as 40% of the original thickness.
- (v) Notwithstanding the following **Table 3.5-1**, the wastage allowance for the ships subject to the retroactive requirements for existing bulk carrier is to be assessed ship by ship.

**Table 3.5-1**

Structural Member	Wastage Allowance
<ul style="list-style-type: none"> <li>- Shell plates</li> <li>- Strength deck plates</li> <li>- Longitudinal beams (flat bar) on shear strake and strength deck</li> <li>- Tight bulkheads in deep tanks*<sup>1</sup></li> <li>- Inner bottom plates</li> </ul>	20% of original thickness + 1 mm
<ul style="list-style-type: none"> <li>- Floors and girders in double bottom</li> <li>- Primary members (web &amp; face)</li> <li>- Web, face and bracket of hold frames</li> <li>- Watertight bulkhead plates</li> </ul>	25% of original thickness
<ul style="list-style-type: none"> <li>- Web and face of frames (excluding hold frames), longls beams, stiffeners and brackets</li> <li>- Effective deck plates</li> <li>- Hatch cover and hatch beam</li> </ul>	30% of original thickness

\*<sup>1</sup> The deep tank is a tank used for carriage of water, oil and other liquids, forming a part of the hull in holds or tween decks.

(2) Minimum thickness for high tensile steel members

If high-tensile steel is used in bottom longitudinals of tankers with a single bottom construction, the wear and tear limit of the web is taken as 25% of the original thickness. If high-tensile steel is used in other structural members, the wear and tear limit is to be in accordance with (1) and (2) above.

(3) Measure against corrosion

When remarkable corrosion is found in the results of thickness measurement, the Surveyor shall examine the pattern and extent of the corrosion through intensive inspection or thickness measurement and take a necessary measure such as (i) & (ii) below. Where *substantial corrosion* is found, the additional thickness measurement is required. **Substantial corrosion is an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of allowable margins, but within acceptable limits. Notwithstanding the above, for the following (a) to (c), “substantial corrosion” is an extent of corrosion such that the assessment of the corrosion pattern indicates a gauged (or measured) thickness between the thickness obtained by adding 0.5(mm) to the renewal thickness and the renewal thickness. “Renewal thickness” refers to the minimum allowable thickness below which the renewal of structural members is to be carried out. (1.3.1(6), Part B of the Rules)**

- (a) For ships complying with the provisions of Part CSR-B and, Part CSR-T or Part CSR-B&T.

- (b) For hatch covers and hatch coamings for cargo holds of the ships stipulated otherwise by the Society. (below (4) to be referred to)
- (c) For transverse watertight bulkheads in cargo hold complying with the provision of Chapter 31A, Part C or Chapter 31B, Part C. (below (4) to be referred to)

- (i) Corrosion exceeding acceptable limit  
The Surveyor shall require repair such as renewal of the corroded plate exceeding acceptable limit. However, special consideration may be given for structural members whose actual scantling surpasses much the Rule requirements.
- (ii) *Substantial corrosion*  
Necessary instruction for further inspection of corrosion which does not exceed acceptable limit, but where continuous monitoring is deemed necessary shall be given. *Substantial corrosion* is to be nominated as *suspect area* and thickness measurement and necessary inspections of the area is to be carried out at subsequent Survey (Annual, Intermediate and Special Survey).

(4) Structural members stipulated in 1.3.1(6), Part B of the Rules <sup>(Note)</sup>

(Note) : The ships having subject members, the survey status shows description in Special Attention for Surveys as follows

**“T NET” CONCEPT APPLIED TO THE FOLLOWING MEMBERS**

- (a) Ships complying with the provisions of Rules Part CSR-B, Part CSR-T or Part CSR-B&T  
Notwithstanding (b) through (e) below, the renewal thickness for each structural element is indicated in the structural drawings.
- (b) Hatch covers and hatch coamings for cargo holds
  - (i) For hatch covers located forward of  $0.25 L_1$ \*<sup>1</sup> from the forward end of  $L_1$  of bulk carriers which are contracted for construction on or after 1 July 1998 and prior to 1 January 2004 and are at a beginning stage of construction\*<sup>2</sup> prior to 1 January 2005, the renewal thickness is given by the following formula.

$$t_{\text{renewal}} = t_{\text{as-built}} - t_c + 0.5 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

$t_c$ : Corrosion addition specified in **Table 3.5-2**

\*1 :  $L_1$  is the length of ship specified in 2.1.2 of Rules Part A or 0.97 times the length of ship on the designed maximum load line, whichever is smaller (m).

\*2 : Ships at beginning stage of construction specified in 2.1.44 of Rules Part A

**Table 3.5-2**

		Corrosion addition $t_c$ (mm)	
Steel Hatch Cover	Type of structure	For top, side and bottom plating	For internal structures
	Single plating type	2.0	
	Double plating type	2.0	1.5

- (ii) For all hatch covers and hatch coamings of bulk carriers which are contracted for construction on or after 1 January 2004 or are at the beginning stage of construction on or after 1 January 2005; or ships other than bulk carriers which are at the beginning stage of construction on or after 1 January 2005 and that have the application for Classification Survey during Construction submitted to the Society prior to 10 June 2005, the renewal thickness is given by the following formula.

$$t_{\text{renewal}} = t_{\text{as-built}} - t_c + 0.5 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

$t_c$ : Corrosion addition specified in **Table 3.5-3**

**Table 3.5-3**



		Corrosion addition $t_c$ (mm)	
Steel Hatch Cover	Type of structure	For top, side and bottom plating	For internal structures
	Single plating type	2.0	
	Double plating type	2.0	1.5
Hatch Coaming		1.5	

- (iii) For all hatch covers and hatch coamings of ships other than bulk carriers that have the application for Classification Survey during Construction submitted to the Society on or after 10 June 2005, the renewal thickness is given by the following formula.

$$t_{\text{renewal}} = t_{\text{as-built}} - t_c + 0.5 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

$t_c$ : Corrosion addition specified in **Table 3.5-4**

Where corrosion addition  $t_c$  is 1.0 (mm), renewal thickness may be given by the formula  $t_{\text{renewal}} = t_{\text{as-built}} - t_c$  (mm)

**Table 3.5-4**

		Corrosion addition $t_c$ (mm)	
Steel Hatch Cover	Type of structure	For top, side and bottom plating	For internal structures
	Single plating type	2.0*	
	Double plating type	1.5*	1.0
Hatch Coaming		1.5	

\* : For steel hatch covers in way of cellular cargo holds: 1.0(mm)

- (iv) Hatch covers and hatch coamings of ships complying with the requirements in 20.2, Part C of the Rules and 19.2, Part CS of the Rules, and ships which are constructed for construction on or after 1 July 2012.

Renewal thickness ( $t_{\text{renewal}}$ ) is given by the following formula. If a voluntary addition is included in the as built thickness, the value may be at the discretion of the Society.

$$t_{\text{renewal}} = t_{\text{as-built}} - t_c + 0.5 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

$t_c$ : Corrosion addition specified in Table 3.5-5

Where corrosion addition  $t_c$  is 1.0 (mm), renewal thickness may be given by the formula

$$t_{\text{renewal}} = t_{\text{as-built}} - t_c \text{ (mm)}$$

**Table 3.5-5**

Type of ship	Type of structural member	Corrosion addition $t_c$ (mm)	
Container carriers and car carriers	Steel hatch cover	1.0	
	Hatch coaming	1.5	
Ships other than those specified above	Single plating type hatch cover	2.0	
	Double plating type hatch cover	Top, side and bottom plating	1.5
		Internal structures	1.0
	Hatch coaming, hatch coaming stay and stiffeners	1.5	

- (c) Vertically corrugated watertight bulkhead abaft the foremost hold complying with the provision of Chapter 31B, Part C (related to IACS UR S19)

For bulk carriers with single side construction, which of 150m ( $L_f^{*3}$ ) in length and above, carrying solid bulk cargoes having bulk density<sup>\*4</sup> of 1.78 t/m<sup>3</sup> or above, which are contracted for construction before 1 July 1998 and are at a beginning stage of construction prior to 1 July 1999, the renewal thickness is given by the following formula. The ships these requirements are applicable to are identified by NOTE in Survey Status.

$$t_{\text{renewal}} = t_{\text{net}} + 0.5 \text{ (mm)}$$

$t_{\text{net}}$ : Required net thickness described in the notification letters on the assessment results or the previous survey record (Form H/BCS(S-19))

\*3 : Length for Freeboard specified in 2.1.3 of Rules Part A

\*4 : Bulk density (t/m<sup>3</sup>) means the ratio of the loaded cargo mass to the volume which is assumed to be occupied by the loaded cargo including empty spaces within the bulk cargo.

(d) Vertically corrugated watertight bulkheads in cargo holds complying with the provision of Chapter 31A, Part C

(i) For bulk carriers, except double side skin construction<sup>\*5</sup>, which of 150m ( $L_f$ ) in length and above, carrying solid bulk cargoes having bulk density of 1.0 t/m<sup>3</sup> or above, which are contracted for construction on and after 1 July 1998, or which are contracted for construction prior to 1 July 1998, but are at a similar stage of construction on and after 1 July 1999, the renewal thickness is given by the following formula.

$$t_{\text{renewal}} = t_{\text{as-built}} - 3.0 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

\*5 : Double side skin construction is to be recognized as single side skin construction if the distance between side shell to the extent between the bottom of top-side tank and the top of bilge hopper tank in cargo holds is either of the followings.

- less than 760mm for bulk carriers at a similar stage of construction prior to 1 January 2000, or
- less than 1,000mm for bulk carriers at a similar stage of construction on or after 1 January 2000

(ii) For ships<sup>\*6</sup> with the class notation (BC-XII), which of 150m ( $L_f$ ) in length and above, being designed to carry solid bulk cargoes having bulk density of 1.0 t/m<sup>3</sup> or above, which are at the beginning stage of construction on or after 1 July 2006, the renewal thickness is given by the following formula.

$$t_{\text{renewal}} = t_{\text{as-built}} - 3.0 \text{ (mm)}$$

$t_{\text{as-built}}$ : as built thickness (mm)

\*6 : Ships of single-side skin construction, or ships of double-side skin construction in which any part of a longitudinal bulkhead is located within B/5 or 11.5m, whichever is less, inboard from the ship's side at right angles to the centreline at the assigned summer load line. B is Breadth of Ship specified in 2.1.4 of Rules Part A.

(iii) For ships subject to above (ii), which have the application for Classification Survey during Construction submitted to the Society on or after 1 July 2007, the renewal thickness is given by the value indicated in the structural drawings.

(e) Hold Frames (related to IACS UR S31)

For bulk carriers having hold frames, which are contracted for construction prior to 1 July 1998, the renewal thickness is given by the following formula. The ships these requirements are applicable to are identified by NOTE in Survey Status.

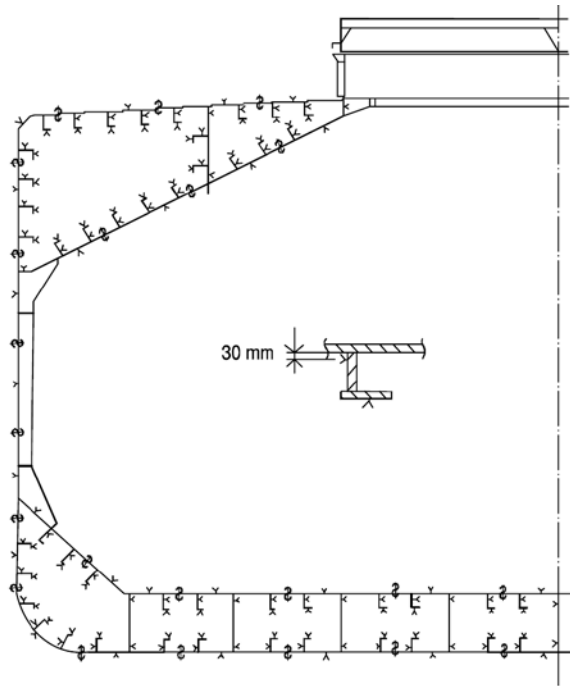
$$t_{\text{renewal}} = t_{\text{ren}} \text{ (mm)}$$

$t_{\text{ren}}$  : Thickness of which renewal is required (mm) described in Preliminary Assessment or the previous thickness measurement record (Form TM7 (S31))

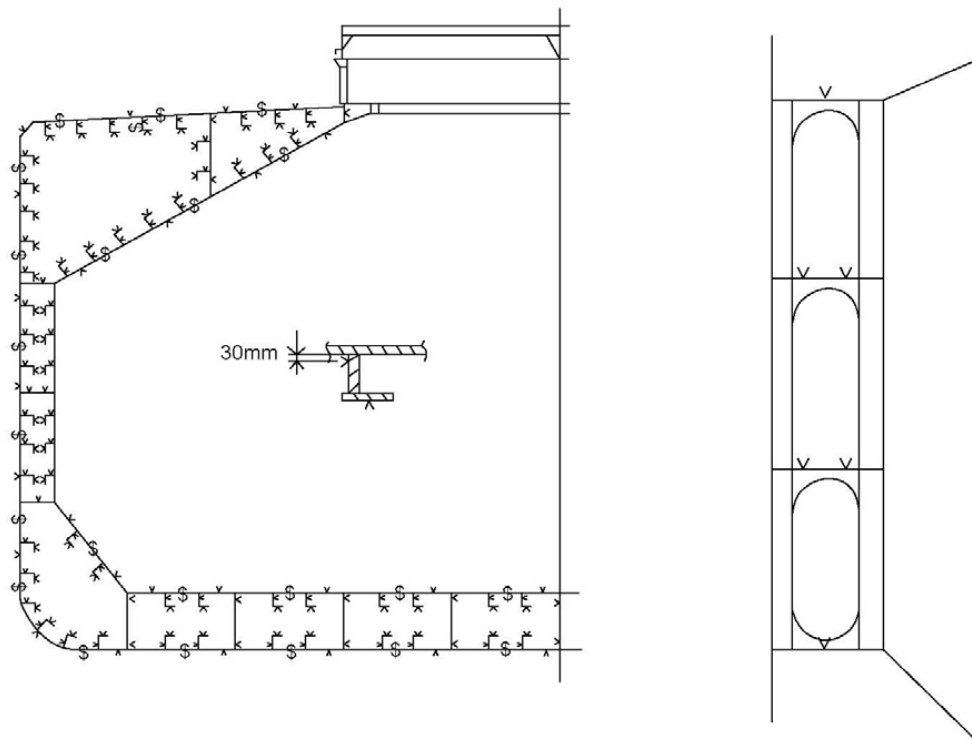
### Appendix 3.6 - Interpretations of rule requirements for the number and location of thickness measurements for CSR bulk carriers

Item	Interpretation	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 as 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 construction: A transverse section includes all longitudinal members (i.e., plating, longitudinals and girders, etc.) at the deck, side, bottom; inner bottom and hopper side plating and bottom plating in top wing tanks. Double side skin construction: A transverse section includes all longitudinal members (i.e., plating, longitudinals and girders, etc.) at the deck, sides, bottom, inner bottom, hopper sides, inner sides and top wing inner sides.	Fig. (A)
All cargo hold hatch covers and coamings	Including plates and stiffeners	Fig. (B)
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 the plate or at representative areas of average corrosion) between the ship sides and hatch coamings in the concerned transverse section	
All deck plating and underdeck structure inside line of hatch openings between cargo hold hatches	«All deck plating» means at least two points on each plate to be taken either at each 1/4 extremity of the plate or at representative areas of average corrosion. “Under deck structure”: at each short longitudinal girder: three points for web plating (fwd/middle/aft), one point for face plate, one point for web plating and one point for face plating of transverse beams in way. At each end of transverse beams, one point for web plating and one point for face plate	Fig. (F)
Selected side shell frames in cargo holds of single side skin construction	Includes side shell frames, upper and lower end attachments and adjacent shell plating. <ul style="list-style-type: none"> <li>• 25% of frames: one out of four frames shall preferably be chosen throughout the cargo hold length on each side.</li> <li>• 50% of frames: one out of two frames shall preferably be chosen throughout the cargo hold length on each side.</li> </ul> «Selected frames» means at least 3 frames on each side of cargo holds	Fig. (C)
Transverse frame in double skin tank of double side skin construction	---	Fig. (A)
Transverse bulkheads in cargo holds	Includes bulkhead plating, stiffeners and girders. Also includes internal structures 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 another position	Fig. (D)
One transverse bulkhead in each cargo hold	This means that close-up surveys 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 surveys on the other side	Fig. (D)
Transverse bulkheads in one topside, hopper, double bottom ballast tank and side ballast tank(double side skin)	Includes bulkhead and stiffening systems. The ballast tank is to be chosen based on the history of ballasting among those prone to have the most severe conditions	Fig. (E)
Transverse webs in ballast tanks	Includes web plating, face plates, stiffeners and associated plating and longitudinals. One of representative tanks of each type (i.e. topside or hopper or side tank) is to be chosen for in the forward part	Fig. (A) Fig. (C)

**Fig. (A) Example of locations subject to thickness measurements in transverse sections**



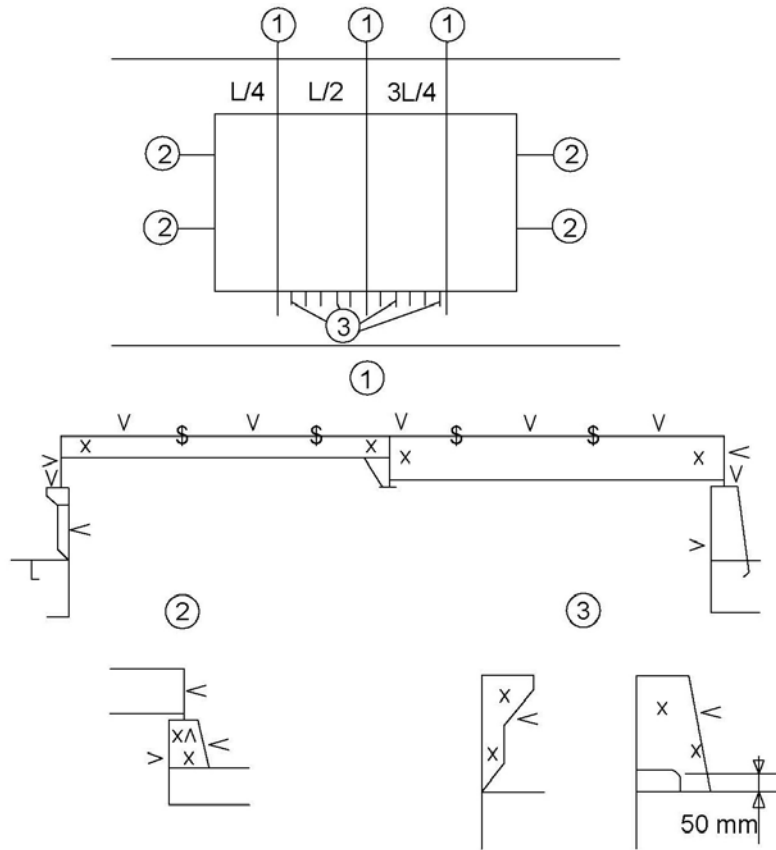
**Single side bulk carriers**



**Double Skin Bulk Carrier**

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

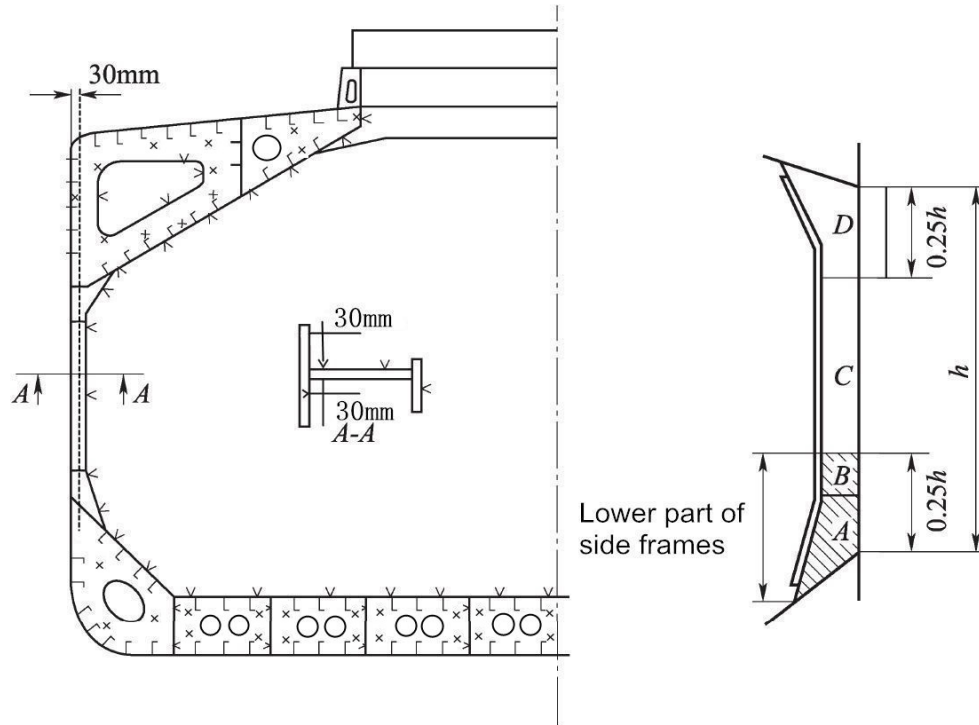
**Fig. (B) Example of locations subject to thickness measurements on hatch covers and hatch coamings**



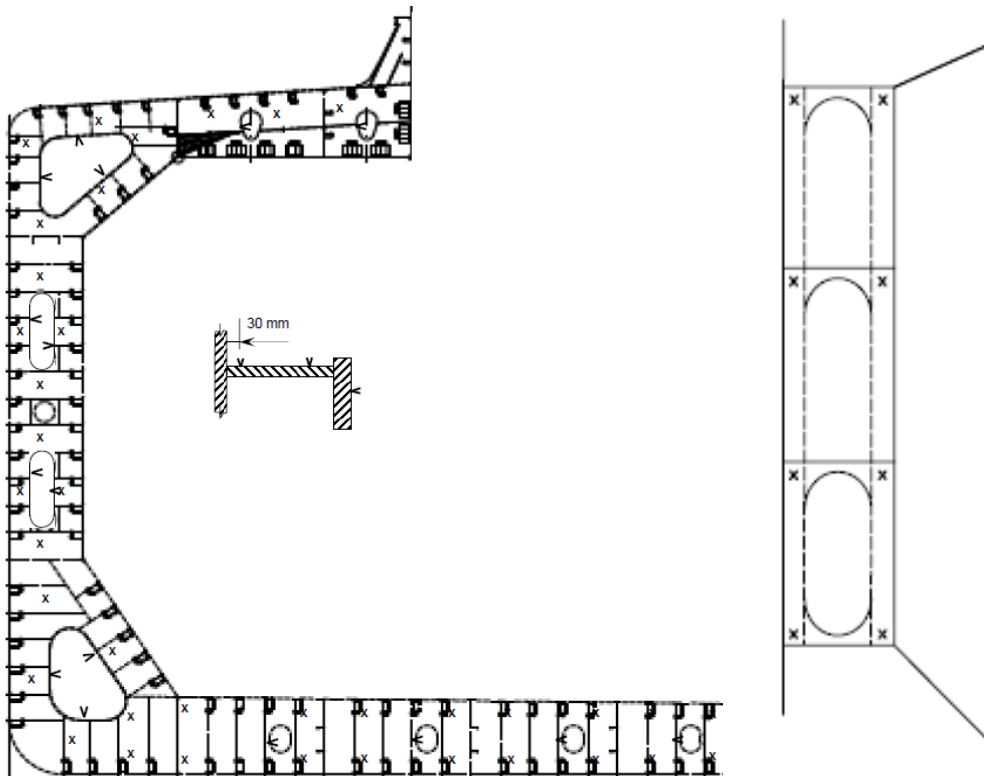
**Notes:**

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 flanges, for each side
2. Measurements of both ends of hatch cover skirt plates, coaming plates and coaming flanges
3. One measurement (two points for web plates and one point for face plates) of one out of three hatch coaming brackets and bars, on both sides and both ends

**Fig. (C) Example of locations subject to thickness measurements in cargo holds and water ballast tanks**



**Single side bulk carriers**

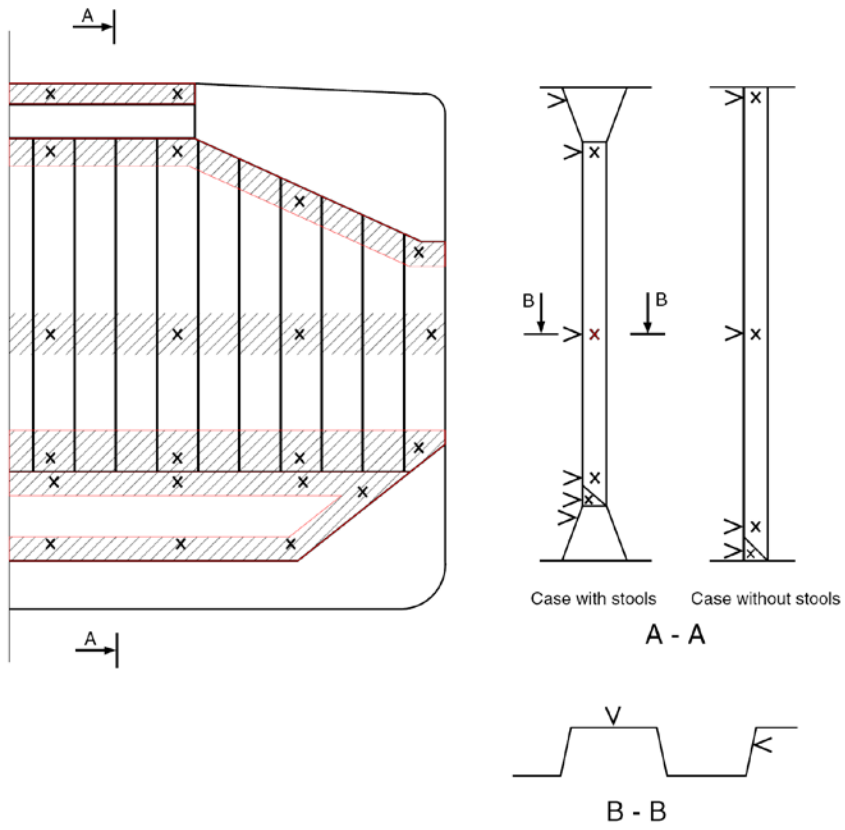


**Double side bulk carriers**

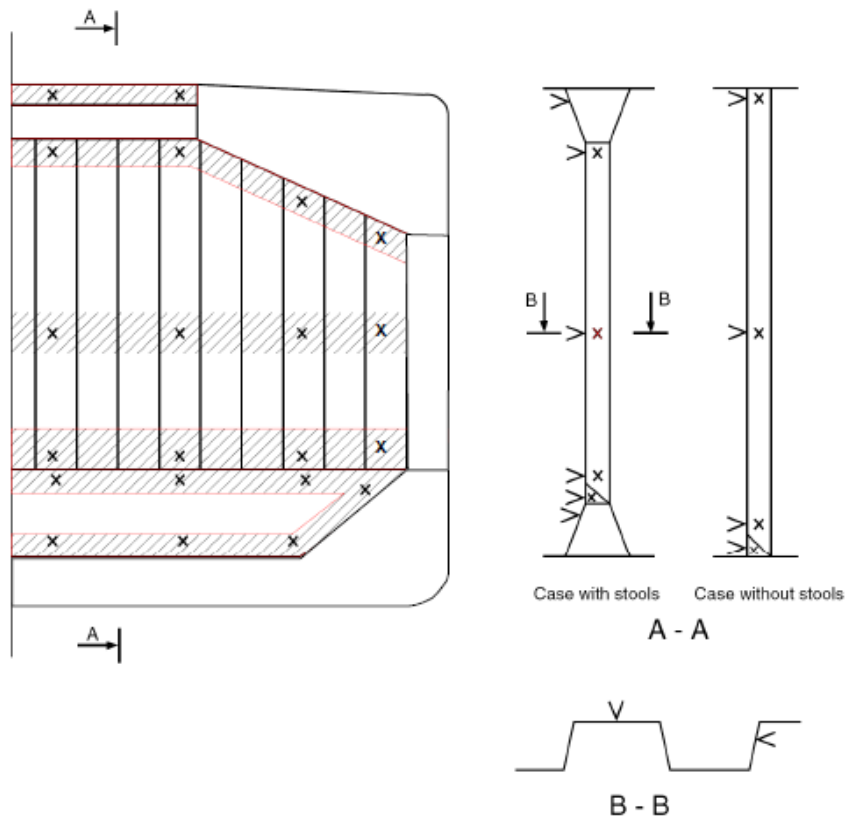
**Note:**

The gauging pattern for web plates 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 plate has general corrosion then this pattern is to be expanded to a five-point pattern.

**Fig. (D) Example of locations subject to thickness measurements on cargo hold transverse bulkheads**



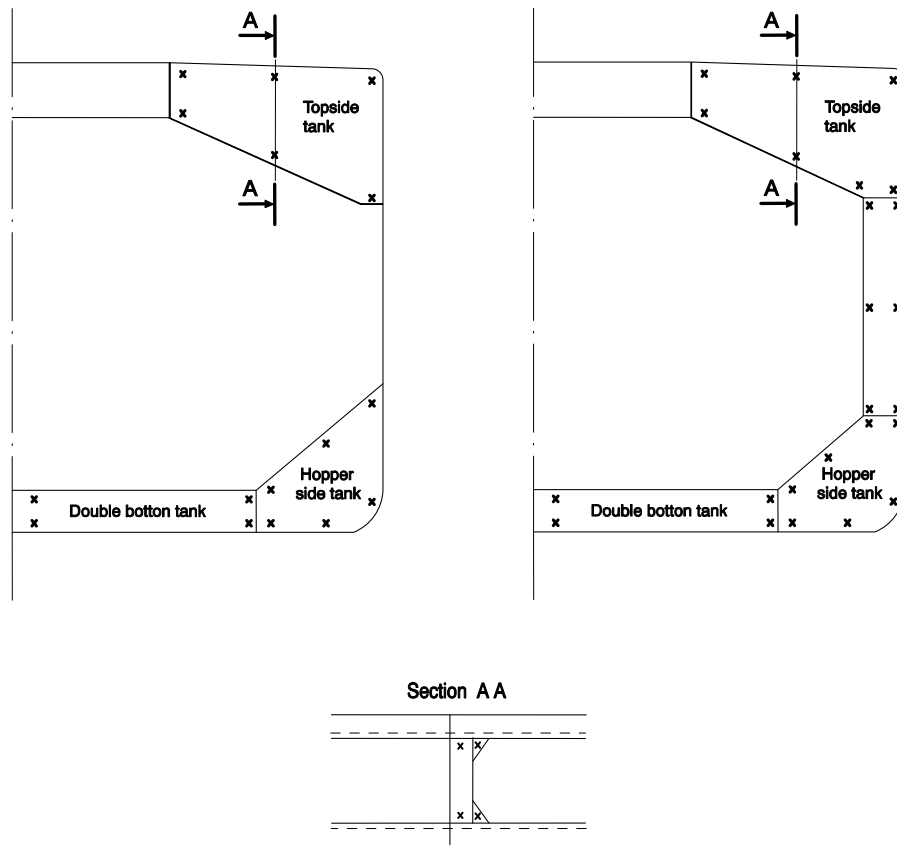
**Single side bulk carriers**



**Double side bulk carriers**

**Note:** Measurements are to be taken in each shaded area as shown in A-A and B-B

**Fig. (E) Example of locations subject to thickness measurements on transverse bulkheads of topside, hopper, double hull and double bottom tanks**



**Note:** Measurements are to be taken in each shaded area as shown in A-A and B-B

**Fig. (F) Example of locations subject to thickness measurements on underdeck structures**

