ClassNK

SURVEY PROGRAMME for Double Hull Tankers

Basic Information and Particulars

Name of Ship	:
IMO Number	:
Flag State	:
Port of Registry	:
Gross Tonnage	:
Deadweight (metric tonnes)	:
Length between perpendiculars (m)	:
Shipbuilder	:
Hull number	:
Recognized Organization (RO)	:
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 owne'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 area, ballast tanks, including fore and aft peak tanks, required by the NK Rules.

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

1.2 Documentation

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

2 Arrangement of Tanks and Spaces

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

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

(*: Delete as appropriate)

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

This section of the survey programme should indicate any changes relating to (and should update) the information on the use of the tanks of the ship, the extent of coatings and the corrosion protective 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)

Tank Arrangement*/Tank List* (*: Delete as appropriate)

4 Conditions for survey

This section of the survey programme should 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 should 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 should 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 should not proceed.

4.4 Tanks and spaces are to be safe for access. Tanks and spaces should be gas free and properly ventilated. Prior to entering a tank, void or enclosed space, it should be verified that the atmosphere in that space is free from hazardous gas and contains sufficient oxygen.

4.5 In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces should be cleaned including removal from surfaces of all loose accumulated corrosion scale. Spaces should be sufficiently clean and free from water, scale, dirt, oil residues etc. to reveal corrosion, deformation, fractures, damages, or other structural deterioration as well as the condition of the coating. However, those areas of structure whose renewal has already been decided by the owner need only be cleaned and descaled to the extent necessary to determine the limits of the areas to be renewed.

4.6 Sufficient illumination should 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) should 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 should be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team should continuously observe the work in the tank or space and should keep lifesaving and evacuation equipment ready for use.

4.8 Where Soft Coatings have been applied, safe access should 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 should 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 should 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 : _____

O2 content measurement and gas detection to be confirmed by : _____

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

Cargo Tank Cleaning Procedures

Indicate the frequency of the tank washing, especially uncoated tanks:

-
-

Washing medium used :

- Crude oil :
- Heated seawater :
- Other medium (specify) :

Inert Gas System installed : Yes / No

- Details of inert gas plant :
- Indicate average oxygen content during inerting :

Reference are made to

- *IACS Recommendation 39 - Guidelines for the use of Boats or Rafts for Close-up surveys; and,*
- *Chapter 10 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT) - Entry into and working in enclosed spaces.*

5 Provisions and method of access to structures

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

Tank No.	Structure	C (Cargo) / B (Ballast)	Temporary staging	Rafts	Ladders	Direct access	Other means (please specify)
F.P.	Fore peak						
A.P.	Aft peak						
Wing Tanks	Under deck						
	Side shell						
	Bottom transverse						
	Longitudinal						
	Transverse						
Centre Tanks	Under deck						
	Bottom transverse						
	Transverse						

5.1 For overall survey, means should 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, should be provided:

.1 Permanent staging and passages through structures;

.2 Temporary staging and passages through structures;

.3 Lifts and moveable platforms;

.4 Boats or rafts;

.5 Portable ladders;

.6 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 should 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 the following conditions should be observed:

.1 Only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, should be used;

.2 The boat or raft should be tethered to the access ladder and an additional person should be stationed down the access ladder with a clear view of the boat or raft;

.3 Appropriate lifejackets should be available for all participants;

.4 The surface of water in the tank should be calm (under all foreseeable conditions the expected rise of water within the tank should not exceed 0.25 m) and the water level either stationary or falling. On no account should the level of the water be rising while the boat or raft is in use;

.5 The tank or space must contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable;

.6 At no time should the water level be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses should only be contemplated if a deck access manhole is fitted and open in the bay being examined, so that an escape route for the survey party is available at all times. Other effective means of escape to the deck may be considered;

.7 If the tanks (or spaces) are connected by a common venting system, or Inert Gas system, the tank in which the boat or raft should be used should be isolated to prevent a transfer of gas from other tanks (or spaces).

5.5 Rafts or boats alone may be allowed for inspection of the under deck areas for tanks or spaces if the depth of the webs is 1.5 m or less.

5.6 If the depth of the webs is more than 1.5 m, rafts or boats alone may be allowed only:

.1 When the coating of the under deck structure is in GOOD condition and there is no evidence of wastage; or

.2 If a permanent means of access is provided in each bay to allow safe entry and exit. This means of access should be direct from the deck via a vertical ladder with a small platform fitted approximately 2 m below the deck. Other effective means of escape to the deck may be considered.

If neither of the above conditions are met, then staging or other equivalent means should be provided for the survey of the under deck areas.

5.7 The use of rafts or boats alone in 5.5 and 5.6 does not preclude the use of boats or rafts to move about within a tank during a survey.

6 List of equipment for survey

This section of the survey programme should 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_2 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 should identify and list the spaces that should undergo a overall survey in accordance with the requirements of the Rules.

See, Appendix 3.1 – Overall Survey Requirements

.1 Cargo Tank

.2 Ballast Tank

.3 Other Tanks/Spaces

7.2 Close-up survey

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

See, Appendix 3.2 – Close-up Survey Requirements

.1 Ballast double hull tanks

Structural members	Tank(s)
One web frame ring	
All web frame rings	
Knuckle area/upper part of one web frame ring	
One deck transverse	
Lower part of one T.BHD	
One T.BHD	
All T.BHDs	

.3 Cargo tanks

Structural members	Tank(s)
One deck transverse	
All web frame rings	
One web frame ring	
Lower part of one T.BHD	
All T.BHDs	

8 Identifications of tanks for tank testing

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

See, Appendix 3.3 – Tank Testing Requirements

Cargo Tanks:	
Ballast Tanks:	
Fuel Oil Tanks:	
Lubrication Oil Tanks:	
Fresh Water Tanks:	

9 Minimum thickness of hull structures

This section of the survey programme should specify the minimum thickness for hull structures of the 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 according to the hull structure plans of the ship;

(b) ☐ Given in the following table(s)

*: The wastage allowance tables should be attached to the survey programme.

See, Appendix 3.5 – The Wastage Allowance

10 Thickness measurement company

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

11 Identification of areas and sections for thickness measurements

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

See, Appendix 3.4 – Thickness Measurement Requirements

Location	TM requirements
Suspect area:	☐ Applicable ☐ Not Applicable
Structural members subject to close-up survey	***See paragraph 7.2***
Each deck plating in one transverse section*	☐ Applicable ☐ Not Applicable
Each deck plate	☐ Applicable ☐ Not Applicable
Each bottom plate	☐ Applicable ☐ Not Applicable
Transverse section:	☐ 1 section, ☐ 2 sections, ☐ 3 sections
Selected wind and water strake outside cargo area	☐ Applicable ☐ Not Applicable
All wind and water strakes within cargo area	☐ Applicable ☐ Not Applicable
All wind and water strakes full length	☐ Applicable ☐ Not Applicable
Internals in FPT & APT	☐ Applicable ☐ Not Applicable
Expose main deck plate outside of cargo area	☐ Applicable ☐ Not Applicable
Representative exposed superstructure deck plate	☐ Applicable ☐ Not Applicable
All keel plates full length	☐ Applicable ☐ Not Applicable
Additional bottom plates	☐ Applicable ☐ Not Applicable
Others:	

*: In way of ballast tank, if any, or a cargo tank used primarily for water ballast within cargo area.

12 Damage experience related to the ship

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

Hull damages sorted by location for this ship

Tank or space number or area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

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

Tank or space number or area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

13 Areas identified with substantial corrosion from previous surveys

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

14 Critical structural areas and suspect areas

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

15 Other relevant comments and information

This section of the survey programme should 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 and ballast tanks (scantling drawings), including information on regarding use of high tensile steel (HTS), to be available. This appendix of the survey programme should 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, should be appended to the survey programme.

Appendix 3 - Other documentation

This part of the survey programme should 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 programmne.

.2 **Close-up Survey Requirements**, as referred to Paragraph 7.2 “Close-up survey” is attached to this survey programmne.

.3 **Tank Testing Requirements**, as referred to Paragraph 8 “Identification of tanks for tank testing” is attached to this survey programmne.

.4 **Thickness Measurement Requirements**, as referred to Paragraph 11 “Identification of areas and sections for thickness measurements” is attached to this survey programmne.

.5 **The Wastage Allowance**, as referred to Paragraph 9 “Minimum thickness of hull structures” is attached to this survey programmne.

Appendix 1 - List of Plans

1. **Basic ship information and particulars;**
   See, attached survey status

2. **Main structural plans of cargo 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 company;**
    See, paragraph 10 of SURVEY PROGRAMME.

12. **Damage experience related to the ship in question; and**
    See, paragraph 12 of SURVEY PROGRAMME.

13. **Critical Structural and Suspect Areas, where relevant.**
    See, paragraph 14 of SURVEY PROGRAMME.

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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, should provide all 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 should 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

Tank No.	Structure	C (Cargo) / B (Ballast)	Temporary staging	Rafts	Ladders	Direct access	Other means (please specify)
F.P.	Fore peak						
A.P.	Aft peak						
Wing Tanks	Under deck						
	Side shell						
	Bottom transverse						
	Longitudinal						
	Transverse						
Centre Tanks	Under deck						
	Bottom transverse						
	Transverse						

Applicable access provisions are to be ticked.

History of cargo with H_2S content or heated cargo for the last 3 years together with indication as to whether cargo was heated and, where available, Marine Safety Data Sheets (MSDS)*

** Refer to resolution MSC.150(77) on Recommendation for material safety data sheets fro MARPOL Annex I cargoes and marine fuel oils.*

Ballast history for the last 3 years

Owner's inspections

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

Table SPQ2

Tank No.	Corrosion protection (1)	Coating extent (2)	Coating condition (3)	Structural deterioration (4)	Tank damage history (5)
Cargo centre tanks					
Cargo wing tanks					
Slop					
Ballast tanks					
Aft peak					
Fore peak					
Miscellaneous spaces					

Note: Indicate tanks which are used for oil/ballast

1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection; 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)
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 should 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 company:

Other information:

Appendix 3.1 – Overall Survey Requirements

Overall survey requirements for Special Survey No.1
1. Cargo holds (see note 1)
2. Cofferdams
3. Ballast tanks (see note 2), and all tanks adjacent to cargo tanks (pimp rooms, cargo compressor rooms, pipe tunnels, cofferdams and void spaces) (see note 3)
4. Cargo tanks (see note 4)
5. Peak tanks
6. Machinery spaces and other spaces

Overall survey requirements for Special Survey No.2 (see note 3)
1. Tanks and spaces subject to examination carried out at Special Survey No.1
2. Fresh water tanks (see note 5)
3. Fuel oil tanks in cargo areas (see note 5)

Overall survey requirements for Special Survey No.3
1. Tanks and spaces subject to examination carried out at Special Survey No.2
2. Fuel oil tanks (see note 6)

Overall survey requirements for Special Survey No.4 and subsequent Special Surveys
1. Tanks and spaces subject to examination carried out at Special Survey No. 3 (see note 7)
2. Lubricating oil tanks (see note 8)

Notes:

1 For holds insulated for the carriage of refrigerated cargo, the limber boards and the 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 POOR coating condition is found, the examination is to be extended as deemed necessary by the Surveyor.

2 Ballast tanks with conditions shown in (a) to (c) require an internal examination to be carried out at annual interval

(a) The protective coating is found in less than GOOD condition and is not repaired to the satisfaction of the Surveyor

(b) The protective coating has not been applied from the time of construction or soft coating has been applied (The examination is to be extended to other ballast tanks of the same type).

(c) Substantial corrosion is found within the tanks

3 An internal examination of the pump room is to be carried out carefully paying attention to the sealing arrangements of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of

4 Combined cargo/ballast tanks, if any, are to be examined carefully taking account of ballast history and the extent of the corrosion prevention system provided.

Condition of the inner surface of the bottom plating of the tank is to be examined carefully in order to ascertain that there is no excessive pitting of the plating.

Bell months of the cargo suction poles are to be removed and the bottom plating of the tank and bulkheads in that vicinity are to be examined as considered necessary by the Surveyor.

5 If fresh water tanks and fuel oil 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 to just one selected tank respectively.

Notwithstanding the above, peak tanks are to be subject to internal examinations at each Special Survey.

6 For fuel oil tanks:

(1) If fuel oil tanks in cargo areas for tankers or in cargo length areas for other ships have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just two selected tanks. In cases where deep fuel oil tanks are provided, one or more deep tanks are to be included in this scope.

(2) If fuel oil tanks other than those mentioned in (1) have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one tank selected from those in engine rooms. Notwithstanding the above, peak tanks are to be subject to internal examinations at each Special Survey.

7 For fuel oil tanks:

(1) If fuel oil tanks in cargo areas for tankers or in cargo length areas for other ships have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to half of the selected tanks, but not less than two tanks. In cases where deep fuel oil tanks are provided, one or more deep tanks are to be included in this scope.

(2) If fuel oil tanks other than those mentioned in (1) have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one tank selected from those in engine rooms. Notwithstanding the above, peak tanks are to be subject to internal examinations at each Special Survey.

8 If lubricating oil 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 to just one selected tank. Notwithstanding the above, peak tanks are to be subject to internal examinations at each Special Survey.

Appendix 3.2 – Close up Survey Requirements

Close-up survey requirements for Special Survey No.1
1. One web frame - in a ballast double hull tank (see note 1)
2. One deck transverse - in a cargo tank or on deck (see note 2)
3. One transverse bulkhead - in a ballast double hull tank (see note 3)
4. The lower part of each one transverse bulkhead - in a cargo wing tank (see note 3)
5. The lower part of each one transverse bulkhead - in a cargo center tank (see note 3)

Close-up survey requirements for Special Survey No.2
1. All web frames - in a ballast double hull tank (see note 1)
2. The knuckle area and the top part of one web frame – in each remaining ballast tank (see note 4)
3. One deck transverse - in or on two cargo center tanks (see note 2)
4. One transverse bulkhead - in all ballast double hull tanks (see note 3)
5. The lower part of each one transverse bulkhead - in a cargo wing tank (see note 3 & 5)
6. The lower part of each one transverse bulkhead - in two cargo center tanks (see note 3)

Close-up survey requirements for Special Survey No.3
1. All web frames - in all ballast tanks (see note 1)
2. All web frames - in a cargo tank (or a cargo tank for oil tankers) (see note 1)
3. One web frame - in each remaining cargo tank (see note 1)
4. All transverse bulkheads - in all cargo and ballast tanks (see note 3)

Close-up survey requirements for Special Survey No.4 and subsequent Special Surveys
1. As Special Survey No.3
2. Additional transverses included as deemed necessary by the surveyor

Notes: Abbreviations in above tables mean:

1 Cross ties and complete trans. web frame ring including adjacent structural members such as shell plating longitudinal bulkhead, longitudinal stiffeners, and brackets.

2 Deck transverse In tank or on deck including deck structural members adjacent to deck transverse such as deck plating, longitudinal stiffeners and internal structure of lower and upper stools, where fitted.

3 Transverse bulkhead including vertical and horizontal girders and structural members adjacent to transverse bulkheads such as longitudinal bulkheads, inner bottom plating, hopper plating, bottom girders, brackets, and stiffeners; and internal structure of lower and upper stools, where fitted.

4 The knuckle area includes the slope hopper plating and where is connects to the inner hull bulkhead and inner bottom plating; up to 2 meters from the corners along the bulkhead and double bottom; and adjacent structural members

5 Where no center cargo tanks are fitted (as in the case of center longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.

6 Additional complete transvers web frame ring including adjacent structural members listed in 1.

Appendix 3.3 – Tank Testing Requirements

Tank testing requirements for Special Survey for ships up to 5 years of age (Special Survey No.1)	
1.	Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, fuel oil tanks, pump rooms and cofferdams.
2.	All water tanks. Pressure tests of fresh water tanks may be specially considered when deemed appropriate by the Society.
3.	All fuel oil tanks. Pressure tests may be specially considered when deemed appropriate by the Society.
4.	All lubrication oil tanks. Pressure tests may be specially considered when deemed appropriate by the Society.

Tank testing requirements for Special Survey for ships over 5 years and up to 10 years of age (Special Survey No.2)	
1.	All cargo tank bulkheads.
2.	For water tanks, fuel oil tanks and lubrication oil tanks, as Special Survey No.1.

Tank testing requirements for Special Survey for ships over 10 years of age (Special Survey No.3 and subsequent Special Surveys)	
1.	All cargo tank bulkheads.
2.	For water tanks, fuel oil tanks and lubrication oil tanks, as Special Survey No.1.
3.	For ships carrying dangerous chemicals in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks.

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

TM Requirements for Special Survey No.1
1. Suspect areas
2. Each deck plating in one transverse section in way of ballast tank, if any, or a cargo tank used primarily for water ballast within the cargo area
3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
4. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other pipings in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examination.

TM Requirements for Special Survey No.2
1. Suspect areas
2. Within the cargo area: .1 Each deck plate .2 One transverse section. 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. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
4. Selected wind and water strakes outside cargo area
5. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other pipings in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examination.

TM Requirements for Special Survey No.3
1. Suspect areas
2. Within the cargo area: .1 Each deck plate .2 Two transverse sections. 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. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
4. Selected wind and water strakes outside cargo area
5. All wind and water strakes within cargo area
6. Internals in fore peak tank and aft peak tank
7. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other pipings in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examination.

TM Requirements for Special Survey No.4 and subsequent Special Surveys
1. Suspect areas
2. Within the cargo area: .1 Each deck plate .2 Three transverse sections. 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. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
4. All wind and water strakes
5. Internals in fore peak tank and aft peak tank
6. All exposed main deck plates outside the cargo area
7. Representative exposed superstructure deck plating (poop, bridge and forecastle deck)
8. All keel plates full length. and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks
9. Plating of sea chests, Shell plating in way of overboard discharges as deemed necessary by the Surveyor.
10. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other pipings in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examination.

Notes:

1 The surveyor may extend the thickness measurements as deemed necessary.

2 Where substantial corrosion is found, the extent of thickness measurements should be increased accordingly.

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.

(ii) The wastage allowance for longitudinal strength members given in the following table 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, 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.

Structural Member	Wastage Allowance
- Shell plates - Strength deck plates - Longitudinal beams (flat bar) on shear strake and strength deck - Tight bulkheads in deep tanks***** - Inner bottom plates	20% of original thickness + 1 mm
- Floors and girders in double bottom - Primary members (web & face) - Web, face and bracket of hold frames - Watertight bulkhead plates	25% of original thickness
- Web and face of frames (excluding hold frames), longls beams, stiffeners and brackets - Effective deck plates - Hatch cover and hatch beam	30% of original thickness

***** 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 should 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.**

(i) Corrosion exceeding acceptable limit

The Surveyor should 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 should be given. S*ubstantial corrosion* in excess of 75% of allowable margin 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[except cargo tanks], Intermediate and Special Survey).

Appendix 3.6 - Interpretations of rule requirements for the number and location of thickness

Item	Interpretation	Reference
Selected plates	**«Selected» means at least a single point on one out of three plates, to be chosen as representative areas of average corrosion.**	
Deck, 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	**Measurements to be taken on all longitudinal members (i.e., plating, longitudinals and girders, etc.) at the deck, side, bottom, longitudinal bulkheads, inner bottom and hopper. One point to be taken on each plate. Both web and flange to be measured on longitudinals, if applicable.** **For tankers older than 10 years of age:** • **Within 0.1*D* (where *D* is the ship's moulded depth) of the deck and bottom at each transverse section to be measured,** • **Every longitudinal and girder is to be measured on webs and face plates** • **Every plate is to be measured at one point between longitudinals.**	**Fig. (A)**
Transverse rings (1) in cargo and ballast tanks	• **At least two points on each plate in a staggered pattern and two points on the corresponding flange, where applicable.** • **Minimum 4 points on the first plate below deck. Additional points in way of curved parts.** • **At least one point on each of two stiffeners between stringers / longitudinal girders.**	**Fig. (B)**
Transverse bulkheads in cargo tanks	• **At least two points on each plate. Minimum 4 points on the first plate below main deck.** • **At least one point on every third stiffener to be taken between each stringer.** • **At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved parts.** • **Two points of each diaphragm plate of stools (if fitted).**	**Fig. (C)**
Transverse bulkheads in ballast tanks	• **At least 4 points on plates between stringers / longitudinal girders, or per plate if stringers / girders are not fitted.** • **At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved parts.** • **At least one point on two stiffeners between each stringer / longitudinal girder.**	**Fig. (D)**
Adjacent structural members	• **On adjacent structural members, one point per plate and one point on every third stiffener / longitudinal.**	

(1) "Transverse rings" means all transverse material appearing in a cross-section of the ship's hull in way of a double bottom floor, vertical web and deck transverse

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

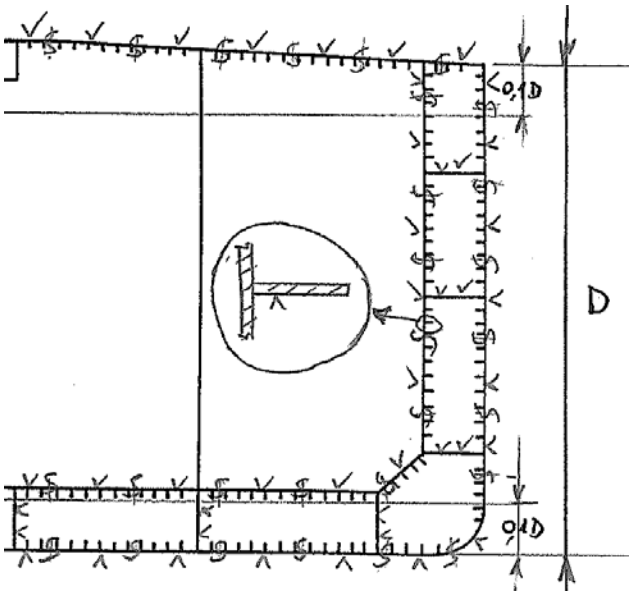

Fig. (B) Example of locations subject to thickness measurements on transverse rings in cargo and ballast tanks (double hull oil tankers)

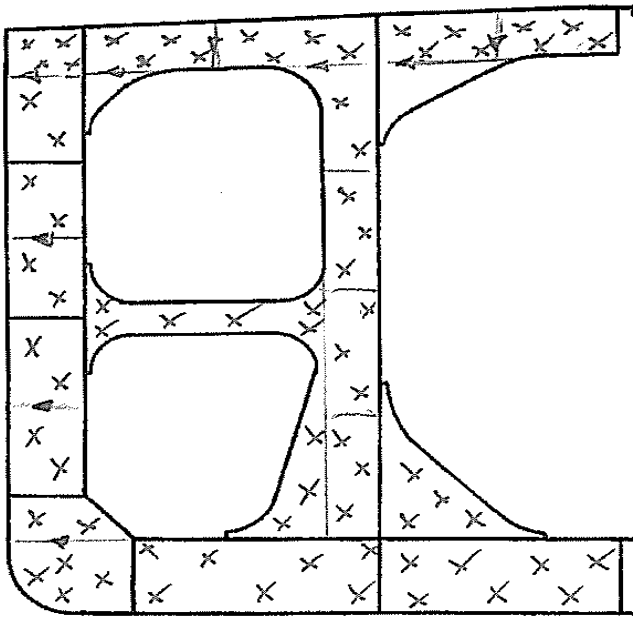

Fig. (C) Example of locations subject to thickness measurements on transverse bulkheads in cargo tanks (double hull oil tankers)

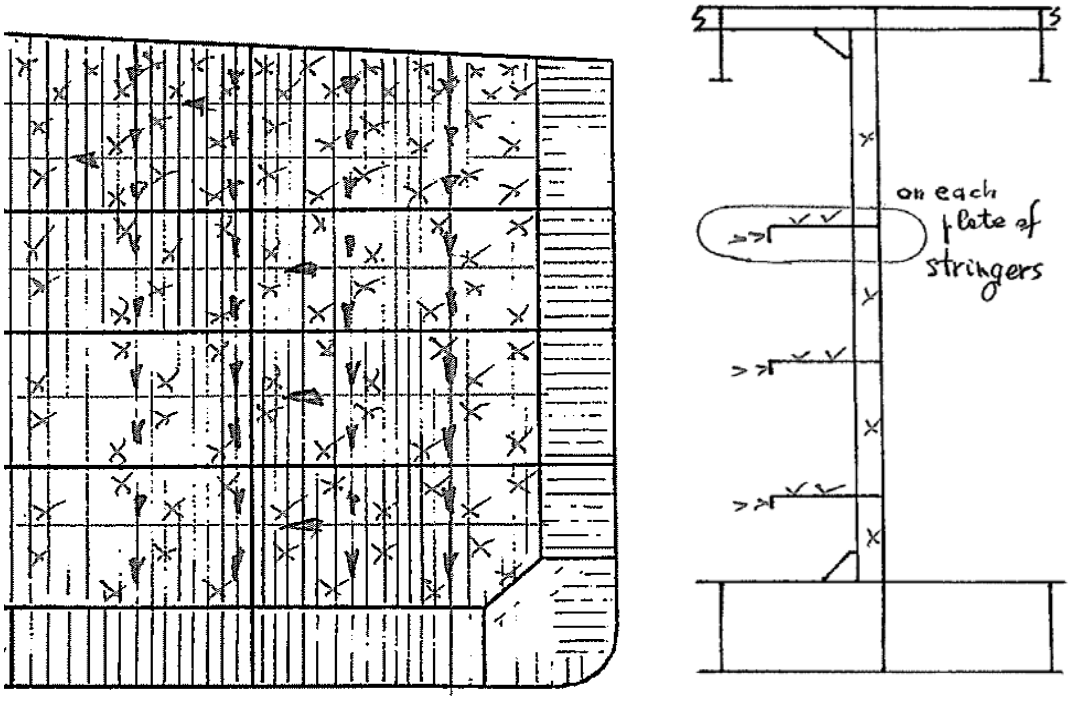

Fig. (D) Example of locations subject to thickness measurements on transverse bulkhead in ballast tanks (double hull oil tankers)