# 2025

Rules for the Classification of Steel Ships

# Part 1 Classification and Surveys

Rules

# 2025

Guidance Relating to the Rules for the Classification of Steel Ships

# Part 1 Classification and Surveys

Guidance

# 2025

## Rules for the Classification of Steel Ships

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# Part 1

# Classification and Surveys

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RA-01-E

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# APPLICATION OF PART 1 "CLASSIFICATION AND SURVEYS"

1. Unless expressly specified otherwise, the requirements in the Rules apply to ships for which the application for Classification Survey is submitted to the Society on or after 1 July 2025.
2. The amendments to the Rules for 2024 edition and their effective date are as follows;

**Effective Date 1 November 2023**

CHAPTER 1 CLASSIFICATION

Section 9 Suspension/Withdrawl of Class and Reclassification

- 901. 6. (4) has been amended.

**Effective Date 1 July 2024 (to ships contracted for construction)**

CHAPTER 1 CLASSIFICATION

Section 3 Classification Survey during Construction

- 306. 2 has been newly added.

CHAPTER 2 PERIODICAL AND OTHER SURVEYS

Section 2 Annual Survey

- 202. 1. (38) has been newly added.

**Effective Date 1 August 2024**

CHAPTER 2 PERIODICAL AND OTHER SURVEYS

Section 6 Docking Survey

- 605. 1. (4) has been amended.

Section 16 Hull Surveys for Liquefied Gas Carriers

- 1604. 1. (7) has been amended.

**Effective Date 1 January 2025 (to ships contracted for construction)**

CHAPTER 1 CLASSIFICATION

Section 3 Classification Survey during Construction

- 307. 2 has been amended.
- 309. has been amended.
- 310. has been amended.

**Effective Date 1 January 2025**

## CHAPTER 1 CLASSIFICATION

### Section 1 General

- 101. 8 & 9 have been amended.
- 101. 10 thru. 13 have been newly added.

### Section 6 Appication for Survey

- 601. has been amended.

## CHAPTER 2 PERIODICAL AND OTHER SURVEYS

### Section 6 Docking Survey

- 603.4 has been amended.

**Effective Date 1 July 2025**

## CHAPTER 2 PERIODICAL AND OTHER SURVEYS

### Section 2 Annual Survey

- 202. 1. (30) had been amended.
- 202. 1. (31) has been newly added.

### Section 4 Special Survey (Hull, Equipment and Fire-extingshing Appliances)

- 403. 1. (16) & (17) have been amended.
- 403. 1. (18) has been newly added.

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# CHAPTER 1 CLASSIFICATION

## Section 1 General

### 101. Definitions *(2020)*

The definitions of terms used in **Ch 1, Ch 2** and **Ch 3** are to be as specified in the following, unless otherwise specified elsewhere.

1. **Classification** means recording the name and relevant data of a ship which has been satisfactorily surveyed in accordance with this Society's Rules and approved by the Classification Committee, on the computer register.

2. **Register of Ships** means a documentation containing the name, principal particulars, etc., of all KR registered ships.

3. **Classification Technical Rules** include Rules and Guidance. *(2021)*

   (1) **Rules** means the Rules which have been established/amended by this Society to undertake classification and survey on ships, offshore units and relevant equipment.

   (2) **Guidance** means the Guidance relating to the Rules and other Guidance.

4. **Class Notation** means a notation in which the characteristics of a ship is expressed in letters or symbols, indicating that it meets the compulsory application requirements of the ship and/or additional voluntary standards requirements. Class notation consists of construction symbols, service restriction notation of hull/machinery, equipment, ship type notation, special feature notations, additional special feature feature notations and additional installation notations. *(2022)*

5. **Date of contract for construction** *(2022)*

   (1) The date of contract for construction of a vessel is the date on which the contract to build the vessel is signed between the prospective Owner and the shipbuilder. This date and the construction numbers(i.e. hull numbers) of all the vessels included in the contract are to be declared to the Society by the party applying for the assignment of class to a newbuilding.

   (2) The date of contract for construction of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective Owner and the shipbuilder.

   (3) In application to **Par 2**, vessels built under a single contract for construction are considered a series of vessels if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided;

   (A) Such alterations do not affect matters related to classification, or
   (B) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

   The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

   (4) If a contract for construction is later amended to include additional vessels or additional options, the date of contract for construction for such vessels is the date on which the amendment to the contract, is signed between the prospective Owner and the shipbuilder. The amendment to the contract is to be considered as a new contract to which **Par 1** to **Par 3** above apply.

   (5) If a contract for construction is amended to change the ship type, the date of contract for construction of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

6. **Sister-ship** means a ship intended to be built by the same builder, based on the plans and documents approved for other ships and regarded as the same or similar by the Society. *(2022)*

7. **Classification Survey during Construction** menas the survey which is carried out on new building ship that is built in accordance with the Classification Technical Rules from the initial stage of construction with the purpose of registering to this Society.

8. **Double Class Vessel** means a vessel which is classed by two Societies and where each Society works as if it is the only Society classing the vessel and performs all surveys in accordance with its own Rules, requirements and schedule. *(2025)*

9. **Dual Class Vessel** means a vessel which is classed by two Societies. These Societies have a written bilateral agreement that outlines sharing of work, including a working plan, and procedures and, in case of newbuilding, a written trilateral agreement with the shipyard. *(2025)*

10. **Bilateral Agreement** means an agreement adopted by the two Societies with Dual Class Vessels. *(2025)*

11. **Trilateral Agreement** means an agreement adopted by the shipyard and the two Societies involved in dual class arrangement (first Society and second Society) for describing the responsibilities between the two Societies during new construction of a vessel. *(2025)*

12. **First Society** means a Society classing a vessel which, under request of the Owner, enters a double or dual class arrangement with another Society.

13. **Second Society** means a Society which is requested by an Owner to accept a vessel already classed, or to be classed, by another Society into its class under double or dual class arrangement.

14. **The Owner** means including Charterer, representatives of Owner, Representatives of Charterer and master of ship.

15. **Periodical Survey** means Special Survey, Intermediate Survey and Annual Survey.

16. **Verification** menas a service that confirms through the provision of objective evidence(analysis, observation, measurement, test, or records or other evidence) that specified requirements have been met.

17. **Condition(s) of Class** mean(s) requirements to the effect that specific measures, repairs, surveys etc is(are) to be carried out within a specific time limit in order to retain Classification.

18. **Alternative design** means a design that deviate from the Rules of the Society.

19. **Novel feature** means a technology that has no previous experience in the environment being proposed and based on novel design principles or features to which the Classification Rules are not directly applicable.

20. **Force majeure** means damage to the ship; unforeseen inability of the Society to attend the vessel due to the governmental restrictions on right of access or movement of personnel; unforeseeable delays in port or inability to discharge cargo due to unusually lengthy periods of severe weather, strikes or civil strife; acts of war; or other force majeure(such as Pandemic). *(2021)*

21. **Water/oil-tight** means capable of preventing the passage of water through the structure in either direction with a proper margin of resistance under the pressure due to the maximum head of water which it might have to sustain. *(2022)*

22. **Weathertight** means that in any sea conditions water will not penetrate into the ship. *(2022)*

23. **Air/gas-tight** means that air or gas between adjacent areas (or boundaries) does not pass through. *(2022)*

24. **Structural Testing or Tank Testing** means a hydrostatic test carried out to demonstrate the structural adequacy of design and tightness of tank boundaries. *(2022)*

25. **Cargo spaces** mean spaces used for cargo, cargo oil tanks tanks for other liquid cargo and trunks to such spaces. *(2022)*

26. **Sea casualty** means any accidents of collision, grounding, explosion, fire, breakdown of machinery and equipment, and marine pollution on KR classed ships. *(2022)*

27. **Cofferdam** means an empty space arranged so that compartments on each side have no common

boundary. *(2024)*

28. **Void space** or **Void** means an enclosed empty space in a ship. *(2021)*

29. **Tank** is the generic term for spaces intended to carry liquid, such as, seawater, fresh water, oil, liquid cargoes, FO(Fuel Oil), DO(Diesel Oil), etc. *(2023)*

## 102. Classification and Continuation of the Classification *(2021)*

1. Steel ships built and surveyed in accordance with the Rules of the Society(hereafter referred to as "the Rules") or with the alternatives equivalent to the Rules will be assigned a class designation by the Society and registered in the Register of Ships.

2. Tests and Inspections specified in the Rules of the Society are to be carried out under attendance of the Surveyor, unless expressly specified otherwise. *(2021)*

3. All ships classed with the Society are, for continuation of the classification, to be subjected to the periodical and other surveys, and are to be maintained in good condition in accordance with the requirements of the Rules.

4. When a ship classed with the Society makes an alteration or modification of such an extent as to influence to the ship's original performances, the plans have to be submitted for the Society's approval before the work is commenced and the alteration work has to be supervised by the Surveyor.

## 103. Standard application of the Rules

1. The Rules are framed on the understanding that ships will be properly loaded and handled and not, unless stated in the class notation, provide special distributions and concentrations of loading.

2. The plans of ships designed for specific condition of loading or particular features in respect of the hull, machinery or equipment are also to be submitted for approval.

## 104. Exclusion from the Rules

The Society cannot assume responsibility for trim, hull vibration or other technical characteristics not covered by the Rules. However, the Society may advise on such matters upon application by an Owner.

## 105. Equivalence *(2023)*

The Society may consider the acceptance of alternatives and novel features which deviate from or are not directly applicable to the Rules, provided that they are “deemed to be equivalent to the Rules to the satisfaction to the Society”.

Note : "deemed to be equivalent to the Rules to the satisfaction to the Society" includes the following cases.

(1) Where as recognized international standards(ISO, IEC, etc.) or national standards(KS, JIS, ASME, etc.) recognized by the Society, each cited in the Classification Technical Rules

(2) Where approved in accordance with **Guidance for Approval of Risk-based Ship Design**.

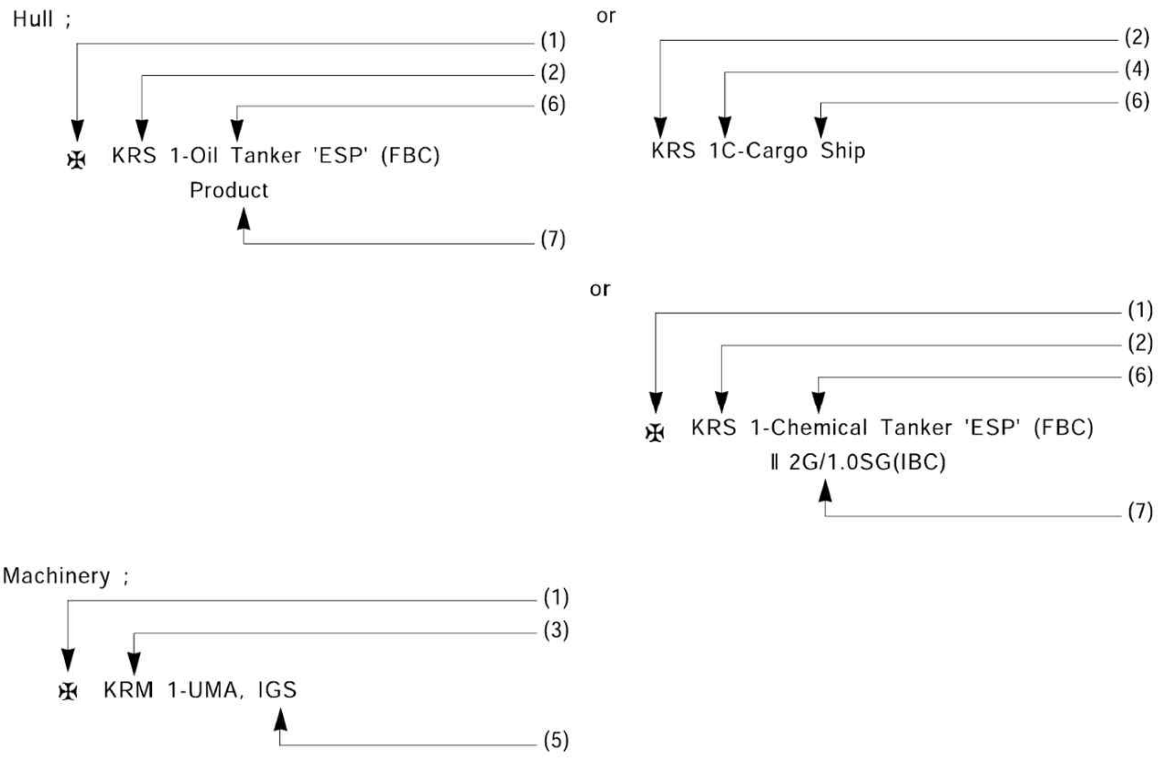
(3) Where having proven service experience deemed appropriate by the Society. For the purposes of this paragraph, proven in-service experience means having a service record of maintaining the performance without any damage for sufficient period.

# Section 2 Class Notations

## 201. Class notations 【See Guidance】

The class notations assigned to the ships classed with the Society are to be in accordance with the followings:

1. Upon the request of the applicant(i.e., the Owner or the Builder), character of class including class notations shall be assigned to ships which have been built to comply with the corresponding requirements of the Rules. In addition to **201.** (7) and (8), the Special Feature Notation such as designated cargo or purpose, etc. may be appended at the request of the Owner when considered appropriate by the Society. *(2020)*
2. The Society may change or update the class notations at any time in consultation with the applicant, provided that the Class Notations already recognized are not suitable for the intended service(type, use and etc.), navigation and any other required rules. *(2020)*




(1) **Construction symbols**

The construction symbols assigned to the ships according to the distinction of Classification Survey are to be in accordance with the followings:

✠ ; For ships built under the supervision of the Society.
No symbol ; For ships considered to be fit as the result of surveys by the Surveyor after construction with the exception of the above mentioned construction symbols.

(2) **Service restriction notations of hull**

The following service restriction notations will be given for ships with hull construction and strength found to be in compliance with the Rules:

KRS 1 ; For ships unrestricted in service area.
KRS 0 ; For ships restricted in service area.

(3) **Service restriction notations of machinery**(apply to ships having main propulsion machinery) *(2021)*
The following service restriction notations will be given for ships with machinery and electrical installations found to be in compliance with the Rules:

KRM 1 ; For ships unrestricted in service area.
KRM 0 ; For ships restricted in service area.

(4) **Service restriction notations of equipment**
The following service restriction notations will be given for ships with equipment found to be in compliance with the Rules:

No symbol ; For ships unrestricted in service area.
C ; For ships approved with the condition of coastal service.
S ; For ships approved with the condition of smooth water service.

(5) **Additional installations notations**
(A) Ships designed for the application of additional installations on hull items will be distinguished after the character of hull by the class notation such as "LI", "CHA", "HMS" or "HMS1", etc. and on machinery items will be distinguished after the character of machinery by the class notation such as "CMA", "UMA", "DPS", "NBS", "IGS", "COW", "STCM" or "RMC", etc. *(2018)*

(B) Such notations shall, when there is an application by the Builder or the Owner, be assigned after confirming that the requirements are met. However, installations affecting the safety of lives and ships are to be satisfied with the relevant requirements and be assigned with the appropriate notations. *(2021)*

(6) **Ship type notations**
Ships designed in compliance with particular Rules intended to apply to that type of ship will be indicated by the appropriate designations such as Oil Tanker 'ESP'(FBC), Bulk Carrier 'ESP', Cargo Ship, Passenger Ship, Tug Boat, Barge, etc. affixed to the character of hull.

(7) **Special feature notations** *(2020)*
The Special Feature Notations may be located under the character of the ship type notations. These special feature notations could consist of the hull structure and the cargo tank type fitted for the kind and nature of cargoes, ice strengthening, in-water survey, cargo loading condition, design temperature, design pressure, the apparent specific gravity of cargoes, Also, the restriction of navigation area and condition may be remarked additionally.

(8) **Additional Special feature notations** *(2020)*
When considered necessary by the Society, the Additional Special Feature Notations may be located side by appended to the character of Special Feature Notations. These special feature notations could consist of the direct strength assessment, direct fatigue assessment, hull construction monitoring, and/or longitudinal strength of hull girder in flooded condition for bulk carriers, etc.

(9) The details for ship type, special feature notations and additional installations notations of class notations are given in **Annex 1-1** of the Guidance. *(2021)*

## 202. Class notations of large yachts

The class notations of large yachts classed with the Society are to be in accordance with the requirements specified in **Pt 1, Ch 1, 103.** of the **Guidance for Large Yachts** irrespective of the requirements in **201.**

## 203. Class notations of recreational crafts

The class notations of recreational crafts classed with the Society are to be in accordance with the requirements specified in **Ch 1, 103.** of the **Guidance for Recreational Crafts** irrespective of the requirements in **201.**

# Section 3 Classification Survey during Construction *(2022)*

## 301. Classification Survey during Construction 【See Guidance】

For a ship requiring Classification Survey during Construction, the construction, materials, scantlings and workmanship of the hull, equipment and machinery are to be examined in detail in order to ascertain that they meet the appropriate requirements of the Rules.

Furthermore, the hull survey for Classification Survey during Construction for ships subject to **Annex 1-12** is to be in accordance with **Annex 1-12.** *(2021)*

## 302. Approval of plans 【See Guidance】

For a ship requiring Classification Survey during Construction, the plans and documents showing the details of the construction, materials, scantlings and particulars of the hull, equipment and machinery are to be submitted in triplicate and approved before the work is commenced. The same applies also to the cases of any subsequent modifications to the approved drawings or documents.

## 303. Materials and equipment

All materials used for a ship requiring Classification Survey during Construction are to be manufactured under approved method or under alternative process considered equivalent to the approved method and are to be adequate to the relevant requirements of the Rules. The Society may request the relevant documents such as certificate of materials or equipment, etc. for the confirmation of the materials or equipment which are used.

## 304. Machinery installation 【See Guidance】

Main engines, shafting arrangement, boilers, pressure vessels, electrical equipment, essential auxiliary machinery, and piping arrangements to be installed on a ship intended for classification are to be surveyed during construction. Shop trials are to be carried out on completion under a same condition as installed on-board ship or a similar condition as far as practicable. Various tests on any special part amongst the automatic or remote control systems and measuring devices considered necessary by the Society may be requested at the manufacturing sites.

## 305. Workmanship

For Classification Survey of a ship, the materials, workmanship and arrangements are to be surveyed under the supervision of the Surveyor from the commencement of the work until the completion of the ship. When the machinery is constructed under Classification Survey, this survey is to be related to the period from the commencement of the work until the final test under working conditions. Any item found not to be in accordance with the Rules or the approved plans, or any material, workmanship or arrangement found to be unsatisfactory are to be rectified.

## 306. Tests 【See Guidance】

In the Classification Survey during Construction, hydrostatic, watertight and performance tests are to be carried out in accordance with the relevant part of the Rules. Also the control systems and measuring device after installation are to receive the necessary tests, as deemed necessary by the Society. In addition, the survey of watertight cable penetrations(bulkheads and decks) and watertight pipe penetrations(bulkheads or decks) are to be in accordance with the following. *(2024)*

### 1. Surveys of Watertight Cable Transits *(2021)*

(1) Watertight cable transits are to be installed and maintained in accordance with the manufacturer's requirements and in accordance with the requirements of the relevant Type Approval certification.

(2) Cable Transit Seal Systems Register
(A) A Cable Transit Seal Systems Register (Register) is to be provided by the shipbuilder for all watertight cable transits fitted to the vessel. For an example of a register see Appendix 1-12-5 "Recommendatory Sample - Cable Transit Seal Systems Register". The Register can

be in either a hard copy or digitized media.
It is to include a marking / identification system, documentation referencing manufacturer manual(s) for each type of cable transit installed, the Type Approval certification for each type of transit system, applicable installation drawings, and a recording of each installed transit documenting the as built condition after final inspection in the shipyard. It is to include sections to record any inspection, modification, repair and maintenance.

(B) The Register shall be reviewed by the attending Surveyor to confirm it contains a list of the watertight cable transits, applicable cable transit information and sections to maintain in-service maintenance and survey records.

(C) For manned vessels the Register is to be held onboard of the vessel. For unmanned vessels, if a suitable storage location does not exist onboard, the Register may be held ashore. The Register is to be readily available for the attending surveyor.

(3) For Installation and Maintenance of Watertight Cable Transits, it is to be confirmed that:

(A) Cable transits have been installed, and where disrupted have been reinstated, in accordance with the manufacturer's requirements and in accordance with the requirements of Type Approval.

(B) Where specified, appropriate specialized tools have been used.

**2. Any penetration used for the passage of heat-sensitive piping systems through a watertight bulkhead or deck on a passenger ship *(2024)***

(1) Any penetration used for the passage of heat-sensitive piping systems through a watertight bulkhead or deck on a passenger ship under SOLAS Ch. II-1 Reg. 13.2.3 shall be tested with the heat-sensitive piping and shall be type approved for watertight integrity specified in **Ch 3, Sec 41** of **Guidance for Approval of Manufacturing Process and Type Approval, Etc.** after fire test specified in **Ch 3, Sec 26, Table 3.26.3** "Pipe and duct penetrations" of the same Guidance.

In addition, prototype testing for fire test and watertightness test need not be carried out if the pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and there are no openings. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division.

See also SOLAS Ch. II-2 Reg. 9.3.1 with respect to piping. However, the penetration must still comply with the watertight integrity requirement in SOLAS Ch. II-1 Reg. 2.17.

(2) SOLAS Ch. II-1 Reg. 13.2.3 shall be applicable to heat-sensitive piping systems and shall not be applied to cable penetrations in watertight bulkheads and decks.

(3) Above piping penetrations have been installed, and where disrupted have been reinstated, in accordance with the manufacturer's requirements and in accordance with the requirements of Type Approval.

## 307. Stability *(2023)*

**1.** In the Classification Survey during Construction for passenger ships and ships of 24 m and above in length other than passenger ships, stability experiments are to be carried out upon completion of the ship. A final stability information booklet adequate for the service intended and prepared on the basis of the stability particulars determined by the results of stability experiments, is to be approved by the Society and supplied to the master. However, a preliminary stability information booklet approved by the Society in lieu of a final stability information booklet may be provided on-board for a specific period.

Note :

1) In application to 1 above, the requirements shall not apply to the following ships not engaged on international voyage and less than 24 meters in length.

(1) Tug boat, Salvage, Dredger or Survey ship
(2) Steel barges
(3) Ships other than passenger ships or car ferries operating in water area within lakes, rivers and harbours
(4) Floating structures used for the storage in bulk of oil or waste etc.
(5) Floating structures used for the storage in bulk of dangerous goods

2) Stability experiments stated in the Rules mean inclining experiments and rolling tests. Where the rolling period could be calculated in accordance with the formula specified in 2008 IS Code Part A, the rolling tests may be dispensed with except those specially required by the Society.

**2.** The preparation and approval of stability booklets in above **Par 1** are to demonstrate that their intact stability is adequate for the service intended. Adequate intact stability means compliance with standards laid down by the relevant Administration or those of the Society taking into account the ship's size and type. The level of intact stability for ships with a length of 24 m and above should not be less than that provided by Part A of IMO Res. MSC.267 (85) (Adoption of the international code on intact stability, 2008) as amended by MSC.319(89), MSC.398(95), MSC.413(97), MSC.414 (97), MSC.415(97), MSC.443(99) and MSC.444(99) as applicable to the type of ship being considered.

Where other criteria are accepted by the Administration concerned, these criteria may be used for the purpose of classification. Evidence of approval by the Administration concerned may be accepted for the purpose of classification. *(2025)*

**3.** Where an loading instrument having a stability computation capability as supplemental use of stability information booklet specified in **Par 1** is provided, the test report of representative operational conditions is to be submitted to the Society, and the loading instrument shall cover all stability requirements applicable to the ship such as intact, damage and grain stability, etc.

When the stability information include sufficient loading conditions of the ship, some part of the function may be omitted. The instrument is to be confirmed by the Surveyor upon installation in accordance with the test report approved by the Society. Where a loading instrument is installed onboard, the approval and survey procedures are given in **Annex 1-10** of the Guidance. *(2021)*

## 308. Trials

Trials are to be carried out for all equipment, machinery and electrical equipment under working conditions after completion of the ship in order to ascertain their performances. In the sea trials, speed test, astern test, steering test, emergency steering test and turning test are to be carried out. In addition, the operating conditions of machinery and other behaviors of the ship during the trial are to be examined.

## 309. In Case of Dual Class Vessel (2025) 【See Guidance】

**1.** Each Society acts on behalf of the other Society in accordance with the trilateral agreement adopted by the two Societies and the shipyard. This agreement shall clearly define modalities such as submission of plans, rules to be applied, harmonizing and resolution of plan approval comments between societies. A format for the minimum content of a trilateral agreement refers to IACS Procedural Requirements (PR) 1B Annex 5; *(2025)*

**2.** Plans and documents related to classification requirements are to be submitted to each Society by the shipyard; *(2025)*

**3.** One set of plans and documents fully approved by the First Society shall be provided to the Second Society by the shipyard and each Society is to perform review and approval of plans based on its own classification Rules. As a minimum scope, the approval of the plans listed in **Ch 1, 309** of the Guidance is required by the Second Society to verify compliance with its applicable classification Rules. The Second Society is to record written documentary evidence of the abovementioned plans which were approved as complying with the Second Society's own Rules or with other requirements confirmed acceptable in accordance with its own Rules; *(2025)* 【See Guidance】

4. Each Society is to perform the survey during fabrication, construction and testing of the vessel based on its own classification Rules and in accordance with the work agreed by the two Societies and described in the trilateral agreement, and/or the bilateral agreement adopted by the two Societies, if any; *(2025)*

5. Each Society is to provide to the other Society information and records related to the Classification Survey during Construction such as plan approval including following up and closing of comments imposed, surveys, inspection, witnesses and tests etc., to perform the surveys and verify compliance with the relevant requirements;

6. Each Society is to issue an Interim Certificate of Classification for the vessel upon satisfactory completion of the Classification Survey during Construction and full records being provided by both Societies respectively: *(2025)*

7. Records in relation to the provisions of above paragraphs are maintained, demonstrating achievement of the requirements in the items covered by the services performed, as well as the effective operation of the quality system; and *(2025)*

8. In case of termination of the trilateral agreement, this should be officialised by a document signed by all the involved Parties. In case whereby the First Society would not be involved anymore, the Second Society would have to take full responsibility for the classification of the ship(s) and might sign a MoU with the shipyard as per IACS Procedural Requirements 42 (Procedure for Assigning Class for a New Building project when the design is already approved by an Initial Society (Based on the Classification Rules and a Memorandum of Understanding (MoU) Between a Class Society, a Shipyard and, if applicable, a Ship Owner).

   The same applies if the shipyard wishes to withdraw some ships from the trilateral agreement. *(2025)*

## 310. Acceptance of design approved by other Societies *(2023)*

1. For a vessel with the design as previously approved by any Society which is subject to verification of compliance with QSCS(Quality System Certification Scheme) of IACS, the Society is to be applied for the separate procedures as specified by the Society or the IACS Procedural Requirements(PR) 42 (Procedure for Assigning Class for a New Building project when the design is already approved by an Initial Society (Based on the Classification Rules and a Memorandum of Understanding (MoU) Between a Class Society, a Shipyard and, if applicable, a Ship Owner). *(2025)*

# Section 4 Classification Survey after Construction

## 401. Classification Survey after Construction 【See Guidance】

**1.** In the Classification Survey after Construction, the actual scantlings of main parts of the ship are to be measured in addition to such examinations of the construction, materials, workmanship and actual conditions of hull, machinery, outfittings and equipment "as required for the Special Survey" corresponding to the ship's age in order to ascertain that they meet the relevant requirements in the Rules. *(2023)*

Note : The term "as required for the Special Survey" means to carry out the relevant survey of Special Survey including thickness measurements, Docking Survey, Surveys of Propeller Shaft and Stern Tube Shaft, Etc., Boiler Survey of which is to be based on the age and type of the vessel.

**2.** The Society may request further examinations, tests and measurements, including but not limited to material testing, non-destructive testing, hydraulic and hydrostatic tests and sea trial.

However, in case of passenger ships subject to the Korean Ship Safety Act, sea trial shall be carried out as specified by the Society. *(2023)*

## 402. Submission of plans 【See Guidance】

In the Classification Survey after Construction, plans and documents as may be required for Classification Survey during Construction are to be submitted. If plans cannot be obtained, facilities are to be given for the Surveyor to take the necessary informations from the ship.

## 403. Classification Survey of ships classed by other Societies or TOC(Transfer of Classification) *(2017)* 【See Guidance】

When a ship holding class with any Society which is subject to verification of compliance with QSCS(Quality System Certification Scheme) of IACS is intended for classification, plans and documents to be submitted and survey items, etc. are to be in accordance with the Guidance relating to the Rules.

In case of Passenger Ships and Fishing Vessels, the procedures pertaining to "TOC" shall be applied. But survey items are to be in accordance with **401.** Classification Survey after Construction.

## 404. Stability *(2023)*

In the Classification Survey after Construction for passenger ships and ships of 24 m and above in length other than passenger ships, stability experiments are to be carried out. A final stability information booklet adequate for the service intended and prepared on the basis of the stability particulars determined by the results of stability experiments, is to be approved by the Society and supplied to the master.

However, a preliminary stability information booklet approved by the Society in lieu of a final stability information booklet may be provided on-board for a specific period. Stability experiments may be dispensed with provided that "sufficient information based on previous stability experiments" is available and neither alteration nor repair affecting the stability has been made since the previous experiments.

Note :

1) Stability criteria and a standardized form of the stability information booklet are to comply with the requirements given in **307.**

2) The term "the sufficient information based on previous stability experiments" means the information on stability experiments approved by any Society which is subject to verification of compliance with QSCS(Quality System Certification Scheme) of IACS or the relevant flag state(including recognized organizations authorized by the relevant flag state to act on its behalf)

# Section 5 Certificates and Reports

## 501. Certificate of Classification

1. Where ships have undergone the Classification Survey during or after Construction to the satisfaction of the Surveyor and approved by the Classification Committee, the ships will be classed and entered in the Register of Ships with the issue of the Certificate of Classification.
2. Where ships have undergone the Special Survey to the satisfaction of the Surveyor, the Certificate of Classification is issued newly.

## 502. Interim Certificate of Classification *(2020)*

1. Where ships have undergone a Classification Survey during or after Construction to the satisfaction of the Surveyor, the Interim Certificate of Classification will be issued to permit the ship to trade while the Certificate of Classification is prepared.

## 503. Conditional Certificate of Classification *(2020)*

1. A Conditional Certificate of Classification is to be issued where a single direct voyage to a repair yard/survey port/another place of laid-up or demolition yard, etc., in lieu of a Classification Certificate. In this case, "a single direct voyage is allowed" means the cases as specified in **901. 5** or **7**.
2. In addition, where deemed necessary by the Society, it issues the Conditional Certificate of Classification as specified by the Society

## 504. Certificate for construction survey

Where ships not intending to be classed have undergone the survey during construction, or marine engines, boilers, auxiliary machinery and outfittings have undergone the surveys during construction to the satisfaction of the Surveyor, the Certificate for Construction Survey will be issued.

## 505. Survey reports *(2019)*

On completion of the Classification Survey and the surveys assigned to maintain the classification, the Survey Reports will be issued. Ship's particulars, survey results, the date and description of the next surveys, etc. are to be stated in the Survey Reports.

The Owner can get relevant information on "KR e-Fleet'(Website).

## 506. Keeping of the certificates and survey reports *(2020)*

The Certificate of Classification(incl. the Interim Certificate of Classification or the Conditional Certificate of Classification), Particular Sheets and Survey Reports, etc. are always to be kept on board by the master of the ship and are to be produced when requested by the Surveyor.

Keeping Method on board is Electronic or hard copy format.

## 507. Mention on certificate

1. Where ships classed with the Society have satisfactorily undergone the periodical survey, or where the period of validity of the Certificate of Classification is extended, or where the anniversary date is amended, the periodical survey or the case will be endorsed on the Appendix of Certificate of Classification or Interim Certificate of Classification.
2. Assigning of date of build
   (1) The year, month and date at which the Classification Survey during Construction is completed shall be specified as the "Date of Build". Where there is substantial delay between completion of the Classification Survey during Construction and the ship commencing active service, the date of commissioning may be also specified.

(2) Where the ship is altered, the Date of Build shall be remain assigned to the ship and the altered parts are to be complied with **Ch 2, Sec 12.**

### 508. Re-issue and return of certificate *(2020)*

1. When the Certificate of Classification(incl. the Interim Certificate of Classification or the Conditional Certificate of Classification), Particular Sheets, or Survey Reports are lost or impaired, or when the items stated in them require alteration, the application for re-issue must be made without delay.
2. When a ship holding the Interim Certificate of Classification or the Conditional Certificate of Classification, is furnished with the Certificate of Classification, when the certificate is re-issued except in the case of its loss, or when the classification is cancelled, the old certificate is to be returned to the Society without delay.

### 509. Certificates of related equipment

The Society may, upon application, survey such equipment relating to ships as prime movers, shaftings, boilers, pressure vessels, auxiliary machinery, electrical equipment and other machinery installations and issue certificates where they are to the satisfaction of the Surveyor.

### 510. Class Maintenance Certificate *(2023)*

The Society will issue a Class Maintenance Certificate after the confirmation on the effective maintaining of class according to the rules is made when the Owner of a ship or the person having obtained the Owner's consent applies for it.

## Section 6 Application for Survey

### 601. Classification Survey *(2021)*

The application for Classification Survey is to be made by the Builder for a ship during construction and by the Owner for a ship after construction. The application is to be submitted in writing to the Society. But, ships subject to Classification Survey are to be applied for the separate requirements as specified by the Society and the Society reserves the right to decline or cancel the application where deemed necessary by the Society as follows: *(2025)*

1. Where the requested survey is not progressed after the application has been submitted so the intention of the survey application is not clear
2. Where the survey fees are not paid,
3. The ship is not complied with the requirements of the Society, etc.

### 602. Periodical and other surveys *(2021)*

The application for surveys of ship for the continuation of her classification is to be made by the Owner. The application is to be submitted in writing to the Society. But, the Society reserves the right to decline the application where deemed necessary by the Society as follows:

1. Where the requested survey is not progressed after the application has been submitted so the intention of the survey application is not clear
2. Where the survey fees are not paid
3. The procedure for suspension/withdrawal specified in **Sec 9** of the Rules is to be applied to the ship, etc.

### 603. Re-issue of certificate *(2020)*

The application for re-issue and return of the Classification Certificate(incl. the Interim Certificate of Classification or the Conditional Certificate of Classification), Particular Sheets and Survey Reports are to be made by the Owner.

# Section 7 Responsibilities and Cooperation Duties of the Owners

## 701. General *(2020)*

1. The classification of a ship is based on the understanding that the ship is loaded, operated and maintained in a proper manner by competent and qualified seafarers or operating personnel in accordance with the environmental, loading, operating and other criteria on which classification is based.

2. It is the responsibility to ensure that the *International Convention for Load Lines, Safety of Life at Sea*, other related Conventions and other related governmental regulations are maintained in an appropriate state including ensuring the validity of all relevant and applicable statutory certificates.

3. It is the responsibility to ensure proper maintenance of the ship until the next survey required by the Rules, including ensuring the validity of the all relevant and applicable class certificates.

## 702. Report items

When any of the following cases occurs, the Owner is to report to the Society without delay:

(1) When the ship is sustained with a sea casualty by which her present class is deemed affected.
(2) When any areas which is to be "promptly and thoroughly repaired" specified in **Ch 2, 108. para 2.** are found (in association with wastage over the allowable limits). *(2020)*

(3) When hull structural damage that may affect the integrity of watertight or weathertight is found. *(2020)*
(4) When the ship is placed in drydock or on a slipway.
(5) When the ship is laid up or dismantled.
(6) When the Owner is changed.
(7) When the ship is withdrawn.
(8) When any items which may affect her class are changed.

## 703. Cooperation of survey

1. All such preparations as required for Classification Survey and surveys necessary for the maintenance of class are to be made by the applicant of the survey in accordance with the requirements of the Rules. To permit safe and effective survey, such preparations are to include the provision of the work environment and safety measures in the way of suitable lighting, ventilation and access condition.

2. The Owner, master, chief engineer or their representatives are to attend the survey according to the items to be examined and are to give necessary assistances.

3. When a ship is to be surveyed, it is the duty of the Owner to inform the Surveyor of the correct place and items of survey.

4. Where it is intended to use service suppliers for the survey of ship, the service suppliers approved by the Society are used as a general rule, and the approval procedure and items are to be in accordance with the Guidance for **Approval of Service Suppliers**. *(2021)*

5. The applicant of the survey is to ensure that there is no falsehood in the description on the application form, the notice and the presented data, etc. to the Society.

## 704. Cooperation Duties *(2017)*

Notwithstanding the general duty of confidentiality owed by the Society to its clients as specified in **806.**, the Society's clients hereby accept that the Society will participate in Early Warning Scheme which requires each Society to provide the involved Societies (the Classification Societies classing a sister or a similar ship to the one involved in the incident) with relevant technical information (but not including any drawings relating to the ship which may be the specific property of another party) on serious hull structural and engineering systems failures, as defined in the Early Warning Scheme (Refer to IACS PR No.2A Procedure for Hull Failure Incident Reporting and PR No.2B Procedure for Early Warning of Serious Hull Failure Incidents – "Early Warning Scheme – EWS") to enable such useful information to be shared and utilized to facilitate the proper working of Early Warning Scheme.

The Society will provide its client with written details of such information upon sending the same to the involved Societies.

# Section 8 Competence, and Duties of Surveyors and Responsibility and Scope of Classification *(2021)*

## 801. Competence of Surveyors 【See Guidance】

1. Upon receiving an application for survey, the Surveyor may conduct survey at all reasonable times. *(2021)*
2. The Surveyor may suspend surveys when the necessary preparations required in the Classification Technical Rules have not been made or any appropriate attendant is not present. *(2021)*
3. The Surveyor may, if deemed necessary by the condition of a classed ship, request additional surveys of a part though such part may not fall under the survey items.
4. The Surveyor will notify the survey applicant of his recommendations for repairs or renewals when the hull, machinery or other equipment are in conflict with the requirements of the Classification Technical Rules, damaged, or worn out. Upon this notification the applicant is to carry out the repairs to the satisfaction of the Surveyor. *(2021)*

## 802. Duties of Surveyors

1. The Surveyor is to undertake relevant surveys when there is an application for survey of a Classification Survey during/after Construction or a classed ship or materials, equipments etc. *(2021)*
2. For the convenience of the Owner, the Surveyor is to avoid any unnecessary duplication of surveys or repair works in carrying out his surveys.

## 803. Liability of Classification Society

1. (Liability) The Society shall be responsible for damage or loss incurred by the shipowner arising from a negligence of the Society. The liability will be limited to the greater of an amount equal to 10 times the sum actually paid for services alleged to be deficient, or USD 1,000,000.
2. The limitation on liability specified in **Par 1** does not apply in case of a willful act or imprudent feasance despite being cognizant of the fact that there is a concern for damage, or nonfeasance.
3. (Time bar) Rights of claims against the survey and other contracted services provided by the Society shall become nullified after 6 months from the date when the Owner had notice of the damage.
4. (Jurisdiction and Governing laws) All disputes which may arise from the services by the Society shall be subject to the exclusive jurisdiction of Korean court and be governed by the Laws of Korea.

## 804. Scope of Classification *(2021)*

1. The Society is not an insurer or guarantor of the integrity or safety of a vessel or of any of its equipment or machinery. The validity, applicability, and interpretation of any certificate, report, plan or document review or approval are governed by the Rules, Guidances and standard of the Society who shall remain the sole judge thereof.
2. The Society only is qualified to apply its Rules and to interpret them. Any reference to them has no effect unless it involves the Society's intervention.
3. The Society accepts no responsibility for the use of information related to its Services which was not provided for the purpose by the Society or with its assistance.

## 805. Independence of Classification Society

The Society and its staff shall not be affected by designer, manufacturer, supplier, installer, purchaser, owner, user, maintainer and any other individuals of the item subject to the service and shall perform its works for the customers fairly from independent position.

## 806. Confidentiality

The Society and its staff shall not be perused, transferred or disclosed the confidential information obtained through the handling of records to the third party without the consent of the relevant customer, unless otherwise requested by the national Administration, investigative agency or a law court.

## 807. Use of ship's information

The Society may release vessel specific information related to the classification and statutory certification status. This information may be published on the Society's web-site or by other media and may include the information related the vessel's classification, the names, dates and locations of all surveys performed by the Society, the expiration date of all classification and statutory certificates issued by the Society, survey due dates, transfer, suspensions, withdrawals and reinstatements of class.

## 808. Provide with submitted plans and documents

The Society may provide the copy of the submitted plans and documents as considered necessary by the Society for the maintenance of the ship at the request of the Owner.

# Section 9 Suspension/Withdrawal of Class and Reclassification

## 901. Suspension/Reinstatement of class

**1.** The classification is automatically suspended.

(1) when the Special Survey has not been completed by the due date or by the expiry date of any extension granted in **Ch 2, 401. 1** unless the vessel is under attendance for completion of the Special Survey prior to resuming trading by the due date or by the expiry date of any extension granted in **Ch 2, 401. 1**.

(2) when the Annual Survey or Intermediate Survey has not been completed by the end of the corresponding survey time window unless the vessel is under attendance for completion of the Annual Survey or Intermediate Survey by the end of the corresponding survey time window.

Classification will be reinstated upon satisfactory completion of the surveys due. The Special Surveys to be carried out are to be based upon the survey requirements at the original date due and not on the age of the vessel when the survey is carried out. Such surveys are to be credited from the date originally due. However, the vessel is disclassed from the date of suspension until the date class is reinstated. *(2021)*

**2.** The classification may be suspended in accordance with the Society's suspension procedure. *(2020)*

Classification will be reinstated if the cause of such suspension are removed, or upon verification that the overdue survey has been satisfactorily dealt with. Suspension of class decided by the Society takes effect from the date when the condition for suspension of class are met and will remain in effect until such time as the class is reinstated once the due items and/or surveys have been dealt with.

(1) When a vessel is not operated in compliance with the rule requirements, such as in cases of services or conditions not covered by the class notation, or trade outside the navigation restrictions for which the class was assigned.

(2) When the Society considers that a ship has not complied with the Rules.

(3) When any damage to the ship is to such an extent as affecting her class and is not repaired in accordance with the Rules of the Society, or when alterations or conversions affecting her class are carried out without the approval of the Society.

(4) When a ship proceeds to sea with less freeboard than that assigned, or when the freeboard marks are placed higher on the sides of the ship than the position assigned.

(5) When the assigned surveys to maintain the classification, except Annual Survey, Intermediate Survey and Special Survey, is not dealt with, or postponed by agreement, by the due date.

(6) When the Continuous Survey item(s) due or overdue at the time of Annual Survey is not surveyed, or postponed by agreement.

(7) When failure to report to the Society without delay on the “Reports items” of the Responsibilities and Cooperation Duties of the owner specified in **Ch 1, 702.** *(2020)*

(8) When a ship is detained following a Port State Control inspection with serious deficiencies found *(2021)*

(9) When a ship for which statutory certificates have been withdrawn by the relevant Administration or a ship is operating with no certificate of ship's nationality without any special reason *(2021)*

(10) A ship that violates or is doubtful of violating sanctions, prohibitions, or restrictions imposed by a nation, international or supranational organizations. *(2022)*

(11) When it is judged that the Society may lose social credibility or be exposed to other negative situations due to a ship or shipowner. *(2022)*

(12) In the event of non-payment of fees

**3.** Vessels laid-up in accordance with the Society's Rules prior to surveys becoming overdue need not be suspended when surveys addressed above become overdue. However, vessels which are laid-up after being suspended as a result of surveys going overdue, remain suspended until the overdue surveys are completed.

**4.** When a vessel is dual classed and in the event that the other Society involved takes action to suspend the class of the vessel for technical reasons, the Society will, upon receipt of this advice, also suspend the class of the vessel in accordance with the Society's suspension procedure, unless it can otherwise document that such suspension is incorrect.

**5.** When a vessel is intended for a demolition voyage with any periodical survey overdue, the vessel's class suspension may be held in abeyance and consideration may be given to allow the vessel to proceed on a single direct ballast voyage from the lay up or final discharge port to the demolition yard. In such cases a Conditional Certificate of Classification with conditions for the voyage noted may be issued provided the attending Surveyor finds the vessel in satisfactory condition to proceed for the intended voyage.

**6. Force Majeure** ***(2020)***

If, due to circumstances reasonably beyond the owner's or the Society's control, the vessel is not in a port where the overdue surveys can be completed at the expiry of the periods allowed, the Society may allow the vessel to sail, in class, directly to an agreed discharge port, and if necessary, hence, in ballast, to an agreed port at which the survey will be completed, provided the Society:

(1) exams the ship's records;

(2) carries out the due and/or overdue surveys and examination of Conditions of Class at the first port of call when there is an unforeseen inability of the Society to attend the vessel in the present port, and *(2020)*

(3) has satisfied itself that the vessel is in condition to sail for one trip to a discharge port and subsequent ballast voyage to a repair facility if necessary.(Where there is unforeseen inability of the Society to attend the vessel in the present port, the master is to confirm that his ship is in condition to sail to the nearest port of call.)

(4) If, due to force majeure conditions such as Pandemic (e.g. COVID-19), the due survey of the vessel can not be completed at the expiry of the periods allowed, the Society may allow the vessel to sail, in class until the agreed period under the following conditions: *(2023)*

(A) approval by the relevant flag state (if applicable)

(B) exams the ship's records

(C) carries out the due and/or overdue surveys and examination of Conditions of Class at the first port of call with available facilities where Surveyor can reasonably attend to complete.

(D) review of evidence provided by the Owner confirming that the vessel is in a satisfactory condition in class for the agreed period of postponement (where the Society may request remote survey or acceptable photo, video or other evidence of condition of structures or equipment)

(E) obtain written statement from the Master stating that the vessel is in compliance with the Rules and Regulations of the Society and is in condition to satisfactorily continue in service for the agreed period.

The surveys to be carried out are to be based upon the survey requirements at the original date due and not on the age of the vessel when the survey is carried out. Such surveys are to be credited from the date originally due.

If class has already been automatically suspended in such cases, it may be reinstated subject to the conditions prescribed in this paragraph.

**7.** When a vessel is intended for a single voyage from laid-up position to a repair yard or another place of lay-up with any periodical survey overdue, the vessel's class suspension may be held in abeyance and consideration may be given to allow the vessel to proceed on a single direct ballast voyage from the site of lay up to a repair yard or another place of lay-up, provided the Society finds the vessel in satisfactory condition after surveys, the extent of which are to be based on sur-

veys overdue and duration of lay-up. A Conditional Certificate of Classification with conditions for the intended voyage may be issued. This is not applicable to vessels whose class was already suspended prior to being laid-up. *(2020)*

**8.** If the requirements relating to the optional notations are not satisfied, the optional notations may be suspended or withdrawn only and the Classification shall be maintained. *(2018)*

## 902. Withdrawal of class 【See Guidance】

**1.** The classification may be withdrawn under the approval of the Classification Committee.

(1) when class of a vessel has been suspended for a period of six(6) months. A longer suspension period may be granted when the vessel is not trading as in cases of lay-up, awaiting disposition in case of a casualty or attendance for reinstatement.

(2) when the vessel is reported as a constructive total loss.
(3) when the vessel is lost.
(4) when the vessel is reported scrapped.
(5) when the Surveyor reports that the vessel has not complied with the Rules of the Society as regards surveys to maintain the classification specified in **Ch 2, 103.**

(6) When a ship is detained following a Port State Control inspection with serious deficiencies found *(2021)*
(7) When a ship for which statutory certificates have been withdrawn by the relevant Administration or a ship is operating with no certificate of ship's nationality without any special reason *(2021)*

(8) A ship that violates or is doubtful of violating sanctions, prohibitions, or restrictions imposed by a nation, international or supranational organizations. *(2022)*

(9) When it is judged that the Society may lose social credibility or be exposed to other negative situations due to a ship or shipowner. *(2022)*

**2.** Notwithstanding **Par 1**, the class may be withdrawn from the Society in consequence of a request from the Owner.

## 903. Deferment for Class Withdrawal *(2021)*

In the case of a fishing vessel that is in operation for a long period of time, when submitting the survey plan and documents certifying that she is being operated, a longer suspension period may be granted by an approval of the Classification Committee.

## 904. Reclassification

When reclassification is desired for a ship for which the class previously assigned has been withdrawn, the Society will carry out a survey for reclassification, appropriate to the age of the ship and condition of the ship and the circumstances of the case. If, at such survey, the ship be found in good and efficient condition in accordance with the requirements of the Rules, the Society will be prepared to reinstate her classification.

## Section 10 Fees

### 1001. Survey fees

1. When the surveys or testing of materials are carried out by the Surveyor, fees will be charged for the surveys, testing of materials, and the certificates issued in accordance with separately established Tariff of Fees.
2. When travelling is required on account of a survey, the travelling expenses, communication expenses, and other expenses incurred by such travel will be charged.
3. When the attendance of a survey is required to suit the convenience of the Owners, outside of normal working hours or on holidays, an extra fee will be charged.

### 1002. Fees for plan approval

In the case of plans and other documents approval by the Society, fees will be charged in accordance with separately established Tariff of Fees.

## Section 11 Appeal on Disagreement

### 1101. Appeal on disagreement

In case of disagreement between the Owners or Builders and the Surveyor regarding the application of the Rules, materials, workmanship and extent of repairs, etc. relating to any survey carried out by the Society, an appeal may be made to the Society.

### 1102. Re-survey

The Society will carry out re-survey when an appeal on disagreement is made.

### 1103. Fees for re-survey

The fees and expenses of re-survey are to be paid by the party appealing.

## Section 12 Related Regulations, Conventions, etc. and Surveys *(2022)*

### 1201. Governmental regulations

The Society may require to apply governmental regulations for items not specified in the Rules.

### 1202. International conventions

1. Following ships classed or intended to be classed with the Society are to meet the International Convention for Load Lines, Safety of Life at Sea and other related conventions,

   (1) Ships flying Korean flag to which the conventions apply.
   (2) Ships flying foreign flags, to which the conventions apply, where the Society is authorized by the concerned Governments to issue certificates and requested by the Owner.

2. Unless explicitly stipulated otherwise in the text of the regulations in the International Convention for the Safety of Life at Sea, Load Lines and the Prevention of Pollution from Ships and any of their mandatory Codes, distances are to be measured by using moulded dimensions.

### 1203. IACS Unified Interpretations

1. Ships classed with the Society are to be complied with the International Association of Classification Societies(IACS) Unified Interpretations(UIs) applicable to a ship, its machinery and equipment, in accordance with the implementation dates and provisions stated in the UI, when the Society is acting as a recognized organization, authorized by a flag State Administration to act on its behalf, unless provided with written instruction to apply a different interpretation by the flag Administration.

2. The requirements specified in **Par 1** above does not require the application of IACS UIs to ships retroactively, except for those UIs which explicitly require retroactive application.

## Section 13 Classification of Other Installations or Equipment

### 1301. Classification *(2021)*

The Society may, upon application, survey such installations or equipment other than those relating to ship as mobile offshore drilling units, mobile offshore units, fixed offshore structures, dredgers, floating docks and other installations or equipment, and they will be registered to the Society with the issue of Certificate of Classification where they are in satisfaction of the Surveyor. In this case, **Annex 1-1** of the Guidance is to be referred for the assignment of the class notation.

### 1302. Certificates and reports

Where the installations or equipment have undergone the Classification Survey during or after Construction to the satisfaction of the Surveyor in accordance with the requirement in **1301.** the certificates and reports will be issued according to the requirements of **Sec 5**.

### 1303. Construction and survey *(2023)*

Constructions and surveys of installations or equipment intending to be registered are to be in accordance with "the Guidance" relating to the Rules.

Note : The term "the Guidance" means the requirements specified in related Classification Technical Rules.

### 1304. Maintenance of classification *(2023)*

Installations or equipment classed to the Society are to be upon the examination at the surveys assigned to maintain the classification in accordance with "the requirements specified by the Society". The application for survey is to be made by the Owners or managers in substitute for the Owners.

Note : The term "the requirements specified by the Society" means the requirements specified in the relevant Classification Technical Rules of the Society.

### 1305. Related requirements

The requirements specified in **Sec 6** to **Sec 11** are applicable to the installations or equipment stated in this Section.

## Section 14 External Audit

### 1401. External Audit

1. The auditors of external body such as flag state administration, etc. may conducts audits of processes followed by the Society to assess the degree of compliance with the relevant audit requirements.
2. Auditors of **Par 1** may accompany KR personnel at any stage of work which may necessitate the auditors having access to a vessel or access to the premises of a manufacturer or shipbuilder. In such instances, prior authorization for the auditor's access and any necessary assistances will be sought by the Society.

## Section 15 Miscellaneous

### 1501. New installation of materials containing asbestos

1. This requirement is to apply to materials used for the structure, machinery, electrical installations and equipment.
2. For all ships, new installation of materials which contain asbestos is to be prohibited. ⚓

# CHAPTER 2 PERIODICAL AND OTHER SURVEYS

## Section 1 General

### 101. Application *(2023)*

**Ch 2** and **Ch 3** apply to all self-propelled vessels, unless otherwise specified elsewhere.

### 102. Definitions

The definitions of terms used in **Ch 2** and **Ch 3** are to be as specified in the followings, unless otherwise specified elsewhere.

1. **Anniversary date** means the day and the month of each year which will correspond to the due date of the next Special Survey from the completion date of the initial Classification Survey or of the Special Survey.

2-1. **Bulk carrier** means a ship which is constructed generally with single deck, double bottom, topside tanks and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk. Combination carriers are included. For single skin combination carriers additional requirements are specified in **Ch 3, Sec 3.** Ore and combination carriers are not covered by the IACS Common Structural Rules for Bulk Carriers(**Pt 11**). *(2020)*

2-2. **Double Skin Bulk Carrier** is a ship which is constructed generally with single deck, double bottom, topside tank and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk, including such types as ore carriers and combination carriers, in which all cargo holds are bounded by a double-side skin (regardless of the width of the wing space).

For combination carriers with longitudinal bulkheads additional requirements are specified in **Sec 3** or **Sec 5,** as applicable. Ore and combination carriers are not covered by the IACS Common Structural Rules for Bulk Carriers(**Pt 11**). *(2020)*

(Common for **2-1** & **2-2**) The following ships are not covered by the IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**).

- Ore carriers
- Combination carriers
- Wood chip carriers
- Cement, fly ash and sugar carriers provided that loading and unloading is not carried out by grabs heavier than 10 tons, power shovels and other means which may damage cargo hold structure
- Ships with inner bottom construction adapted for self-unloading

2-3. **Self-unloading bulk carrier means** a ship which is constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended to carry and self-unloading dry cargoes in bulk. For unloading cargoes, the ship is equipped with a conveyor system and is to be complied with the requirements of **Pt 7, Ch 3** of the Rules. *(2021)*

3-1. **Oil tanker** means a ship which is constructed primarily to carry oil in bulk in cargo tanks forming an integral part of the ship's hull, including ship types such as combination carriers (Ore/Oil ships etc.) but ships carrying oil in independent tanks not part of the ship's hull, such as asphalt carriers, are excluded from the ships subject to the enhanced survey programme (ESP). *(2024)*

3-2. **Double hull oil tanker** is a ship which is constructed primarily for the carriage of oil in bulk, which have the cargo tanks forming an integral part of the ship's hull and is protected by a double hull which extends for the entire length of the cargo area, consisting of double sides and double bottom spaces for the carriage of water ballast or void spaces. *(2024)*

4. **Oil** means for the purpose of the Rules, means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products other than petrochemicals which are subject to the provisions of Annex II of MARPOL 73/78. *(2020)*

5. **Chemical tanker** means a ship constructed or adapted and used for the carriage in bulk of any liq-

uid product listed in **Pt 7, Ch 6, Sec 17.**

6. **Tanker** means a ship as constructed or adapted for the carriage in bulk of liquid cargoes of an inflammable nature. Oil Tankers, Combination Carriers, Chemical Tanker and Liquefied Gas Carriers are included in this category. *(2022)*

7. **General dray cargo ship** means carrying soild cargoes. For more details, refer to 1. (1) of **1501.** *(2022)*

8. **Liquefied gas carrier** means a ship constructed or adapted and used for the carriage in bulk of any liquid product listed in **Pt 7, Ch 5, Sec 19.**

9. **Ballast tank** is a tank that is being used primarily for salt water ballast.

   For Bulk Carriers and Double Skin Bulk Carriers subject to the requirements of **Ch 3, Sec 2 and Sec 6**, a **ballast tank** is a tank which is used primarily for salt water ballast, or, where applicable, a space which is used for both cargo and slat water ballast will be treated as a ballast tank when substantial corrosion has been found in that space. A Double Side Tank is to be considered as a separate tank even if it is in connection to either the topside tank or the hopper side tank.

   And For Oil Tankers, Chemical Tankers and Double Hull Oil Tankers subject to the requirements of **Ch 3, Sec 3, Sec 4 and Sec 5** respectively, a **ballast tank** is a tank which is used primarily for the carriage of salt water ballast. *(2023)*

10. **Space** is a separate compartment including holds and tanks. For Bulk Carriers and Double Skin Bulk Carriers subject to the requirements of **Ch 3, Sec 2 and Sec 6**, **spaces** are separate compartments including holds, tanks, cofferdams and void spaces bounding cargo holds, decks and the outer hull. *(2020)*

11. **Transverse section** includes all longitudinal members contributing to longitudinal hull girder strength, such as plating, longitudinals and girders at the deck, sides, bottom, inner bottom, hopper sloping, topside sloping and longitudinal bulkhead.

    For a transversely framed vessels, a **transverse section** includes adjacent frames and their end connections in way of transverse sections.

    An example of typical transverse section in way of cargo hold is shown **Fig 1.2.1** *(2020)*

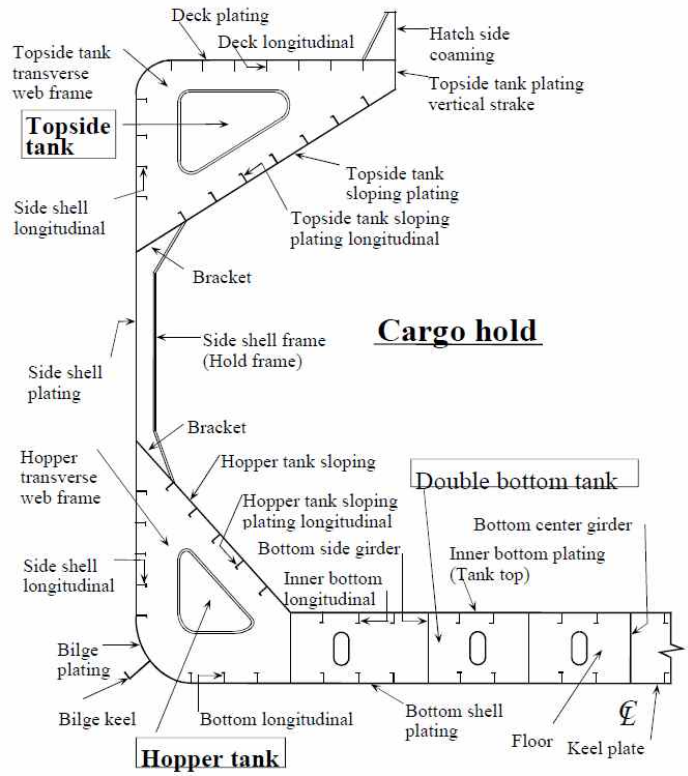



**Fig. 1.2.1 Typical transverse section in way of cargo hold (from IACS Rec. 76)**

12. **Representative space/tank** is a space/tank which is expected to reflect the conditions of other spaces/tanks of similar type and service and with similar corrosion prevention systems. When selecting representative spaces/tanks, account is to be taken of the service and repair history on board and identifiable critical structural areas and/or suspect areas.

13. **Suspect area** is a "location" showing substantial corrosion and/or is considered by the Surveyor "to be prone to rapid wastage". *(2023)*

Note : The term "location prone to rapid wastage" means one of the following cases among the location specified in **Annex 1-5, Table 2** of the Guidance:

1) Area with standing bilge water
2) Bulkheads facing fuel oil tanks being heated

14. **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. For vessels built under the IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), substantial corrosion is an extent of corrosion such that the assessment of the corrosion pattern indicates a measured thickness between $t_{ren} + 0.5\ \mathrm{mm}$ and $t_{ren}$.

Renewal thickness($t_{ren}$) is the minimum allowable thickness, in $\mathrm{mm}$, below which renewal of structural members is to be carried out.

15. **Excessive Corrosion** means corrosion that exceeds the allowable limit, so that steel is to be renewed. *(2020)*

16. **Extensive Area of Corrosion (Extensive corrosion)** means corrosion of hard and/or loose scale, including pitting, over 70% or more of the plating surface in question, accompanied by evidence of thinning. *(2020)*

17. **Overall Survey** means a survey intended to report on the overall condition of the hull structure and determine the extent of additional Close-up Surveys.

18. **Close-up Survey** means a survey where the details of structural components are within the close visual inspection range of the Surveyor, i.e. normally within reach of hand.

19. **Corrosion prevention system**

A corrosion prevention system is normally considered a full hard protective coating. Hard protective coating is usually to be epoxy coating or equivalent.

Other coating systems, which are neither soft nor semi-hard coatings, may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the manufacturer's specifications.

Where soft coating means a coating that remains soft so that is wears off at low mechanical impact or when touched; often based on oil(vegetable or petroleum) or lanolin(sheep wool grease) and semi-hard coating means a coating that dries or converts in such a way that it stays flexible although hard enough to touch and walk upon.

20. **Coating condition**[1] is defined as follows: *(2020)*

(1) **GOOD** condition with only minor spot rusting
(2) **FAIR** condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20 % or more of areas under consideration, but less than as defined for POOR condition
(3) **POOR** condition with general breakdown of coating over 20 % or more, or hard scale at 10 % or more, of areas under consideration

(Note) [1] : Reference is made to IACS Recommendation 87 - "Guidelines for Coating Maintenance & Repairs for Ballast Tanks and Combined Cargo/Ballast Tanks on Oil Tankers" *(2020)*

21. **Prompt and thorough repair** is a permanent repair completed at the time of survey to the satisfaction of the Surveyor, therein removing the need for the imposition of any associated Condition of Class. *(2020)*

**22. Enhanced survey programme** means, in addition to **Ch 2**, an enhanced survey method applied for hull structure and piping systems in way of cargo holds/tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area and all ballast tanks in accordance with **Ch 3.**

In addition, the related programme applies only to ships having integral tanks in the cargo area. And in accordance with Ch 3, 102. 1, the Owner in cooperation with the Society is to work out a specific survey programme prior to the commencement of related surveys.

Additionally ships subject to the Korean Ship Safety Act is to be also complied with the requirements of **Sec 19, 1901**. *(2021)*

**23. Critical structural area** is location which has been identified from calculations to require monitoring or from the service history of the subject ship or from similar ships or sister ships, if available, to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

**24. Special consideration or specially considered** (in connection with Close-up Surveys and thickness measurements) means sufficient close-up inspection and thickness measurements are to be taken to confirm the actual average condition of the structure under the coating.

**25. Air pipe head**

Air pipe heads installed on the exposed decks are those extending above the freeboard deck or superstructure decks.

**26-1. Cargo length area, ship carrying dry cargo ship** is that part of the ship which contains all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks pipe tunnels and void spaces. *(2020)*

**26-2. Cargo area, ship carrying liquid cargo in bulk** is that part of the ship which contains cargo tanks, slop tanks and cargo/ballast pump-rooms, compressor room, cofferdams, ballast tanks and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above mentioned spaces. *(2020)*

**27. General Corrosion(Overall Corrosion or Uniform Corrosion)** appears as a non-protective rust which can uniformly occur on tank internal surfaces that are uncoated, or where coating has totally deteriorated. The rust scale continues to break off, exposing fresh metal to corrosive attack. Thickness cannot be judged visually until excessive loss has occurred. An example of General corrosion is shown **Fig. 1.2.2** *(2020)*

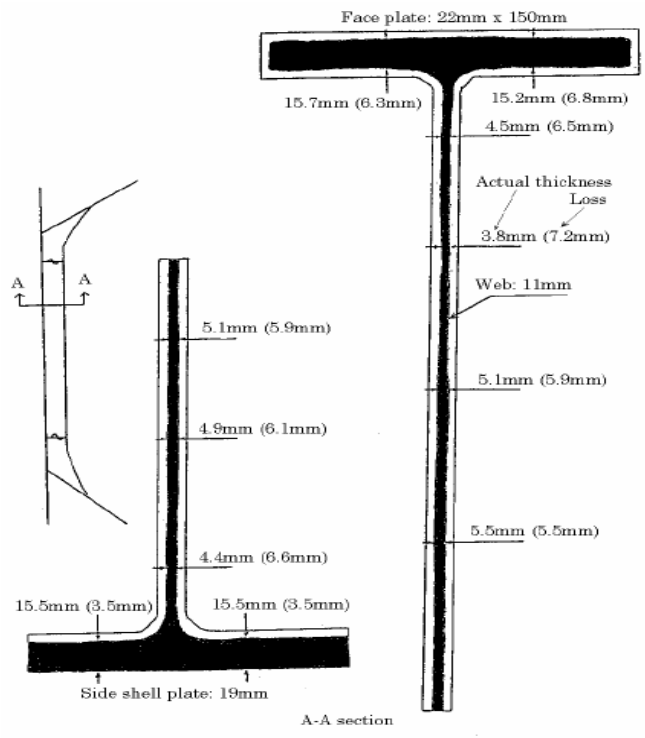



Fig. 1.2.2 General corrosion (from IACS Rec. 76)

**28. Pitting corrosion** is defined as scattered corrosion spots/areas with local material reductions which are greater than the general corrosion in the surrounding area. Pitting intensity is defined in **Fig 1.2.3.** *(2020)*

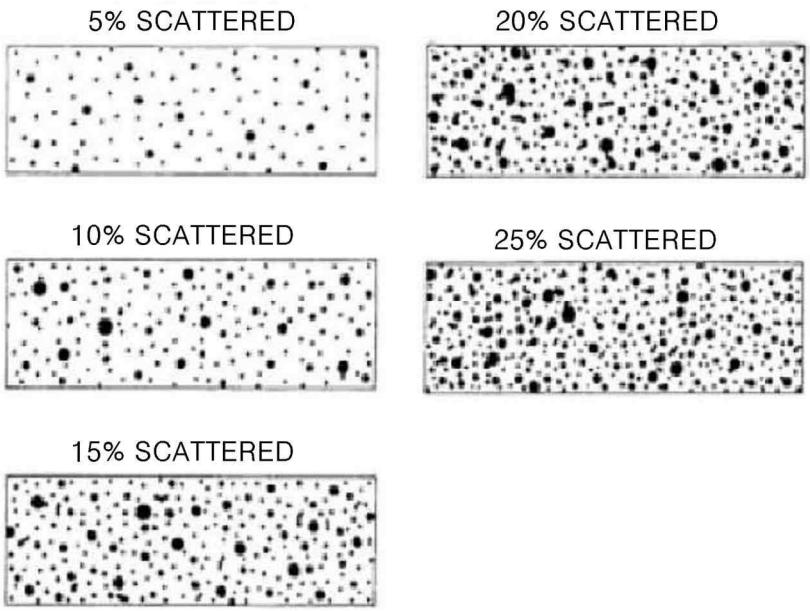



**Fig 1.2.3 Pitting intensity diagrams**

**29. Edge corrosion** is defined as local corrosion at the free edges of plates, stiffeners, primary support members and around openings. An example of edge corrosion is shown in **Fig 1.2.4.** *(2020)*

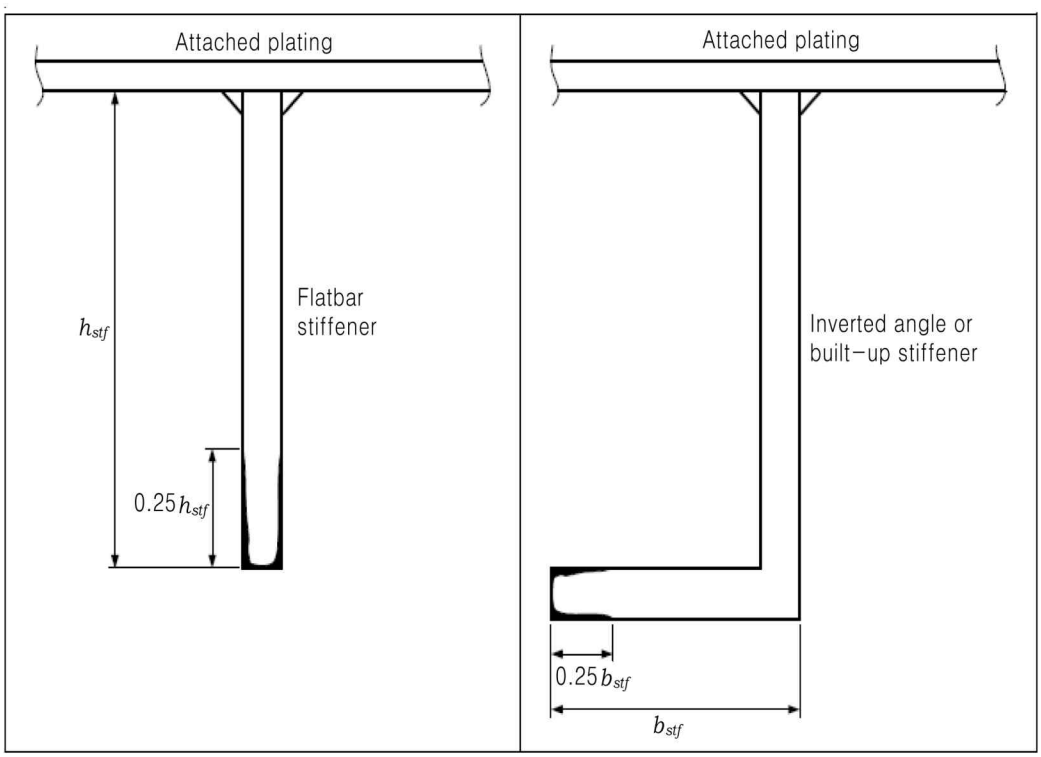



**Fig 1.2.4 Edge corrosion**

**30. Grooving corrosion** is typically local material loss adjacent to weld joints along abutting stiffeners and at stiffener or plate butts or seams. An example of grooving corrosion is shown in **Fig 1.2.5.** *(2020)*

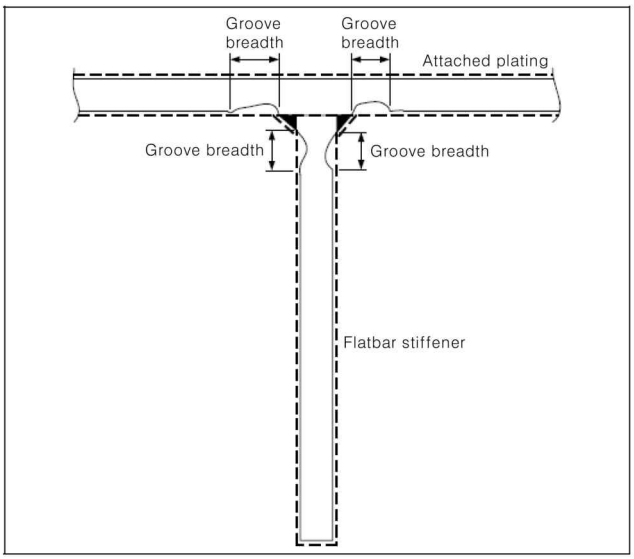



**Fig 1.2.5 Grooving corrosion**

**31. Length** *(2017)*

The length of ship (*L*) is the distance in metres on the load line from the fore side of the stem to the after side of the rudder post in case of a ship with rudder post, or to the axis of rudder stock in case of a ship without rudder post or stern post. L is not to be less than 96% and need not be grater than 97% of the extreme length on the load line. (i.e. length (L) as defined in **Pt 3, Ch 1, Sec. 102**)

**32. Remote Inspection Techniques(RIT)** *(2019)*

Remote Inspection Technique is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor(refer to IACS Rec.42).

**33. Remote Survey** *(2023)*

A "Remote Survey" is a process of verifying that a ship and its equipment are in compliance with the rules of the Classification Society where the verification is undertaken, or partially undertaken, without physical attendance on board the ship by a surveyor.

**34. Combined cargo/ballast tank** is a tank which is used for the carriage of cargo or ballast water as a routine part of the vessel's operation and will be treated as a ballast tank. Cargo tanks in which water ballast might be carried only in exceptional cases per MARPOL Annex I, Ch 4, Reg. 18.3 are to be treated as cargo tanks. *(2020)*

**35. Integral tanks** mean tanks that form a structural part of hull and influenced in the same manner by the loads that stress the adjacent hull structure. *(2020)*

**36. Independent tanks** mean self-supporting tanks. They do not form part of the ship's hull and are not essential to the hull strength. *(2020)*

**37. Membrane tanks** mean non-self-supporting tanks that consist of thin liquid and gastight layer (membrane) supported through insulation by the adjacent hull structure. *(2020)*

**38. Semi-membrane tanks** mean non-self-supporting tanks in the loaded condition and consist of a layer, parts of which are supported through insulation by the adjacent hull structure. *(2020)*

**39. Strength deck** means the deck at a part of ship's length is the uppermost deck at that part to which the shell plates extend.

However, in way of superstructures, except sunken superstructures, not exceeding o.15L in length, the strength deck is the deck just below the superstructure deck. The deck just below the super-structure deck may be taken as the strength deck even in way of the superstructure exceeding 0.15l in length at the option of the designer. *(2020)*

**40. Freeboard deck** means normally the uppermost continuous deck.

However, in cases where openings without permanent closing means exist on the exposed part of the uppermost continuous deck or where openings without permanent watertight closing means exist on the side of the ship below that deck, the freeboard deck is the continuous deck below that deck. For non-ordinary features of the freeboard deck, refer to the **Pt 3 Ch 1, 114**. *(2020)*

**41. Sheer Streak** means the top strake of a ship's side shell plating. *(2020)*

**42. Superstructure** means a decked structure on the freeboard deck, extending from side to side of the ship or having its side walls at the position not farther than 0.04 Bf from the side of ship. Raised quarter deck is to be considered as a superstructure. *(2020)*

**43. Deckhouse** menas a decked structure on the freeboard or superstructure deck which does not comply with the definition of a superstructure. *(2020)*

**44. Strake** means a course, or row, of shell, deck, bulkhead, or other plating. *(2020)*

**45. Wind and Water Strakes** mean the strakes of a ship's side shell between the ballast and the deepest load waterline. Generally the two(2) strakes located in the vicinity of the load waterline. Due to vessel's trim, the strakes may vary over the length of the vessel. An example of wind and water strakes is shown **Fig 1.2.6** *(2020)*

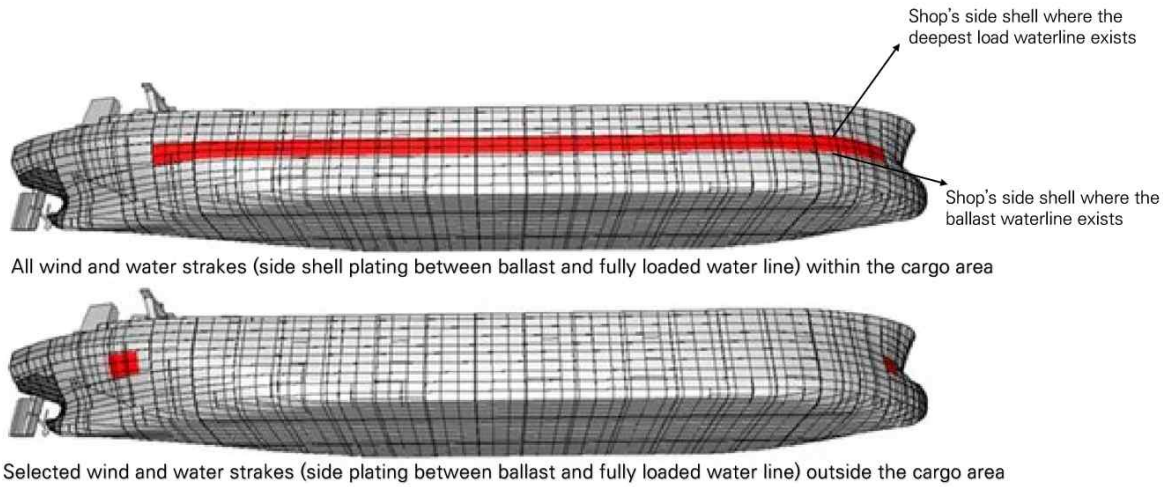



**Fig 1.2.6 Wind and Water Strakes (from the IACS Rec. 96)**

**46. Turret mooring** is a mooring method that allows only ship's angular movement relative to the turret so that it may be weathervane. The turret is generally connected to the seabed using a spread mooring system. *(2020)*

**47. Turret compartments** is those spaces and trunks that contain equipment and machinery for retrieval and release of the disconnectable turret mooring system, high-pressure hydraulic operating systems, fire protection arrangements and cargo transfer valves. *(2020)*

## 103. Kinds of surveys

Periodical and other surveys to maintain the classification are divided as follows;
(1) Special Survey
(2) Intermediate Survey
(3) Annual Survey
(4) Docking Survey
(5) Survey of Propeller Shaft and Stern Tube Shaft, Etc.
(6) Boiler Survey
(7) Continuous Survey(including Survey in accordance with the Planned Maintenance System)
(8) Occasional Survey
(9) Alteration Survey

## 104. Duplication of surveys

When heavier kind of survey is carried out at the due range or in advance of a periodical survey, the periodical survey may be dispensed with.

## 105. Execution of heavier survey *(2023)*

At the periodical survey, any items "as specially considered necessary by the Surveyor" or specially requested by the Owner may be inspected to the standard of heavier periodical surveys.

Note : The term "as specially considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801.** of the Guidance.

## 106. Laid-up ships *(2018)*

1. Where classed ships are laid-up and the ower notifies the Society of the fact, no normal periodical surveys are to be carried out during laid-up period.
2. Laid-up survey at the beginning of laid-up are to be performed in accordance with **Annex 1-17** of the Guidance. *(2021)*
3. In order to put the laid-up ship into service, the ship is to receive the re-commissioning survey in accordance with **Annex 1-17** of Guidance. *(2021)*
4. If the Owner does not notify the Society of the laid-up of the ship or the surveys as required in this Article is not implemented, the classification may be suspended or withdrawn in accordance with **Ch 1, Sec 9, 901.**
5. Laid-up attestation may be issued at the request of the Owner provided that the laid-up condition is in satisfactory after the laid-up survey with approved Laid-up Maintenance Program in accordance with **Annex 1-17** of the Guidance. *(2021)*

## 107. Tests

1. At the periodical survey, when the repair to the ship is likely to affect the ship's speed or safety, the speed trials and inclining experiment may be required.
2. If "significant repairs" are carried out to main or auxiliary machinery or steering gear, consideration is to be given to a sea trial to attending Surveyor's satisfaction. *(2021)*

   Note : "significant repairs" means the repairs may affect on the ship's speed or steering performance such as change of the main propulsion engine or the auxiliary engine, over 10% change of output of the main propulsion engine or the auxiliary engine, change of shape or main dimension of the propeller and change of the steering gear or steering capability.
3. If the significant repairs as stated in **Par 2**, is considered by the Society to have any impact on response characteristics of the propulsion systems, then the scope of sea trial is to also include a test plan for astern response characteristics based on those required for such an equipment or systems when fitted to the new ship. Refer to **Pt 5 Ch 1 103. 5** for astern testing requirements.

   The tests are to demonstrate the satisfactory operation of the equipment or system under realistic service conditions at least over the maneuvering range of the propulsion plant, for both ahead and astern directions.

   Depending on the actual extent of the repair, the Society may accept a reduction of the test plan. *(2018)*

## 108. Repairs

1. When the Surveyor recommends the necessity of repairs in consequence of the surveys, he is to notify the applicant the reasons of his recommendations and the applicant after such notification must receive the supervision of the Surveyor during the repairs.
2. Any damage in association with wastage over the allowable limits(including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which "affects or, in the opinion of the Surveyor, will affect the vessel's structural, watertight or weathertight integrity", is to be promptly and thoroughly repaired.

Areas to be considered include and in this case, see **Annex 1-18** of the Guidance for more specific areas. *(2021)*

(1) side shell frames, their end attachments and adjacent shell plating
(2) deck structure and deck plating
(3) bottom structure and bottom plating
(4) watertight or oiltight bulkheads
(5) hatch cover and hatch coamings
(6) items in **202. 1** (1) (f), (g) and (6)

(7) for bulk carriers and double skin bulk carriers;
- bottom structure and bottom plating
- side structure and side plating
- deck structure and deck plating
- inner bottom structure and inner bottom plating
- inner side structure and inner side plating
- watertight or oil tight bulkheads
- hatch covers and hatch coamings
- bunker and vent piping system, including ventilators

(8) for oil tankers, chemical tankers and double hull oil tankers;
- bottom structure and bottom plating
- side structure and side plating
- deck structure and deck plating
- watertight or oiltight bulkheads
- hatch covers or hatch coamings, where fitted

Note : "affects or, in the opinion of the Surveyor, will affect the vessel's structural, watertight or weathertight integrity" means the case where the Surveyor considered that the vessel's intended voyages or services are not able to be achieved safely because of the damages in vessel's structure, including buckling, grooving, detachment or fracture, or the lose of vessel's watertight or weathertight integrity.

**3.** For location where adequate repair facilities are not available, consideration may be given to allow the vessel to proceed directly to a repair facility. This may require discharging the cargo and/or temporary repairs for the intended voyage.

**4.** Additionally, “when a survey results in the identification of structural defects or corrosion, either of which, in the opinion of the Surveyor, will impair the vessel's fitness for continued service”, remedial measures are to be implemented before the ship continues in service. *(2021)*

Note : "when a survey results in the identification of structural defects or corrosion, either of which, in the opinion of the Surveyor, will impair the vessel's fitness for continued service" means the case where the Surveyor considered that the vessel's intended voyages or services are not able to be achieved safely because of defects or corrosion identified from the survey results.

**5.** Where the damage found on structure mentioned in **Par 2** is isolated and of a localized nature which does not affect the ship's structural integrity(as for example a minor hole in a cross-deck strip), consideration may be given by the Surveyor to allow an appropriate temporary repair to restore watertight or weather tight integrity after evaluation of the surrounding structure and impose an associated Condition of Class in accordance with IACS PR No.35(Procedure for Imposing and Clearing Condition of Class), with a specific time limit in order to complete the permanent repair and retain classification. *(2020)*

**6. Voyage repairs and maintenance**

(1) Where repairs to hull, machinery or equipment, which affect or may affect classification, are to be carried out by a riding crew during a voyage, they are to be planned in advance. A complete repair procedure including the extent of proposed repair and the need for Surveyor's attendance during the voyage is to be submitted to the Society in advance and the repair procedure is to be in accordance with the separate requirement specified by the Society.

Where in any emergency circumstance, emergency repairs are to be effected immediately, the repairs should be documented in the ship's log and submitted thereafter to the Society for use in determining further survey requirements. *(2021)*

Note : "emergency circumstance" means the circumstance which affect or may affect the ships maneuvering, survival, marine pollution or protection of the cargoes directly.

(2) The above is not intended to include maintenance and overhaul to hull, machinery and equipment in accordance with manufacturer's recommended procedures and established marine practice and which does not require the approval of the Society. However, any repairs as a result of such maintenance and overhauls which affects or may affect classification is to be noted in the ship's log and submitted to the attending Surveyor for use in determining further survey requirements.

## 109. Wear limit on structural members *(2021)*

When the thickness of hull structural members or the scantlings of equipment, etc. exceed the wear limit, they have to be renewed with those having the original scantlings or the scantlings "considered suitable" by the Society. However, when the original scantlings were larger than the required ones, or when "deemed appropriate by the Society", these requirements may be modified taking into account of the location, extent, kind of the wear.

Note : The terms "considered suitable" or "deemed appropriate by the Society" mean to comply with the requirements specified in the Classification Technical Rules such as **Pt 2** and **Pt 3** etc. of the Rules.

## 110. Survey planning meeting and safety meetings *(2018)*

**1.** The establishment of proper preparation and close co-operation between the attending Surveyor(s) and the Owner's representatives onboard prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings are to be held regularly.

**2.** Prior to the commencement of any part of the Special, Intermediate and Annual Survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, the thickness measurement firm operator/other service suppliers(as applicable) and the master of the ship or an appropriately qualified representative appointed by the master or company for the purpose to ascertain that all the arrangements envisaged in the survey programme(ESP Vessel only) or regarding the related surveys are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out. *(2021)*

Note : "an appropriately qualified representative" means a ship's officer.

**3.** The following is an indicative list of items that are to be addressed in the meeting.

(A) schedule of the vessel(i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.)

(B) confirm vessel's preparation to fulfill survey condition for the related surveys.
(C) hear from the shipmaster of the general conditions of the ship regarding the hull, machinery and equipment
(D Survey progress scheme, survey requirement and if necessary, survey items attending stages are discussed
(E) Regarding thickness measurement (if applicable)
  (a) provisions and arrangements for thickness measurements (i.e. access, cleaning/de-scaling, illumination, ventilation, personal safety)
  (b) extends of thickness measurements
  (c) acceptance criteria
  (d) extent of Close-up Survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion
  (e) execution of thickness measurements
  (f) taking representative readings in general and where uneven corrosion/pitting is found
  (g) mapping of areas of substantial corrosion
  (h) communication between attending Surveyor(s) the thickness measurement firm operator(s) and Owner representative(s) concerning findings *(2019)*

(F) other necessary items

## 111. Procedures for thickness measurements *(2021)* [See Guidance]

1. The required thickness measurements, if not carried out by the Society itself, are to be witnessed by a Surveyor. The Surveyor is to be on board to the extent necessary to control the process. In this case, the control of thickness measurement process is to be in accordance with **Annex 1-5** of the Guidance.

2. Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required. Thickness measurements are to be carried out by a firm approved by the Society in accordance with **Guidance for Approval of Service Suppliers,** except that in respect of measurements on non-ESP ships less than 500 gross tonnage and all fishing vessels, the firm need not be so approved. *(2019)*

3. **Thickness measurements and Close-up Surveys**
In any kind of survey, i.e. Special, Intermediate, Annual or other Surveys having the scope of the foregoing ones, thickness measurements, when required by **Table 1.2.9**, **Table 1.2.11**, **Table 1.3.2**, **Table 1.3.5**, **Table 1.3.8**, **Table 1.3.11** or **Table 1.3.14** of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys. *(2019)*

Consideration may be given by the attending Surveyor to allow use of Remote Inspection Techniques (RIT) as an alternative to close-up survey. Surveys conducted using a RIT are to be completed to the satisfaction of the attending Surveyor. *(2017)*

When RIT is used for a close-up survey, temporary means of access for the corresponding thickness measurements as specified in **Table 1.2.9**, **Table 1.2.11**, **Table 1.3.2**, **Table 1.3.5**, **Table 1.3.8**, **Table 1.3.11** or **Table 1.3.14** is to be provided unless such RIT is also able to carry out the required thickness measurements. *(2019)*

Where the ship has been constructed with FRP, aluminum alloy, stainless steel(except for clad steel plating) or other anti-corrosion materials, the thickness measurements for hull structure members and pipes may be dispensed with. *(2022)*

4. In all cases the extent of the thickness measurements is to be sufficient as to represent the actual average condition.

5. A thickness measurement report is to be prepared. The report is to give the location of measurements, the thickness measured as well as corresponding original thickness. Furthermore, the report is to give the date when the measurement was carried out, type of measuring equipment, names of personnel and their qualifications and has to be signed by the operator. The thickness measurement report is to follow the principles as specified in **Annex 1-5** of the Guidance.

6. The Surveyor is to review the final thickness measurements report and countersign the cover page.

## 112. Thickness measurements Acceptance Criteria *(2024)*

The acceptance criteria for thickness measurements are according to **Annex 1-5, Table 1** and/or specific IACS URs depending on ship's age and structural elements concerned, e.g. UR S21(UR S21 Rev.6 applies for ships contracted for construction on or after 1 July 2024) or UR S21A(UR S21A applies for ships contracted for construction on or after 1 July 2012, Rev.1 of UR S21A applies for ships contracted for construction on or after 1 July 2016. UR S21A was withdrawn from 1 July 2024 and replaced by UR S21 Rev.6) for all cargo hatch covers and coamings on exposed decks

## 113. Remote Inspection Techniques (RIT) *(2019)*

1. The RIT is to provide the information normally obtained from a close-up survey. RIT surveys are to be carried out in accordance with the requirements given here-in, the requirements of IACS Recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys' and **Guidance for Remote Inspection Techniques**.

These considerations are to be included in the proposals for use of a RIT which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Society. *(2021)*

2. The equipment and procedure for observing and reporting the survey using a RIT are to be discussed and agreed with the parties involved prior to the RIT survey, and suitable time is to be allowed to set-up, calibrate and test all equipment beforehand.

3. When using a RIT as an alternative to close-up survey, if not carried out by the Society itself, it is to be conducted by a firm approved as a service supplier according to **Guidance for Approval of Service Suppliers** and is to be witnessed by an attending surveyor of the Society.

4. The structure to be examined using a RIT is to be sufficiently clean to permit meaningful examination. Visibility is to be sufficient to allow for a meaningful examination. The Society is to be satisfied with the methods of orientation on the structure.

5. The Surveyor is to be satisfied with the method of data presentation including pictorial representation, and a good two-way communication between the Surveyor and RIT operator is to be provided.

6. If the RIT reveals damage or deterioration that requires attention, the Surveyor may require traditional survey to be undertaken without the use of a RIT.

## 114. In case of Dual Classed Vessel *(2021)*

1. Each Society acts on behalf of the other Society in accordance with the bilateral agreement adopted by the two Societies. This agreement shall clearly define the scope of work of each Society. *(2021)*

2. Each Society is to review whether the work undertaken by other Society on its behalf has been completed as agreed. *(2021)*

3. The procedures for maintaining(periodical surveys etc.) dual classed vessel are prescribed in the separate Instruction.

4. Even though a Dual Classed Vessel that does not have a written agreement with other Society is treated as Double Classed Vessel.

## 115. Preparations for survey

### 1. Conditions for survey

(1) The Owner is to provide the necessary facilities for a safe execution of the survey.

(2) Tanks and spaces are to be safe for access, i.e. safe measured such as gas freed, ventilated, and illuminated.

(3) In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces are to be cleaned including removal from surfaces of all loose accumulated corrosion scale. Spaces are to be sufficiently clean and free from water, scale, dirt, oil residues etc. to reveal corrosion, deformation, fractures, damages, or other structural deterioration. 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) Sufficient illumination is to be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration.

(5) Where soft or semi-hard coatings have been applied, safe access is to 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 or semi-hard coating is to be removed.

(6) Casings, ceilings or linings, and loose insulation, where fitted, are to be removed, as required by the Surveyor, for examination of plating and framing. Compositions on plating are to be examined and sounded, but need not be disturbed if found adhering satisfactorily to the plating. *(2023)*

Note :
The Surveyor is to consider the following items and so on when require to remove casings, ceilings or linings, and loose insulation.

A) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
B) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
C) where wastage is evident or suspect
D) where considered to be prone to rapid wastage

(7) In refrigerated cargo spaces the condition of the coating behind the insulation is to be examined 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". The condition of the coating is to be reported. If indents, scratches, etc., are detected during surveys of shell plating from the outside, insulations in way are to be removed as required by the Surveyor, for further examination of the plating and adjacent frames. *(2023)*

Note :

A) The term "to be extended as deemed necessary by the Surveyor" means the extent of insulations to determine the extent of the poor coating condition behind the insulation.

B) The Surveyor is to consider the following items and so on when require to remove casings, ceilings or linings, and loose insulation. *(2023)*

a) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
b) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
c) where wastage is evident or suspect
d) where considered to be prone to rapid wastage

**2. Access to structures**

(1) For survey, means are to be provided to enable the Surveyor to examine the hull structure in a safe and practical way.

(2) For survey in cargo holds and ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

(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
(E) other equivalent means

(3) For Surveys conducted by use of a remote inspection technique, one or more of the following means for access, acceptable to the Surveyor, is to be provided: *(2019)*

(A) Unmanned robot arm
(B) Remotely Operated Vehicles(ROV)
(C) Unmanned Aerial Vehicles / Drones
(D) Other means acceptable to the Society.

**3. Equipment for survey *(2023)***

(1) One or more of the following fracture detection procedures may be required if "deemed necessary by the Surveyor" :
(A) radiographic equipment
(B) ultrasonic equipment
(C) magnetic particle equipment
(D) dye penetrant

Note : The term"deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 2** of the Guidance.

**4. Survey[1] at sea or at anchorage *(2020)***

(1) Survey at sea or at anchorage may be accepted provided the Surveyor is given the necessary assistance from the personnel onboard. Necessary precautions and procedures for carrying out the survey are to be in accordance with **Par 1, Par 2** and **Par 3** above.

(2) A communication system is to be arranged between the survey party in the tank or space and the responsible officer on deck. This system is to also include the personnel in charge of ballast pump handling if boats or rafts are used.

(3) When boats or rafts are used, appropriate life jackets are to be available for all participants. Boats or rafts are to have satisfactory residual buoyancy and stability even if one chamber is ruptured. A safety check-list is to be provided.

(4) Surveys of tanks by means of boats or rafts may only be undertaken at the sole discretion of the Surveyor, who is to take into account the safety arrangements provided, including weather forecasting and ship response under foreseeable conditions. *(2023)*

(Note) [1] : Reference is made to IACS Recommendation 39 - "Safe Use of Rafts or Boats for Survey" *(2020)*

2) The term "at the sole discretion of the Surveyor" means the cases as specified in **Ch 3, 102. 6** (3) of the Rules. *(2023)*

## 116. Special consideration for military vessels *(2019)*

Special consideration may be given in application of relevant sections of this chapter to commercial vessels owned or chartered by Governments, which are utilized in support of military operations or service.

## 117. Internal examination for ballast tanks with semi-hard coating *(2019)*

As for the requirements regarding semi-hard coatings, these coatings, if already applied, will not be accepted form the next Special or Intermediate Survey commenced on or after 1 July 2010, whichever comes first, with respect to waving the annual internal examination of the ballast tanks.

# Section 2 Annual Survey

## 201. Due range

**1.** Annual Survey is to be carried out within 3 months before or after each anniversary date.

**2.** Annual Survey may be carried out in advance even if it is not due, upon application by the Owner. However, if Annual Survey is carried out more than 3 months earlier than the anniversary date, the anniversary date will be newly assigned to the date of 3 months later than the date on which the survey was completed. *(2023)*

**3.** A survey planning meeting is to be held prior to the commencement of the survey. *(2018)*

## 202. Hull, equipment and fire-extinguishing appliances

**1.** The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, hatch covers, hatch coamings, closing appliances, equipment and related piping are maintained in a satisfactory condition.

(1) Examination of weather decks, ship side plating above waterline, hatch covers and coamings.

(a) Confirmation is to be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

(b) Where mechanically operated steel covers are fitted, checking the satisfactory condition, as applicable, of:
(i) hatch covers
(ii) tightness devices of longitudinal, transverse and intermediate cross junctions(gaskets, gaskets lips, compression bars, drainage channels)
(iii) clamping devices, retaining bars, cleating, chain or rope pulleys
(iv) guides, guide rails and track wheels, stoppers, etc.
(v) wires, chains, gypsies, tensioning devices
(vi) hydraulic system essential to closing and securing
(vii) safety locks and retaining devices

(c) Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition where applicable, of:
(i) wooden covers and portable beams, carriers or sockets for the portable beams, and their securing devices
(ii) steel pontoons, tarpaulins
(iii) cleats, battens and wedges
(iv) hatch securing bars and their securing devices
(v) loading pads/bars and the side plate edge
(vi) guide plates and chocks
(vii) compression bars, drainage channels and drain pipes(if any)

(d) Checking the satisfactory condition of hatch coamings plating and their stiffeners, where applicable.

(e) Random checking of the satisfactory operation of mechanically operated hatch covers is to be made including:
(i) stowage and securing in open condition
(ii) proper fit and efficiency of sealing in closed condition
(iii) operational testing of hydraulic and power components, wires, chains and link drives

(f) Examination of the weld connection between air pipes and deck plating.
(g) External examination of all air pipe heads installed on the exposed decks.
(h) Examination of flame screens on the open ends of air pipes to all bunker tanks.

(2) Checking that no alterations have been made to the hull or superstructures that would affect the calculations determining the position of the load lines.

(3) Checking of the positions of the deck line and load line which, if necessary, are to be remarked and re-painted.

(4) Examining the means of securing the weathertightness of cargo hatchways, other hatchways and other openings on the freeboard and superstructure decks.

(5) Examining the watertight integrity of the closures to any openings in the ship's side below the freeboard deck.

(6) Examining the ventilators and air pipes, including their coamings and closing appliances.
(7) Examining the scuppers, inlets and discharges.
(8) Examining the garbage chutes.
(9) Examining the means provided to minimize water ingress through the spurling pipes and chain lockers.

(10) Examining the side scuttles and deadlights.
(11) Examining the bulwarks including the provision of freeing ports, special attention being given to any freeing ports fitted with shutters.

(12) Examining the guardrails, gangways, walkways and other means provided for the protection of the crew and for gaining access to and from crew's quarters and working spaces.

(13) Checking, when applicable, the fittings and appliances for timber cargoes on deck.
(14)
(A) Confirming that the drainage from enclosed cargo spaces situated on the freeboard deck is satisfactory.

(B) Examining visually the drainage facilities for blockage or other damage and confirming the provision of means to prevent blockage of drainage arrangements, for closed vehicle and ro-ro spaces and special category spaces where fixed pressure water-spraying systems are used (SOLAS 08, Reg.II-2/20.6.1.5).

(15) Examining engine room and boiler room including exposed engine casings and their openings, engine room skylights, ventilator openings and their closing appliances.

(16) Examining flush scuttles and manhole covers.
(17) General condition of outside of the hull above the water line including weather deck and the arrangement for drainage, mooring and anchoring(including the hull structures in the vicinity of the fittings) are to be examined so far as could be seen.

For ships built after 1 January 2007 subject to the *International Convention for the Safety of Life at Sea(SOLAS)*, confirming that the towing and mooring equipment is clearly and properly marked with any restriction associated with its safe operation.

(18) Examining the superstructure end bulkheads, and examining the collision and the other watertight bulkheads as far as can be seen.

(19) Examining and testing(locally and remotely) all the watertight doors in watertight bulkheads.

(20) Examining penetrations and stop valves on watertight bulkheads and closing appliances of openings on superstructure end bulkheads. If "considered necessary by the Surveyor", performance test for closing appliances of openings on superstructure end bulkheads is to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(21) Examining, when applicable, the special requirements for ships permitted to sail with reduced freeboard.

(22) Checking the ballasting arrangements (SOLAS 74/06/17 Reg.II-1/20) *(2023)*
(23) Examining each bilge pump and confirming that the bilge pumping system for each watertight compartment is satisfactory.

(24) Confirming, when appropriate and as far as is practicable when examining internal spaces on oil tankers and bulk carriers, that the means of access to cargo and other spaces remain in good condition (SOLAS 74/00/02, Reg.II-1/3-6).

(25) Examining the functionality of bilge well alarms to all cargo holds and conveyor tunnels (SOLAS 74/97/04, Reg.XII/9).

(26) For bulk carriers, examining the hold, ballast and dry space water level detectors and their audible and visual alarms (SOLAS 74/02, Reg.XII/12).

(27) For bulk carriers, checking the arrangements for availability of draining and pumping systems forward of the collision bulkhead (SOLAS 74/02, Reg.XII/13).

(28) For container ships equipped with container securing arrangements in accordance with **Pt 7, Ch 4, 1003.** of the Rules, the container securing arrangements are to be examined as follows:
(a) general examination for arrangements
(b) confirmation of on-board record book

(29) For container ships provided with container lashing calculation program and instrument approved by the Society in accordance with the requirements of **Guidance Pt 7, Annex 7-2** and assigned "CL" as Special Feature Notations, it is to be confirmed that the container lashing calculation program and the instrument having the performance and functions as deemed appropriate by the Society is installed on board. *(2023)*

(30) For ships provided with a loading instrument on longitudinal strength in accordance with the requirements of **Pt 3, Ch 3, 104.,** the fallowing items are to be confirmed. *(2025)*

(A) It is to be checked that the approved loading manual is available onboard.

(B) The loading instrument is to be checked for accuracy at regular intervals by the ship's master by applying test loading conditions.

(31) For ships provided with a loading instrument on stability in accordance with the requirements of **Ch 1, 307.,** the following items are to be confirmed. *(2025)*

(A) It is the responsibility of the ship's master to check the accuracy of the onboard computer for stability calculations by applying at least one approved test condition. If a Surveyor is not present for the computer check, a copy of the test condition results obtained by the computer check is to be retained on board as documentation of satisfactory testing for the Surveyor's verification.

(B) The testing procedure shall be carried out in accordance with **Annex 1-10** Loading Instrument on Stability, 3. (9).

(32) Documentations on board including the stability data, etc. approved by the Society are to be confirmed to be kept on board.

(33) Examining the fire protection arrangements in cargo, vehicle and ro-ro spaces, including fire safety arrangements in accordance with **Pt 8, Ch 13, Sec 6** of the Rules for vehicle carriers carrying motor vehicles with compressed hydrogen or natural gas in their tanks for their own propulsion as cargo, as applicable, and confirming, as far as practicable and as appropriate, the operation of the means of control provided for closing the various openings *(2020)*

(34) Suspect areas *(2017)*
Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

However, the substantial corrosion areas identified on bulk carriers built under IACS Common Structural Rules(**Pt 11** or **Pt 13**) are to be in accordance with **Ch 3, 202. 5, 203. 4** (c), **204. 5** (2) in case of single skin bulk carriers or **Ch 3, 602. 5, 603. 4** (c), **604. 5** (2) in case of double skin bulk carriers.

Note : These requirements are not applicable to cargo tanks of oil tankers, chemical tankers and double hull oil tankers, surveyed in accordance with **Ch 3, Sec 3, Sec 4** and **Sec 5.**

(35) Examination of ballast tanks *(2023)*
Examination of ballast tank when required as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When "considered necessary by the Surveyor", or

where extensive corrosion exists, thickness measurement is to be carried out.

If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increase to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(36) Examining, for bulk carriers of 150 m and above, where applicable, the ship's structure in accordance with the Ship Construction File, taking into account identified areas that need special attention, verifying that the Ship Construction File is updated, where applicable. (SOLAS 10, Reg.II-1/3-10 and MSC.287(87)). *(2024)*

(37) Surveys of Watertight Cable Transits *(2021)*

(A) Watertight cable transits are to be installed and maintained in accordance with the manufacturer's requirements and in accordance with the requirements of the relevant Type Approval certification.

(B) The owner is to maintain the Register to record any disruption (repair, modification or opening out and closing) to a cable transit or to record the installation of a new cable transit.

(C) Cable transits have been installed, and where disrupted have been reinstated, in accordance with the manufacturer's requirements and in accordance with the requirements of Type Approval.

(D) Where specified, appropriate specialized tools have been used.

(E) The Register is to be reviewed to confirm it is being maintained and as far as practicable the transits are to be examined to confirm their satisfactory condition.

(F) Where there are records entered since the last annual survey of any disruption to the cable transits or installation of new cable transits, the satisfactory condition of those transits is to be confirmed by review of records and, if deemed necessary, by examination. The results are to be recorded in the Register against the specific cable transit.

(38) Any penetration used for the passage of heat-sensitive piping systems through a watertight bulkhead or deck on a passenger ship *(2024)*

(A) Watertight piping penetrations are to be installed and maintained in accordance with the manufacturer's requirements and in accordance with the requirements of the relevant Type Approval certification.

(B) Watertight piping penetrations have been installed, and where disrupted have been reinstated, in accordance with the manufacturer's requirements and in accordance with the requirements of Type Approval.

(39) For ships provided with the equipment employed in the mooring of ships at single point mooring specified in **Pt 4, Ch 10, 101. 7** and assigned the additional class notation "EQ-SPM", the general function and deformation condition of this equipment employed in the mooring of ships at single point mooring and hull supporting structures are to be checked. *(2017)*

**2.** For fire-extinguishing appliances, the survey is to be in accordance with the Guidance relating to the Rules. **【See Guidance】**

**3.** For ships subject to the enhanced survey programme such as **bulk carriers, oil tankers** and **chemical tankers**, etc., in addition to items of **Par 1** through **Par 2**, the additional requirements in accordance with **Ch 3** are to be taken. However, if the duplicated survey items are exist, these are not to be applied twice.

4. For additional requirements applicable to water level detectors fitted on single hold cargo ships, refer **Sec 15**.

5. In addition to **Par 1** through **Par 2, Ch 15** is also to be taken for general dry cargo ships and **Ch 16** is also to be taken for liquefied gas carriers. However, if the duplicated survey items are exist, these are not to be applied twice.

6. In addition to **Par 1** through **Par 2, Ch 17** is also to be taken for shell and inner doors, etc. of RoRo ships. However, if the duplicated survey items are exist, these are not to be applied twice.

7. In addition to **Par 1** through **Par 2**, relevant requirements of **Ch 18** and/or **Ch 19** are also to be taken if applicable.

### 203. Machinery, electrical installations and additional installations

1. Confirming that the machinery, boilers and other pressure vessels, associated piping systems and fittings are installed and protected so as to reduce to a minimum any danger to persons on board, due regard being given to moving parts, hot surfaces and other hazards.

2. Confirming that the normal operation of the propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative.

3. Confirming that means are provided so that the machinery can be brought into operation from the dead ship condition without external aid.

4. Carrying out a general examination of the machinery, the boilers, all steam, hydraulic, pneumatic and other systems and their associated fittings to see whether they are being properly maintained and with particular attention to the fire and explosion hazards.

5. Examining and testing the operation of main and auxiliary steering arrangements, including their associated equipment and control system.

6. Confirming that the means of communication between the navigating bridge and the steering gear compartment and the means of indicating the angular position of the rudder are operating satisfactorily.

7. Confirming that with ships having emergency steering positions there are means of relaying heading information and, when appropriate, supply visual compass reading to the emergency steering position.

8. Confirming that various alarms required for hydraulic power-operated, electric and electro-hydraulic steering gears are operating satisfactorily and that the re-charging arrangements for hydraulic power-operated steering gears are being maintained.

9. Examining the means for the operation of the main and auxiliary machinery essential for propulsion and the safety of the ship, including, when applicable, the means of remotely controlling the propulsion machinery from the navigating bridge(including the control, monitoring, reporting, alert and safety actions) and the arrangements to operate the main and other machinery from a machinery control room.

10. Confirming the operation of the ventilation for the machinery spaces.

11. Confirming that the engine room telegraph, the second means of communication between the navigating bridge and the machinery space and the means of communication with any other positions from which the engines are controlled are operating satisfactorily.

12. Confirming that the engineer's alarm is clearly audible in the engineer's accommodation.

13. Examining, as far as practicable, visually and in operation, the electrical installations, including the main source of power and the lighting systems.

14. Confirming, as far as practicable, the operation of the emergency sources of electrical power including their staring arrangements, the systems supplied and, when appropriate, their automatic operation.

15. Examining, in general, that the precautions provided against shock, fire and other hazards of electrical origin are being maintained.

**16.** Examining, where applicable, the alternative design and arrangements for machinery or electrical installations, or fire safety, in accordance with the test, inspection and maintenance requirements, if any, specified in the approved documentation.

**17.** Confirming, as far as practicable, that no changes have been made in the structural fire protection, examining any manual and automatic fire doors and proving their operation, testing the means of closing the main inlets and outlets of all ventilation systems and testing the means of stopping power ventilation systems from outside the space served.

**18.** Confirming that the means of escape from accommodation, machinery and other spaces are satisfactory.

**19.** Examining the arrangements for gaseous fuel for domestic purpose.

**20.** Examining visually the condition of any expansion joints in sea water systems.

**21.** External survey of boilers and thermal oil heaters including test of safety and protective devices, and test of safety valve using its relieving gear, is to be carried out. For exhaust gas economizers, the safety valves are to be tested by the Chief Engineer at sea within the Annual Survey. This test is to be recorded in the log book for review by the attending Surveyor prior to crediting the Annual Survey.

**22.** Examination for the pressure relief devices of the refrigerating machinery given in **Pt 5, Ch 6, Sec 12** is to be carried out. Where the test results done by ship's crew are considered satisfactory by the Surveyor, the test may be dispensed with. **【See Guidance】**

**23.** The surveys for water jet propulsion systems and azimuth or rotatable thruster are to be carried out in accordance with the **Annex 1-9** of the Guidance. *(2021)*

**24.** The surveys for additional installations(cargo refrigerating installations, cargo handling appliances, automation and remote control systems, dynamic positioning system, navigation bridge systems, hull monitoring systems, diving system, high voltage shore connection systems, cargo vapour emission control systems and ballast water management, etc.) are to be carried out in accordance with the requirements specified in Pt 9, etc.

**25.** Gas-fuelled ships other than ships carrying liquefied gases in bulk and ships carrying CNG in bulk are also to meet with the requirements in **Ch 4, 301. of the Rules/Guidance for the Classification of Ships Using Low-flashpoint Fuels**, in addition to the requirements in this section.

**26.** Where considered necessary by the Surveyor, opening up examination of the above items may be requested. **【See Guidance】**

**27.** Where harmonic filters are installed on main busbars of electrical distribution system, other than those installed for single application frequency drives such as pump motors, confirming the measurement records for harmonic distortion levels experienced on the main busbar. *(2020)* **【See Guidance】**

**28.** The Surveys for Exhaust gas emission abatement system(SCR, EGR & EGCS) are to be carried out in accordance with **Guidance for Prevention System of Pollution from Ships** *(2022)*

**29.** In addition to **Par 1** through **Par 28** relevant requirements of **Ch 19** are also to be taken if applicable. *(2021)*

**30.** For the survey for towing winch emergency release system which is specified in **Pt 7, Ch 9, Sec 8,** the following requirements are to be complied with. *(2021)*

(1) Operation of the towing winch emergency release system is to be confirmed with the reference to the documented instructions for surveys provided by the manufacturer. Operation of the winch emergency release system under no load condition is to be verified. Where practical, activation of the emergency release system may be confirmed by observation of the winch brake.

(2) The function of the alarms associated with the emergency release system is to be verified, as far as practicable and reasonable.

(3) The condition of the emergency release system is to be visually examined to confirm it remains in satisfactory condition.

(4) The means of emergency release of the towline in the event of a blackout is to be examined, and where additional sources of energy are arranged for this purpose, the sources of energy are

to be visually inspected and operationally tested.

(5) It is to be verified that the performance capabilities and operating instructions of the emergency release system are documented and made available on board the ship on which the winch has been installed.

## 204. Additional requirements to ship types

### 1. Oil tankers(including tankers) : *(2023)*

The additional requirements are to apply to Annual Survey as follows, as far as practicable. Where "considered necessary by the Surveyor", the performance test and overhauling may be required.

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(1) Checking the deck foam system, including the supplies of foam concentrate and testing that the minimum required number of jets of water at the required pressure in the fire main is obtained when the system is in operation.

(2) Examining the inert gas system, and in particular:
(A) Examining externally for any sign of gas or effluent leakage.
(B) Confirming the proper operation of both inert gas blowers.
(C) Observing the operation of the scrubber room ventilation system.
(D) Non-return devices as the followings; *(2020)*

(a) examining externally deck seals and checking the deck seal for automatic filling and draining, and the arrangements for protecting the system against freezing;

(b) where a double block and bleed valve is installed, checking the automatic operations of the block and the bleed valves upon loss of power;

(c) where two shut-off valves in series with a venting valve in between are used as non-return devices, checking the automatic operation of the venting valve, and the alarm for faulty operation of the valves;

(E) Examining the operation of all remotely operated or automatically controlled valves and, in particular, the flue gas isolating valves.

(F) Observing a test of the interlocking feature of soot blowers.
(G) Observing that the gas pressure regulating valve automatically closes when the inert gas blowers are secured.

(H) Checking, as far as practicable, the following alarms and safety devices of the inert gas system using simulated condition "where necessary". *(2023)*
(a) high oxygen content of gas in the inert gas main.
(b) low gas pressure in the inert gas main.
(c) low pressure in the supply to the deck water seal.
(d) high temperature of gas in the inert gas main.
(e) low water pressure or low water-flow rate.
(f) accuracy of portable and fixed oxygen-measuring equipment by means of calibration gas.
(g) high water level in the scrubber.
(h) failure of the inert gas blower.
(i) failure of the power supply to the automatic control system for the gas regulating valve and to the instrumentation for continuous indication and permanent recording of pressure and oxygen content in the inert gas main.

(j) high pressure of gas in the inert gas main.

Note : The term "where necessary" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(I) Checking the means for separating the cargo tank not being inerted from the inert gas main; *(2020)*
(J) Checking the alarms of the two oxygen sensors positioned in the space or spaces containing the inert gas system; *(2020)*

(3) Checking, when practicable, the proper operation of the inert gas system on completion of the checks listed above. And then the inert gas systems using stored carbon dioxide, oil fuel combustion type systems, etc. except those using flue gases, are to be tested to ascertain that they are in good working order.

(4) Examining the fixed fire-fighting system for cargo pump rooms, and confirming, as far as practicable, the operation of the remote means for closing the various openings.

(5) Checking for all tankers, the provision of at least one portable instrument for measuring oxygen and one for measuring flammable vapour concentrations, together with a sufficient set of spares, and suitable means for the calibration of these instruments. (SOLAS 10 Reg.II-2/4.5.7.1)

(6) Examining the arrangements for gas measurement in double-hull spaces and double bottom spaces, including the fitting of permanent gas sampling lines, where appropriate. (SOLAS 10 Reg.II-2/4.5.7.2)

(7) Examining, as far as possible, and testing the fixed hydrocarbon gas detection system in double-hull and double-bottom spaces. (SOLAS 10 Reg.II-2/4.5.7.3 and FSSC Ch.16) *(2022)*

(8) Checking protection of cargo pump room and in particular:
(A) Checking temperature sensing devices for bulkhead gland and alarms.
(B) Checking interlock between lighting and ventilation.
(C) Checking gas detection system.
(D) Checking bilge level monitoring devices and alarms.

(9) Confirming, when appropriate, that the requisite arrangements to regain steering capability in the event of the prescribed single failure are being maintained.

(10) Examining the cargo tank openings, including gaskets, covers, coamings and screens.

(11) Examining the cargo tank pressure/vacuum valves and devices to prevent the passage of flame.

(12) Examining the devices to prevent the passage of flame on vents to all bunker, oily-ballast and oily-slop tanks and void spaces, as far as practicable. *(2024)*

(13) Examining the cargo tank venting, cargo tank purging and gas-freeing and other ventilation systems.

(14) Examining the cargo, crude oil washing, ballast and stripping systems both on deck and in the cargo pump-rooms and the bunker system on deck.

(15) Confirming that all electrical equipment in dangerous zones is suitable for such locations, is in good condition and is being properly maintained.

(16) Confirming that potential sources of ignition in or near the cargo pump-room are eliminated, such as loose gear, combustible materials, etc., that there are no signs of undue leakage and that access ladders are in good condition.

(17) Examining all pump-room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of cargo pump-room bulkheads.

(18) Examining, as far as practicable, the cargo, bilge, ballast and stripping pumps for undue gland seal leakage. Verifying the proper operation of electrical and mechanical remote operating and shutdown devices and operation of cargo pump-room bilge system, and checking that pump foundations are intact.

(19) Confirming that the pump-room ventilation system is operational, ducting is intact, dampers are operational and screens are clean.

(20) Verifying that installed pressure gauges on cargo discharge lines and level indicator systems are operational.

(21) Examining access to bow arrangement.

(22) Examining the towing arrangement for tankers of not less than 20,000 tonnes deadweight.

(23) Examining the emergency lighting in all cargo pump rooms of tanker constructed after 1 July 2002.

(24) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

(25) Confirming that the corrosion prevention system fitted to dedicated ballast water tanks when appropriate is maintained. (SOLAS 74/00 Reg.II-1/3-2)

(26) Confirming that the coating system in cargo oil tanks of crude oil tankers, when appropriate, is maintained and that in-service maintenance and repair activities are recorded in the coating technical file.

(27) Examining, for oil tankers of 150 m in length and above, where appropriate, the ship's structure in accordance with the Ship Construction File, taking into account identified areas that need special attention, verifying that the Ship Construction File is updated, where applicable. (SOLAS 10, Reg.II-1/3-10 and MSC.287(87)). *(2024)*

## 2. Chemical tankers *(2023)*

The additional requirements are to apply to Annual Survey as follows, as far as practicable. Where "considered necessary by the Surveyor", the performance test and overhauling may be required.

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(1) Confirming, when appropriate, that the requisite arrangements to regain steering capability in the event of the prescribed single failure are being maintained.

(2) Examining the cargo tank openings, including gaskets, covers, coamings and screens.
(3) Examining the cargo tank pressure/vacuum valves and devices to prevent the passage of flame.
(4) Examining the devices to prevent the passage of flame on vents to all bunker, oily-ballast and oily-slop tanks and void spaces, as far as practicable. *(2024)*
(5) Examining the cargo tank venting, cargo tank purging and gas-freeing and other ventilation systems.

(6) Examining the cargo, tank cleaning, ballast and stripping systems both on deck and in the cargo pump-rooms and the bunker system on deck.

(7) Examining, as far as practicable, the cargo, bilge, ballast and stripping pumps for undue gland seal leakage. Verification of the proper operation of electrical and mechanical remote operating and shutdown devices and operation of cargo pump-room bilge system, and checking that pump foundations are intact.

(8) Confirming that the pump-room ventilation system is operational, ducting is intact, dampers are operational and screens are clean.
(9) Verifying that installed pressure gauges on cargo discharge lines and level indicator systems are operational.

(10) Confirming that wheelhouse doors and windows, sidescuttles and windows in superstructure and deckhouse ends facing the cargo area are in a satisfactory condition.

(11) Confirming that potential sources of ignition in or near the cargo pump-room are eliminated, such as loose gear, combustible materials, etc., that there are no signs of undue leakage and that access ladders are in good condition.

(12) Confirming that removable pipe lengths or other approved equipment necessary for cargo separation are available in the pump room and are in a satisfactory condition.

(13) Examining all pump room bulkhead for signs of cargo leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room bulkheads.

(14) Confirming that the remote operation of cargo pump bilge system is satisfactory.
(15) Examining the bilge and ballast arrangements and confirming that pumps and pipelines are identified.

(16) Confirming, when applicable, that the bow or stern loading and unloading arrangements are in order and testing the means of communication and the remote shut down for the cargo pumps.

(17) Examining the cargo transfer arrangements and confirming that any hoses are suitable for their intended purpose and, where appropriate, type-approved or marked with date of testing.

(18) Examining, as far as practicable, the cargo heating or cooling systems, including any sampling arrangements, and confirming that the means for measuring the temperature and associated alarms are operating satisfactorily.

(19) Examining, as far as practicable, the cargo tank vent systems, including the pressure/vacuum valves and secondary means to prevent over or under pressure and flame screens and the arrangements of cargo tank purging with inert gas, as applicable. *(2020)*

(20) Examining the gauging devices, high-level alarms and valves associated with overflow control.

(21) Confirming that arrangements for sufficient gas to be carried or generated to compensate for normal losses and that the means provided for monitoring ullage spaces are satisfactory.

(22) Confirming that arrangements are made for sufficient medium to be carried where drying agents are used on air inlets to cargo tanks.

(23) Confirming that all electrical equipment in dangerous zones is suitable for such locations, is in satisfactory condition and has been properly maintained.

(24) Examining the fixed fire-fighting system for the cargo pump room and the deck foam system for the cargo area and confirming that their means of operation are clearly marked.

(25) Confirming that the condition of the portable fire extinguishing equipment for the cargoes to be carried in the cargo area is satisfactory.

(26) Examining, as far as practicable, and confirming the satisfactory operation of, the arrangements for the ventilation of spaces normally entered during cargo handling operations and other spaces in the cargo area.

(27) Examining, as far as practicable, that the intrinsically safe systems and circuits used for measurement, monitoring, control and communication purposes in all hazardous locations are being properly maintained.

(28) Examining the equipment for personal protection and in particular that:

(A) the protective clothing for crew engaged in loading and discharging operation and its stowage is in a satisfactory condition;

(B) the required safety equipment and associated breathing apparatus and associated air supplies and, when appropriate, emergency-escape respiratory and eye protection are in a satisfactory condition and are properly stowed;

(C) medical first-aid equipment, including stretchers and oxygen resuscitation equipment are in a satisfactory condition;

(D) arrangements have been made for the antidotes for the cargoes actually carried to be on board;

(E) decontamination arrangements and eyewashes are operational;

(F) the required gas detection instruction are on board and that arrangements have been made for the supply of the appropriate vapour detection tubes;

(G) the arrangements for the stowage of cargo samples are satisfactory;

(29) Confirming that the system for continuous monitoring of the concentration of flammable vapours is satisfactory. And, confirming that sampling points or detector heads are located in suitable positions in order that potentially dangerous leakages are readily detected. *(2024)*

(30) Examining externally and confirming that the pumping and piping systems, including a stripping system if fitted, and associated equipment remain as approved.

(31) Examining externally the tank washing piping and confirming that the type, capacity, number, and arrangement of the tank washing machine are as approved.

(32) Examining externally the wash water heating system.

(33) Examining externally, as far as practicable, the underwater discharge arrangements.

(34) Confirming that the means of controlling the rate of discharge of the residue is as approved.

(35) Confirming that the flow rate indicating device is operable.

(36) Confirming that the ventilation equipment for residue removal is as approved.

(37) Examining externally, as far as it is accessible, the heating system required for solidifying and high viscosity substances.

(38) Confirming that any cargo tank high-level alarms are operable.

(39) Examining any additional requirements for the carriage of cargoes listed on the relevant Certificate.

(40) Examining access to bow arrangement.
(41) Examining the towing arrangement for tankers of not less than 20,000 tonnes deadweight.
(42) Examining the emergency lighting in all cargo pump rooms of tanker constructed after 1 July 2002.
(43) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

(44) Confirming that the corrosion prevention system fitted to dedicated ballast water tanks when appropriate is maintained. (SOLAS 74/00 Reg.II-1/3-2)

### 3. Liquefied gas carriers *(2023)*

The additional requirements are to apply to Annual Survey as follows, as far as practicable, during a loading or discharging operation. Access for cargo tanks or inerted hold spaces, however, need not be surveyed unless otherwise specially required by the Surveyor. Where "considered necessary by the Surveyor", the performance test and overhauling may be required.

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(1) Confirming, when appropriate, that the requisite arrangements to regain steering capability in the event of the prescribed single failure are being maintained.

(2) Examining the cargo tank openings, including gaskets, covers, coamings and screens.
(3) Examining the devices to prevent the passage of flame on vents to all bunker, oily-ballast tanks and void spaces, as far as practicable. *(2024)*

(4) Examining the cargo tank venting, cargo tank purging and gas-freeing and other ventilation systems.
(5) Examining the cargo, ballast and stripping systems both on deck and in the cargo compressor rooms and the bunker system on deck. *(2024)*

(6) Confirming that all electrical equipment in dangerous zones is suitable for such locations, is in good condition and has been properly maintained.
(7) Confirming that potential sources of ignition in or near the cargo compressor-room are eliminated, such as loose gear, combustible materials, etc., that there are no signs of undue leakage and that access ladders are in good condition.

(8) Examining all cargo compressor-room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of cargo compressor-room bulkheads.

(9) Confirming that ventilation systems for the compressor-room and the electric motor room are operational in the proper direction, ducting is intact, dampers are operational and screens are clean. *(2018)*

(10) Verifying that installed pressure gauges on cargo discharge lines and level indicator systems are operational.

(11) Confirming that special arrangements to survive conditions of damage are in order.
(12) Examining, where applicable, the alternative design and arrangements for the segregation of the cargo area, in accordance with the test, inspection and maintenance requirements, if any, specified in the approved documentation. *(2020)*

(13) Confirming that wheelhouse doors and windows, sidescuttles and windows in superstructure and deckhouse ends in the cargo area are in a satisfactory condition.

(14) Examining the cargo machinery spaces and turret compartments, including their escape routes. *(2020)*
(15) Confirming the manually operated emergency shutdown system together with the automatic shutdown of the cargo pumps and compressors are satisfactory.

(16) Examining the cargo control room.
(17) Examining the gas detection arrangements for cargo control rooms and the measures taken to exclude ignition sources where such spaces are classified as hazardous areas. *(2024)*

(18) Confirming the arrangements for the air locks are being properly maintained.
(19) Examining, as far as practicable, the bilge, ballast and oil fuel arrangements.
(20) Examining, when applicable, the bow or stern loading and unloading arrangements with particular reference to the electrical equipment, fire-fighting arrangements and means of communication between cargo control room and the shore location.

(21) Confirming that the sealing arrangements at gas domes are satisfactory
(22) Confirming that portable or fixed drip tray or deck insulation for cargo leakage is in order. *(2018)*
(23) Examining the cargo and process piping, including the expansion arrangements, insulation from the hull structure, pressure relief and drainage arrangements and water curtain protection as appropriate. *(2024)*

(24) Confirming that the cargo tank and interbarrier space pressure and relief valves, including safety systems and alarms, are satisfactory.

(25) Confirming that the any liquid and vapour hoses are suitable for their intended purpose and, where appropriate, type-approved or marked with date of testing.

(26) Examining the arrangements for the cargo pressure/temperature control including, when fitted, the thermal oxidation systems and any refrigeration system, and confirming that any associated safety measures and alarms are satisfactory. *(2024)*

(27) Examining the cargo, bunker, ballast and vent piping systems, including PRVs, vacuum relief valves, vent masts and protective screens, as far as practicable, and confirming that the PRVs are type-approved or marked with date of testing *(2021)*

(28) Confirming that arrangements are made for sufficient inert gas to be carried to compensate for normal losses and that means are provided for monitoring the spaces.

(29) Confirming that the use of inert gas has not increased beyond that needed to compensate for normal losses by examining records of inert gas usage.

(30) Confirming that any air-drying system and any interbarrier and hold space purging inert gas system are satisfactory.

(31) Confirming that electrical equipment in gas-dangerous spaces and zones is in a satisfactory condition and is being properly maintained.

(32) Examining the arrangements for the fire protection and fire extinction and testing the remote means of starting one main fire pump.

(33) Examining the fixed fire-fighting system for enclosed cargo machinery spaces and for the enclosed cargo motor room within the cargo area, and confirming that its means of operation is clearly marked. *(2024)*
(34) Examining the water spray system for cooling, fire protection and crew protection and confirming that its means of operation is clearly marked.

(35) Examining the dry chemical powder fire-extinguishing system for the cargo area and confirming that its means of operation is clearly marked.
(36) Examining the appropriate fire-extinguishing system for the enclosed cargo machinery spaces for ships that are dedicated to the carriage of a restricted number of cargoes and the internal water spray system for the turret compartments, and confirming that their means of operation is clearly marked. *(2023)*

(37) Examining, as far as practicable, and confirming the satisfactory operation of, the arrangements for the artificial ventilation of spaces in the cargo area normally entered during cargo handling operations. *(2024)*

(38) Examining, and confirming the satisfactory operation of, the arrangements for the mechanical ventilation of spaces normally entered other than those covered by (37) above. *(2024)*

(39) Examining, and testing as appropriate and as far as practicable, the liquid level indicators, overflow control, pressure gauges, high pressure and, when applicable, low pressure alarms, and temperature indicating devices for the cargo tanks.

(40) Examining, and testing as appropriate, the gas detection equipment.
(41) Confirming that two sets of portable gas detection equipment suitable for the cargoes to be carried and a suitable instrument for measuring oxygen levels have been provided.

(42) Checking the provision of equipment for personal protection and in particular that:
(A) two complete sets of safety equipment each permitting personnel to enter and work in a gas-filled space are provided and are properly stowed;

(B) the requisite supply of compressed air is provided and examining, when applicable, the arrangements for any special air compressor and low-pressure air line system.

(C) medical first-aid equipment, including stretchers and oxygen resusciation equipment and antidotes, when available, for the products to be carried are provided.

(D) respiratory and eye protection suitable for emergency escape purposes are provided.

(E) examining when applicable, the arrangements to protect personnel against the effects of major cargo release by a special suitably designed and equipped space within the accommodation area;

(F) examining, when applicable, the arrangements for the use of cargo as fuel and testing, as far as practicable, that the gas supply to the machinery space is cut off should the exhaust ventilation not be functioning correctly and that master gas fuel valve may be remotely closed from within the machinery space.

(43) The log books are to examined with regard to correct functioning of the cargo containment and cargo handling systems. The hours per day of the reliquefaction plants or the boil-off rate is to be considered.

(44) All accessible gas-tight bulkhead penetrations including gas-tight shaft sealings are to be visually examined.

(45) The means for accomplishing gas tightness of the wheelhouse doors and windows is to be examined. All windows and side scuttles within the area required to be of the fixed type (non-opening) are to be examined for gas tightness. the closing devices for all air intakes and openings into accommodation spaces, service spaces, machinery spaces, control stations and approved openings in superstructures and deckhouses facing the cargo area or bow and stern loading/unloading arrangements, are to be examined.

(46) Cargo handing systems

The cargo handling piping and machinery, e.g. cargo and process piping, cargo heat exchangers, vaporizers, pumps, compressors and cargo hoses are in general to be visually examined, as far as possible, during operation.

(47) Cargo containment venting systems

Venting systems, including protection screens if provided, for the cargo tanks, interbarrier spaces and hold spaces are to be visually examined externally. It is to be verified that the cargo tank relief valves are sealed and that the certificate for the relief valves opening/closing pressure is onboard.

(48) Instrumentation and safety systems

(A) The instrumentation of the cargo installations with regard to pressure, temperature and liquid level is to be verified in good working order by one or more of the following methods:
- Visual external examination
- Comparing of read outs from different indicators
- Consideration of read outs with regard to the actual cargo and/or actual condition
- Examination of maintenance records with reference to cargo plant instrumentation maintenance manual
- Verification of calibration status of the measuring instruments

(B) The logbooks are to be examined for confirmation that the emergency shutdown system has been tested.

(49) Environmental control for cargo containment systems

(A) Inert gas/ dry air installations including the means for prevention of backflow of cargo vapour to gas-safe spaces are to be verified as being in satisfactory operating condition.

(B) For membrane containment systems normal operation of the nitrogen control system for insulation and interbarrier spaces shall be confirmed to the Surveyor by the Master.

(50) Miscellaneous

(A) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

(B) Arrangements for burning methane boil-off are to be visually examined as far as practicable. The instrumentation and safety systems are to be verified as being in good working order in accordance with (47) (A) above.

(C) The relevant instruction and information material such as cargo handling plans, filling limit information, cooling down procedures etc. are to be verified as being onboard.

(D) Mechanical ventilation fans in gas dangerous spaces are to be visually examined.

(51) Examining access to bow arrangement.
(52) Examining the towing arrangement for tankers of not less than 20,000 tonnes deadweight.
(53) Examining the emergency lighting in all cargo pump rooms of tanker constructed after 1 July 2002.
(54) Confirming that the corrosion prevention system fitted to dedicated ballast water tanks when appropriate is maintained. (SOLAS 74/00 Reg.II-1/3-2)
(55) Examining the cargo tank pressure/vacuum valves and appropriate protective screens/devices to prevent the passage of flame. **【See Guidance】** *(2024)*

(56) Examining, as far as practicable, the cargo, bilge, ballast and stripping pumps for undue gland seal leakage, verification of proper operation of electrical and mechanical remote operating and shutdown devices and operation of cargo compressor-room bilge system, and checking that pump foundations are intact. *(2024)*

**4. Pushers and integrated pusher barges :**

The additional requirements for the connection system between pusher and integrated pusher barge are to apply to Annual Survey as follows.

(1) Confirmation of operating condition of connection system according to the operation procedure.
(2) Examination of connection condition including the supporting structures.
(3) Examination of hydraulic system for leak and operating condition, if fitted.
(4) Examination of hinge arm and joint pins, if fitted.
(5) Examination of mechanical locking/unlocking device including operating condition, if fitted.

# Section 3 Intermediate Survey

## 301. Due range

**1.** Intermediate Survey is to be carried out within 3 months before or after the second or third anniversary date from the completion date of the initial Classification Survey or of the previous Special Survey.

However, for passenger ships, submersibles, nuclear ships, high speed crafts* and WIG Craft for passenger, Intermediate Survey is to be carried out within 3 months before or after each anniversary date. *(2022)*

* Note : Where, high-speed craft means ships subject to HSC Code or ships subject to standards for high-speed craft of the Korean Ship Safety Act.

**2.** Intermediate Survey may be carried out in advance even if it is not due, upon application by an Owner.

However, if Intermediate Survey is carried out more than 3 months earlier than the anniversary date, the anniversary date will be newly assigned to the date of 3 months later than the date on which the survey was completed. *(2023)*

**3.** "A part of Intermediate Survey items" which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey, except those ships mentioned in **Par 1** of which Intermediate Survey is to be carried out every year. *(2021)*

Note : "A part of Intermediate Survey items" means the following items among all survey items of Intermediate Survey.

(1) Compartments survey(except compartments which are to be surveyed at each periodical survey)
(2) Thickness measurement
(3) Docking Survey as a part of Intermediate Survey(except the ships of which Docking Survey is to be carried out at each periodical survey)
(4) Overhauling survey of machinery(except the ships subject to CMS or PMS)

**4.** A survey planning meeting is to be held prior to the commencement of the survey.

**5.** Concurrent crediting to both Intermediate Survey and Special Survey for surveys and thickness measurements of spaces are not acceptable.

## 302. Hull, equipment and fire-extinguishing appliances

At the Intermediate Survey, in addition to all the requirements for Annual Survey, the following items are to be surveyed:

**1.** Internal examination of ballast tanks and cargo spaces are given in **Table 1.2.1.**

Table 1.2.1 Internal examination of ballast tanks and cargo spaces

| | 5 years< age ≤ 10 years | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|---|
| Ballast tanks | Representative ballast tanks[1), 2), 3), 4)] | All ballast tanks[2), 3), 4)] | All ballast tanks[2), 3), 4)] |
| Cargo holds | - | 1. Ships carrying logs: each one of cargo hold at the forward and aft ends | 1. Ships carrying logs: each one of cargo hold at the forward and aft ends<br>2. Ships carrying dry cargoes[5)]: selected cargo holds |
| Cargo tanks[6)] | - | Selected cargo tanks | Selected cargo tanks |

(NOTES)

1) If there is no hard protective coating, soft or semi-hard coating, or POOR coating condition, the examination is to be extended to other ballast tanks of the same type.

2) If such examinations reveal no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains effective.

3) For ballast tanks, excluding double bottom ballast tanks, if there is no hard protective coating, soft or semi-hard coating, or POOR coating condition and it is not renewed, the tanks in question is are to be internally examined at annual intervals. *(2020)*

4) When such condition as above 3) are found in double bottom ballast tanks, the tanks in question may be internally examined at annual intervals. *(2020)*

5) General dry cargo ships subject to **Sec 15** or, bulk carriers or double skin bulk carriers subject to **Ch 3, Sec 2** or **Sec 6** are exempted and each relevant requirements are applied.

6) Liquefied gas carriers subject to **Sec 16** or, oil tankers, chemical tankers or double hull oil tankers subject to **Ch 3, Sec 3, Sec 4** or **Sec 5** are exempted and each relevant requirements are applied.

**2.** For fire-extinguishing appliances, the survey is to be in accordance with "the Guidance" relating to the Rules. *(2023)*

Note : "the Guidance" means the requirements specified in **202.** of the Guidance. In this case, for foam fire-extinguishing systems, the foam is to be tested by the manufacturer or recognized test organization and the test records are to be submitted for approval.

**3.** For ships subject to the enhanced survey programme such as **bulk carriers, oil tankers** and **chemical tankers**, etc., in addition to items of **Par 1** through **Par 2**, the additional requirements in accordance with **Ch 3** are to be taken. However, if the duplicated survey items are exist, these are not to be applied twice.

**4.** In addition to **Par 1** through **Par 2, Ch 15** is also to be taken for general dry cargo ships and **Ch 16** is also to be taken for liquefied gas carriers. However, if the duplicated survey items are exist, these are not to be applied twice.

**5.** In addition to **Par 1** through **Par 2**, relevant requirements of **Ch 18** and/or **Ch 19** are also to be taken if applicable.

## 303. Machinery, electrical installations and additional installations

At each Intermediate Survey, in addition to all the requirements of Annual Survey, the following requirements are to be complied with.

### 1. Steam turbines for main engines

(1) Examinations are to be carried out while rotating the rotor after removing the upper part of the turbine and rotor shaft bearings. The examinations on rotors may be dispensed with when deemed unnecessary by the Surveyor. **【See Guidance】**

(2) The clutch coupling is to be examined.

**2. Internal combustion engines for main engines**

(1) Partial open-up survey for one cylinder is, in principle, to be carried out as follows, however, the extent may be extended when deemed necessary by the Surveyor. **【See Guidance】**

(A) Internal examinations of the cylinders and combustion side of the cylinder covers are to be carried out. Pistons may not have to be removed except when deemed necessary by the Surveyor.

(B) Examinations are to be carried out while rotating the crank shaft after removing the upper part of the main bearing and crank-pin bearing corresponding to the cylinder opened. The deflection of crank webs are to be measured and where deemed necessary the alignment of the bearing are to be adjusted.

(2) Examination for high-rotating-speed internal combustion engines is to be done by the requirement specified in the above (1), but the measurement for crank web deflections may be dispensed with. However, where total running hours for the internal combustion engine is confirmed and found in satisfactory by the Surveyor, the survey may be extended until next overhauling hours recommended by the manufacturer since the previous overhauling survey. **【See Guidance】**

(3) The survey for a passenger ship is to be in accordance with the Guidance relating to the Rules. **【See Guidance】**

**3. Gas turbines for main engines【See Guidance】**

Survey for gas turbines are to be in accordance with the Guidance relating to the Rules. *(2018)*

**4. Auxiliary engines**

Examinations on auxiliary engines driving generators(except emergency use) and other auxiliary machinery related with ship propulsion are to be carried out in accordance with the requirements for main engine.

**5. Other essential auxiliaries 【See Guidance】**

General examinations are to be carried out on other essential auxiliary machinery. Detailed examinations may, however, be required when deemed necessary by the Surveyor.

**6. Electrical installations 【See Guidance】**

Where deemed necessary by the Surveyor, insulation resistance test is to be made.

**7.** The surveys for water jet propulsion systems and azimuth or rotatable thruster are to be carried out in accordance with the **Annex 1-9** of Guidance. *(2021)*

**8.** The surveys for additional installations(cargo refrigerating installations, cargo handling appliances, automation and remote control systems, dynamic positioning system, navigation bridge systems, hull monitoring systems, diving system, high voltage shore connection systems, cargo vapour emission control systems and ballast water management, etc.) are to be carried out in accordance with the requirements specified in **Pt 9**, etc.

**9.** Gas-fuelled ships other than ships carrying liquefied gases in bulk and ships carrying CNG in bulk are also to meet with the requirements in **Ch 4, 302.** of the **Rules/Guidance for the Classification of Ships Using Low-flashpoint Fuels,** in addition to the requirements in this section.

**10.** The Surveys for Exhaust gas emission abatement system(SCR, EGR & EGCS) are to be carried out in accordance with **Guidance for Prevention System of Pollution from Ships** *(2022)*

**11.** In addition to **Par 1** through **Par 10**, relevant requirements of **Ch 19** are also to be taken if applicable. *(2021)*

## 304. Additional requirements to ship types 【See Guidance】

At each Intermediate Survey, in addition to all the requirements of Annual Survey, the following requirements are to be complied with.

**1. Oil tankers(including tankers) *(2020)* :**

The additional requirements are to apply to Intermediate Survey as follows, as far as practicable.

(1) Should there be any doubt as to its condition when examining the various piping systems, the piping may be required to be pressure tested, gauged or both. Particular attention is to be paid

to repairs such as welded doublers.

(2) Testing the insulation resistance of electrical circuits in dangerous zones such as cargo pump rooms and area adjacent to cargo tanks but in case where a proper record of testing is maintained consideration should be given to accepting recent readings.

(3) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

**2. Chemical tankers :**

The additional requirements are to apply to Intermediate Survey as follows, as far as practicable.

(1) Verifying from the cargo record book that the pumping and stripping arrangements have been emptying the tanks efficiently and are all in working order;

(2) Confirming, if possible, that the discharge outlets are in good condition;

(3) Confirming the satisfactory operation of the recording device, as fitted, and verifying by an actual flow test that it has an accuracy of ± 15 % or better;

(4) Confirming that the ventilation equipment for residue removal is satisfactory and that the pressure in the driving medium for portable fans for ventilation equipment for residue removal can be achieved to give the required fan capacity.

(5) Examination of vent line drainage arrangements.

(6) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

(7) Generally examining the electrical equipment and cables in dangerous zones such as cargo pump rooms and areas adjacent to cargo tanks to check for defective equipment, fixtures and wiring. The insulation resistance of the circuits should be tested and in cases where a proper record of testing is maintained, consideration should be given to accepting recent readings.

**3. Liquefied gas carriers :**

The additional requirements are to apply to Intermediate Survey as follows, as far as practicable. This survey is preferably to be carried out with the ship in a gas-free conditions. The extent of the testing required for this survey will normally be such that the survey cannot be carried out during a loading or discharging operation, and then testing cargo handling installations with related automatic control, alarm and safety systems for correct functioning.

(1) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

(2) Generally examining the electrical equipment and cables in hazardous areas and zones such as cargo machinery spaces and areas adjacent to cargo tanks to check for defective equipment, fixtures and wiring. The insulation resistance of the circuits should be tested and in cases where a proper record of testing is maintained consideration should be given to accepting recent readings. *(2024)*

(3) Confirming that the heating arrangements, if any, for steel structures are satisfactory.

(4) The instrumentation of the cargo installation with regard to pressure, temperature and liquid level is to be visually examined and to be tested by changing the pressure, temperature and level as applicable and comparing with test instruments. Simulated testing may be accepted for sensors which are not accessible or for sensors located within cargo tanks or inerted hold spaces. The testing is to be include testing of alarm and safety function.

(5) The piping of the gas detection system is to be visually inspected for corrosion and damage as far as practicable. The integrity of the suction lines between suction points and analyzing units is to be verified as far as possible. Gas Detectors are to be calibrated or verified with sample gases.

(6) The emergency shutdown system is to be tested, without flow in the pipe lines, to verify that

the system will cause the cargo pumps and compressors to stop.

(7) Electrical equipment in gas-dangerous spaces and zones is to be examined as far as practicable with particular respect to the following:

(A) Protective earthing(Spot check)
(B) Integrity of enclosures
(C) Damage of outer sheath of cable
(D) Function testing of pressurized equipment and of associated alarms
(E) Testing of systems for de-energizing non-certified safe electrical equipment located in spaces protected by air-locks, such as electrical motor-rooms, cargo control room, etc.

(F) Testing of insulation resistance of circuits. Such measurements are only to be made when the ship is in a gas-free or inerted condition. Where proper records of testing are maintained consideration may be given to accepting recent readings by the ship's crew.

(8) The instrumentation and safety systems for burning cargo as fuel are to be examined in accordance with (5). Inspection and maintenance of electrical equipment installed in hazardous area shall be complied with the requirements given in IEC60079-17, Part 17.

(9) Examination for non-metallic membranes of pressure relief valves for cargo tanks in accordance with the Guidance relating to the Rules. **【See Guidance】**

# Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)

## 401. Due range

**1.** The first Special Survey is to be completed within 5 years from the date of the initial Classification Survey and thereafter within 5 years from the credited date of the previous Special Survey.

Under 'exceptional circumstances', the Society may grant an extension not exceeding three(3) months to allow for completion of the Special Survey provided that the vessel is attended and the attending Surveyor(s) so recommend(s) after the following has been carried out:

Where 'exceptional circumstance' means unavailability of dry-docking facilities; unavailability of repair facilities; unavailability of essential materials, equipment or spare parts; or delays incurred by action taken to avoid severe weather conditions.

(1) Annual Survey;
(2) re-examination of Conditions of Class; *(2020)*
(3) progression of the Special Survey as far as practicable;
(4) in the case where dry docking is due prior to the end of the class extension, an underwater examination is to be carried out by an approved diving company. An underwater examination by an approved company may be dispensed with in the case of extension of dry-docking survey not exceeding 36 months interval provided the ship is without outstanding Condition of Class regarding underwater parts. *(2020)*

In this case, the next period of class will start from the expiry date of the Special Survey before the extension was granted.

**2.** In the case that the Certificate of Classification will expire when the vessel in expected to be at sea, an extension to allow for completion of the Special Survey may be granted provided there is documented agreement to such an extension prior to the expiry date of the certificate, and provided that positive arrangements have been made for attendance of the Surveyor at the first port of call, and provided that the Society is satisfied that there is technical justification for such an extension.

Such an extension is to be granted only until arrival at the first port of call after the expiry date of the certificate. However, if owing to 'exceptional circumstances' the Special Survey cannot be completed at the first port of call, above **Par 1** may be followed, but the total period of extension shall in no case be longer than three(3) months after the original due date of the Special Survey.

**3.** For surveys completed within 3 months before the expiry date of the Special Survey, the next period of class will start from the expiry date of the Special Survey. For surveys completed more than 3 months before the expiry date of the Special Survey, the next Special Survey shall be assigned at the date of 5 years after the completion date of the concerned Special Survey.

In cases where the vessel has been laid up or has been out of service for a considerable period because of a major repair or modification and the Owner elects to only carry out the overdue surveys, the next period of class will start from the expiry date of the Special Survey. If the Owner elects to carry out the next due Special Survey, the next Special Survey shall be assigned at the date of 5 years after the completion date of the concerned Special Survey.

**4.** The Special Survey including docking survey, compartment survey and thickness measurement may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date. *(2022)*

Note : 1) For passenger ships, submersibles, nuclear ships, high speed crafts, and WIG Craft for passenger, this requirement does not apply.

2) In applying Note 1 above, high-speed craft means ships subject to HSC Code or ships subject to standards for high-speed craft of the Korean Ship Safety Act.

**5.** When the "Special Survey is commenced" prior to the 4th Annual Survey, the entire survey is to be completed within 15 months if such work is to be credited to the Special Survey. *(2021)*

Note : 1) For passenger ships, submersibles, nuclear ships, high speed crafts, and WIG Craft for passenger, this requirement does not apply.

2) In applying Note 1 above, high-speed craft means ships subject to HSC Code or ships subject to standards for high-speed craft of the Korean Ship Safety Act.

3) "Special Survey is commenced" means the following items among all survey items of Special Survey.

(1) Compartments survey(except compartments which are to be surveyed at each Periodical Survey)

(2) Thickness measurement

(3) Docking Survey(except the ships of which Docking Survey is to be carried out at each periodical survey)

(4) Overhauling survey of machinery(except the ships subject to CMS or PMS)

(5) Examination of **403. 1** (3) of the Rules

(6) Examination of **Sec 5-2, 3** of the Rules

**6.** A survey planning meeting is to be held prior to the commencement of the survey.

**7.** Concurrent crediting to both Intermediate Survey and Special Survey for surveys and thickness measurements of spaces are not acceptable.

**8. Continuous Survey of Hull**

For ships other than those subject to **Ch 3 Hull Surveys of Ships subject to the Enhanced Survey Programme** and **Sec 15 Hull Surveys for General Dry Cargo Ships,**

(1) A part of hull items of the Special Survey can be carried out on the Continuous Survey System basis, at the request of an Owner if has been approved by the Society.

A part of hull items of the Special Survey(i.e. hull continuous survey items) means the internal examination, thickness measurements, survey in dry-dock, survey for anchor/chain cables, tank pressure test and survey for hatch covers/ coamings. Ships on the Continuous Survey System are not exempt from other periodical surveys.

(2) When such a system is adopted all the hull continuous survey items of the particular Special Survey must be completed at the end of the five-year Special Survey period.

(3) During each survey cycle, all the hull continuous survey items are to be surveyed (and tested, where required) in regular rotation, as far as practicable, with uniform annual share within the five-year Special Survey period.

In general, approximately 20 % of the total number of the hull continuous survey items of the Special Survey is to be completed each year.

(4) At the end of the five-year Special Survey period, for the purpose of completion of Special Survey, a survey at least in the scope of an Annual Survey is be carried out during which the Surveyor will satisfy himself/herself as to whether all items required to be surveyed have been surveyed throughout, and with satisfactory results.

The Surveyor may inspect individual parts again if "deemed necessary by the Surveyor". *(2023)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 1** of the Guidance.

(5) The Owner is entitled to fix the sequence in which the individual hull continuous survey items are intended to be surveyed. However, the sequence in each survey cycle shall be linked with that of the previous one in such a way that the interval between consecutive (in two cycles) examinations of each hull continuous survey items should not generally exceed five years.

The survey in dry-dock may be held at any time within the five-year Special Survey period, provided all the requirements of **Sec 6** are also complied with.

For ships more than 10 years of age, the ballast tanks are to be internally examined twice in each five-year Special Survey period, i.e. once within the scope of the Intermediate Survey and once within the scope of the Continuous Survey of Hull for the Special Survey.

(6) The Surveyor may extend the inspection at his/her discretion, to other items if the inspections carried out revealed any defects.

(7) The approval for surveys to be carried out on a Continuous Survey System basis may be withdrawn at discretion of the Society.**【See Guidance】**

## 402. Kinds of Special Surveys

The first Special Survey on a ship after the Classification Survey during Construction is designated as Special Survey No. 1 and subsequent Special Surveys are designated as Special Survey No. 2, No. 3, etc. The kinds of Special Surveys on a ship for the Classification Survey after Construction are to be determined based upon the Special Surveys applied to the Classification Survey according to the ship's age.

## 403. Requirements of survey *(2018)*

**1.** The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull, equipment and related piping, as required in (9), are in satisfactory condition and is fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and the periodical surveys being carried out at the due dates.

The examinations of the hull are to be supplemented by thickness measurements and tank testing as required in (12) and (13), to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages, or other structural deterioration, that may be present. *(2021)***【See Guidance】**

(1) The vessel is to be placed in a drydock or upon a slipway and all items of **603.** are to be examined. However ships subject to the "Extended Dry-docking Interval System" specified in **605.**, this examination can be carried out in accordance with **605.** *(2021)***【See Guidance】**

(2) Hatch covers and coamings
The hatch covers and coamings are to be surveyed as follows:

(a) A thorough inspection of the items listed in **202. 1** (1) and (6), including Close-up Survey of hatch cover plating and hatch coaming plating, is to be carried out. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey shall be done of accessible parts of hatch covers structures.

(b) Checking of the satisfactory operation of all mechanically operated hatch covers is to made, including:

(i) stowage and securing in open condition
(ii) proper fit and efficiency of sealing in closed condition
(iii) operational testing of hydraulic and power components, wires, chains and link drives

(c) Checking of the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent as necessary.

(3) The anchors and chain cables are to be ranged, examined and the required complement and condition verified. The chain locker, holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker tested.

At Special Survey No. 2 and subsequent Special Surveys, chain cables are to be gauged and renewed in cases where their mean diameter is 12 % or more below the original required nominal size. *(2023)*

Note : Where ships subject to “Extended Dry-docking Interval System" specified in 605. are carried out In-water Survey in lieu of Docking Survey during Special Survey, and provided they were examined/tested as far as practicable specified in (3) and found in a satisfactory condition, the range and examination of anchors and chain cables(including measurements, if applicable), internal examination of chain lockers and testing of the pumping arrangements for the chain lockers may be carried out next scheduled Docking Survey.

(4) Inside of the hull is to be examined after articles not permanently attached to the hull are removed as far as possible and after all limber boards, mud boxes, strainers of bilge suction pipes,

etc. are opened and interior of the hull is cleaned.

(5) All decks are to be examined, attention being paid to the welded parts of the strength deck, structures in way of discontinuities and corners of hatchway openings, etc. It is also to be ascertained whether the deck composition satisfactorily adheres to the plating.

(6) The protected structures are to be examined in accordance with **Table 1.2.2.【See Guidance】**

**Table 1.2.2 Examination of the protected structures at each Special Survey**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 and Subsequent |
|---|---|---|
| 1) Single bottom construction is to be examined after removing at least one strake of bottom ceilings on each side of the centerline and the bilges and flooring plates in machinery space where deemed necessary. Special attention is to be paid to ascertain that the cement of other composition laid on the inner surface of bottom plating is in satisfactory condition.<br><br>2) Where a double bottom is fitted, a sufficient amount of ceiling as deemed necessary by the Surveyor is to be removed and the condition of the top plating examined. | In addition to the requirements of Special Survey No. 1,<br><br>1) Throughout the ship, in way of single bottoms one strake of ceilings on each side near to the keelson and in way of double bottoms and deep water or oil tanks ceilings at bilge (including limber hole) and centre line part, lower parts of pillars and bulkheads, shaft tunnels and any other parts deemed necessary by the Surveyor are to be removed and the internal structures are to be examined.<br><br>2) Shell plating in way of the side scuttles is to be examined with special attention, and where deemed necessary by the Surveyor, the thickness of the said parts and any other parts of the structure being excessively corroded is to be gauged.<br><br>3) The condition of steel deck plating under wooden deck is to be examined by drilling the worn parts of wooden deck. | In addition to the requirements of Special Survey No. 2,<br><br>1) All ceilings, sparrings, wood linings, casings in the holds, and floor plates in the machinery spaces are to be removed in sufficient quantities to enable the Surveyor to examine the conditions of structure under them. The ship is to be made free from rust inside and outside in order to expose for examination the framing and plating together with discharges, scuppers, air and sounding pipes, and the steel-work is to be examined.<br><br>2) Wood planks and other covering on steel decks are to be removed as required by the Surveyor and examined. Cement chocks on the ship's sides at bilges and decks are to be examined, portions of them are to be removed as deemed necessary by the Surveyor so that the condition of the shell plating and adjacent steel-work can be ascertained.<br><br>3) Where deemed necessary by the Surveyor, the lining in way of the side scuttles is to be removed as required by the Surveyor, and the shell plating examined.<br><br>4) Where the holds are insulated for carriage of refrigerated cargoes, the limbers and hatches are to be removed, and where considered necessary by the Surveyor, a sufficient amount of insulation is to be removed in each of the chambers to enable the Surveyor to ascertain the condition of the plating and framing. |

(7) Internal examination of spaces *(2020)*

(a) All spaces within the hull and superstructure in accordance with **Table 1.2.3** are to be internally examined.

(b) When tanks are examined internally, the plating and framing, bilges and drain wells, sounding, venting, pumping and drainage arrangements within the tanks and spaces are to be examined.

(c) Where provided, the condition of corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where soft or semi-hard coating has been applied, of where a hard protective coating was not applied from time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as "deemed necessary by the Surveyor". *(2023)*

Note : "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(d) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out. *(2023)*

Note : "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

**Table 1.2.3 Minimum requirements for Internal examination of spaces at each Special Survey** *(2020)*

| Spaces \ No. of Special Survey | | Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | S. Survey No. 4 and Subsequent |
|---|---|---|---|---|---|
| Cargo holds(and their 'tween decks where fitted), cargo tanks | | ○ | ○ | ○ | ○ |
| Double bottom tanks, deep tanks, ballast tanks, peak tanks | | ○ | ○ | ○ | ○ |
| Pump room, pipe tunnel, duct keel, machinery spaces, dry spaces, cofferdams, void spaces | | ○ | ○ | ○ | ○ |
| Structural downflooding ducts and structural ventilation ducts(If installed)[3] *(2022)* | | – | – | ○ | ○ |
| Fuel oil tanks△ | Engine room | – | – | 1 | 1 |
| | Cargo length area | – | 1 | 2 | Half, minimum 2 |
| | If no tanks in Cargo length area, additional fuel tank(s) outside of engine room(if fitted) | – | 1 | 1 | 2 |
| Lubrication oil tanks△ | | – | – | – | 1 |
| Fresh water tanks△ | | – | 1 | ○ | ○ |
| Bilge Holding Tank *(2022)* | | ○ | ○ | ○ | ○ |
| Other tanks in E/Room (ex, waste –/sludge –/drain –/ bilge – etc.) *(2022)* | | – | – | 1 | ○ |

(NOTES)

1. Purpose of tank has a priority in application.

   ○ : All tanks and spaces are to be internally examined.
   △ : As follows:

   1) These requirements apply to tanks of integral (structural) type.
   2) If a selection of tanks is accepted to be examined, then different tanks are to be examined at each Special Survey, on a rotational basis.
   3) Peak tanks (all uses) are subject to internal examination at each Special Survey.
   4) At Special Survey No. 3 and subsequent surveys, one deep tank for fuel oil in the cargo length area is to be included, if fitted.

2. Fuel oil tanks which do not form part of the ship's structures are to be examined in accordance with **502. 2.** (9), (c). *(2020)*

3. Definitions : downflooding ducts and ventilations ducts which are integrated to the ship's structures

   1) **Downflooding ducts** are fitted in order to meet the SOLAS damage stability criteria. Their purpose is to transfer water to a lower compartment in case of water ingress and thereby improve stability in the damaged condition. Downflooding ducts are normally found on the ship sides, integrated into the structure by using the side shell plating as one of their boundaries.

   2) **Structural ventilation ducts** are stiffened in such a way that the boundaries can withstand loads other than just the loads from air pressure and may be integrated with the ship structure or self supporting. These ducts are used in cases where a ventilation duct is crossing a watertight bulkhead, or in spaces that may be filled in case of damages according to the damage scenarios calculated for the ship. (Ex, Structural ventilation ducts installed in cargo length area for the carriage of vehicles such as RoRo Ship, Passenger Ship-RoRo or Passenger Ship-Car Ferry etc. One of their boundaries is composed of a side shell plating, which is integrated into the ship's structure.)

(8) The arrangements for mooring and anchoring are to be examined and their performances are to be tested. However, the performance tests may be dispensed with “at the discretion of the Surveyor”. *(2023)*

Note : The term "at the discretion of the Surveyor" means the other cases except for the cases as specified in **Ch 1, 801. 6** of the Guidance.

(9) The performance of hand bilge pumps is to be tested. All bilge and ballast piping systems are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

(10) Fire protection, fire equipment and its operation tests.

(11) For **container ships,** equipped with container securing arrangements in accordance with **Pt 7, Ch 4, 1003.** of the Rules, the container securing arrangements are to be examined as follows: *(2018)*

(a) Visual inspection for cell guides and securing devices(cracks, fractures, etc. of welds).
(b) Confirmation of comparison between on-board record book and securing devices.

(12) Thickness measurement *(2023)*

(a) Thickness measurements are to be carried out in accordance with **Table 1.2.4.** The Surveyor may extend the thickness measurements as “deemed necessary”.

When thickness measurements indicate substantial corrosion, the extent of thickness measurements is to be increased to determine areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the survey is credited as completed.

Note : The term "deemed necessary" means the other cases except for the cases as specified in **Ch 1, 801. 3** of the Guidance.

(b) For the ships specified by the Society, the longitudinal strength is to be evaluated after carrying out the thickness measurements in accordance with the requirement specified in (a) above. However, the only thickness measurement records which have been measured within one(1) year period from the date of the longitudinal strength evaluation shall be considered valid.

**Table 1.2.4 Minimum requirements for Thickness Measurements at Special Survey**
**1. General Ships *(2023)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas throughout the vessel | 1. Suspect areas throughout the vessel<br>2. One transverse section of deck plating within the amidships 0.5 $L$(in way of a cargo space, if applicable) | 1. Suspect areas throughout the vessel<br>2. Two transverse sections within the amidships 0.5 $L$ (in way of two cargo spaces, if applicable)[4), 5), 6), 7)]<br>3. All cargo hold hatch covers and coamings (plating and stiffeners)[9)]<br>4. Internals in forepeak and afterpeak water ballast tanks *(2020)*<br>5. All transverse bulkheads in all cargo tanks[8)]<br>6. All transverse bulkheads in all ballast tanks[8)] | 1. Suspect areas throughout the vessel<br>2. A minimum of three transverse sections within the amidships 0.5 $L$(in way of cargo spaces, if applicable)[5), 6), 7)]<br>3. All cargo hold hatch covers and coamings (plating and stiffeners)[9)]<br>4. Internals in forepeak and aftpeak water ballast tanks *(2020)*<br>5. All exposed main deck plating full length<br>6. Representative exposed superstructure deck plating (poop, bridge and forecastle deck)<br>7. Lowest strake and strakes in way of 'tween decks of all transverse bulkheads in cargo spaces together with internals in way<br>8. All wind and water strakes, port and starboard, full length<br>9. All keel plates full length. Also, additional bottom plates in way of cofferdams, machinery space and aft end of tanks<br>10. Plating of seachests. Shell plating in way of overboard discharges as considered necessary by the attending Surveyor<br>11. All transverse bulkheads and one web frame ring in all cargo tanks[8)]<br>12. All transverse bulkheads and all web frame ring in all ballast tanks[8)] |

(NOTES)

1) In application to this table, General Ships* means ships except Other Ships in **Table 1.2.4, 2.** *(2022)*
(* In case there is a separate requirement for thickness measurement in the relevant classification technical rules, the relevant classification technical rules are to be applied.)

2) Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.

3) Thickness measurements of internals may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating by the Surveyor if the hard protective coating is in GOOD condition. *(2019)*

4) For ships more than 100 meters in length, at Special Survey No. 3, thickness measurements of exposed deck plating within amidship 0.5 $L$ may be required.

5) For ships less than 100 meters in length, the number of transverse sections required at Special Survey No. 3 may be reduced to one (1), and the number of transverse sections required at Special Survey No. 4 and subsequent may be reduced to two (2).

6) For the pure car carrier, the extent of thickness measurement for transverse sections may be considered as follows:
- Exposed deck plate, side shell plate, bottom shell plate, inner bottom plate and longitudinal members in double bottom spaces.

7) Where the evaluation of longitudinal strength is required, all longitudinal structural members at the corresponding sections are to be gauged.

8) This requirement is to be applied only for tankers(including barges) carrying liquid cargo.

9) Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, thickness measurement shall be done of accessible parts of hatch covers structures.

**Table 1.2.4 Minimum requirements for Thickness Measurements at Special Survey (continued)**
**2. Other Ships**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas throughout the vessel | 1. Suspect areas throughout the vessel<br>2. One transverse section of deck plating[5], side shell plating and bottom plating within the amidships 0.5 $L$ | 1. Suspect areas throughout the vessel<br>2. Two transverse sections of deck plating[5], side shell plating and bottom plating within the amidships 0.5 $L$<br>3. Internals in forepeak and afterpeak water ballast tanks *(2020)* | 1. Suspect areas throughout the vessel<br>2. Two transverse sections of side shell plating within the amidships 0.5$L$<br>3. Full length,<br>1) All exposed main deck plating[5]<br>2) Representative exposed superstructure deck plating(poop, bridge and forecastle deck)<br>3) Selected wind and water strakes<br>4) Bottom plating<br>5) Flat keel plating<br>4. Internals in forepeak and afterpeak water ballast tanks *(2020)* |

(NOTES)

1) In application to this table, Other Ships* means the ship specified as follows except Special Purpose Ship - Waste in **Annex 1-1, 1.1** of the Guidance relating to the Rules. *(2022)*

- the ship type 12, 13
- the ship less than 500 GT and not engaged on international voyages among ship type **15, 16, 17, 19, 20** and **26** to **32**

(* In case there is a separate requirement for thickness measurement in the relevant classification technical rules, the relevant classification technical rules are to be applied.)

2) Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion.

3) Thickness measurements of internals may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating by the Surveyor if the hard protective coating is in GOOD condition. *(2019)*

4) When the evaluation of longitudinal strength is required, all longitudinal members at the corresponding sections are to be gauged.

5) For fishing vessel, thickness measurement requirements in way of deck(gutter water way part and hatch coaming part) may be modified at the discretion of the Surveyor if the structure remains effectively protected against corrosion by a permanent type special coating.

**Table 1.2.5 Requirements for extent of thickness measurement at those areas of substantial corrosion**

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| Plating | Suspect area and adjacent plates | 5 point pattern over 1 $m^2$ |
| Stiffeners | Suspect area | 3 measurements each in line across web and flange |

(13) Tank testing *(2023)*

(a) Tank testings are to be carried out in accordance with **Table 1.2.6.**
(b) Tanks may be tested afloat at the discretion of the Surveyor, provided that the internal examination of the bottom is also carried out afloat.

**Table 1.2.6 Minimum requirements for tank testing**

| No. of Special Survey / Tanks | Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|---|
| All water tanks (including cargo holds used for ballast and excluding fresh water tank) and all cargo tanks *(2018)* | ○ | ○ | ○ | ○ |
| Fuel oil tank, lubrication oil tank, fresh water tank, bilge holding tank and other tanks in E/Room (ex, waste -/sludge -/drain -/ bilge - etc.) *(2022)* | △ | △ | △ | △ |

(NOTES)

1. Purpose of tank has a priority in application.
2. Boundaries of tanks are to be tested with a head of liquid to the top of air pipes or to near the top of hatches for ballast/cargo holds. Boundaries of fuel oil, lube oil and fresh water tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions.
3. ○ : All tanks are to be tested.
   △ : *(2020)*
   1) These requirements apply to tanks of integral (structural) type.
   2) Tank testing of fuel oil, lube oil and fresh water tanks, etc. may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results. *(2022)*
   3) Fuel oil tanks which do not form part of the ship's structures are to be examined in accordance with **502. 2.** (9), (c).
4. For the cargo tanks(except cargo tanks for the liquefied natural gas), tests may be dispensed with, provided after an external and internal examination of the tanks, the Surveyor is satisfied with the condition of the tanks.
5. The Surveyor may extend the testing as "deemed necessary". Where "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*

(14) Where "considered necessary by the Surveyor", the effectiveness of shell plating, watertight bulkheads, shaft tunnels, watertight doors and the closing appliances of openings on superstructure end bulkheads is to be confirmed. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(15) Engine room structure is to be examined. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and engine room bulkheads in way of tank top and bilge wells.

Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating.

Where wastage is evident or suspect, thickness measurements are to be carried out, and renewals or repairs made when wastage exceeds allowable limits. *(2018)*

(16) For all ships, automatic air pipe heads are to be completely examined(both externally and internally) as indicated in **Table 1.2.7.** *(2025)*

For designs where the inner parts cannot be properly inspected from outside, this is to include removal of the head from air pipe. Particular attention is to be paid to the condition of the zinc coating in heads constructed from galvanized steel. *(2018)*

**Table 1.2.7 Survey requirements for automatic air pipe heads at Special Survey**

| Special Survey No. 1[1), 2)] | Special Survey No. 2[1), 2)] | Special Survey No. 3 and Subsequent[3)] |
|---|---|---|
| · Two air pipe heads, one port and one starboard, located on the exposed decks in the forward 0.25 $L$, preferably air pipes serving ballast tanks<br><br>· Two air pipe heads, one port and one starboard, on the exposed decks, serving spaces aft of 0.25 $L$, preferably air pipes serving ballast tanks | · All air pipe heads located on the exposed decks in the forward 0.25 $L$<br><br>· At least 20% of air pipe heads on the exposed decks serving spaces aft of 0.25 $L$, preferably air pipes serving ballast tanks | · All air pipe heads located on the exposed decks |

(NOTES)

1) The selection of air pipe heads to be examined is left to the attending Surveyor.
2) According to the results of this examination, the Surveyor may require the examination of other heads located on the exposed deck.
3) Exemption may be considered for air pipe heads where there is substantial evidence of replacement after the last Special Survey.

(17) For ships provided with a loading instrument on longitudinal strength in accordance with the requirements of **Pt 3, Ch 3, 104.,** this checking is to be done in the presence of the Surveyor. *(2025)*

(18) For ships provided with a loading instrument on stability in accordance with the requirements of **Ch 1, 307.,** the following items are to be confirmed. *(2025)*

(A) This checking for all approved test loading conditions is to be done in presence of the Surveyor.

(B) The testing procedure shall be carried out in accordance with **Annex 1-10** Loading Instrument on Stability, 3. (9).

(19) Surveys of Watertight Cable Transits *(2021)*

(A) The requirements for Special Survey may be undertaken by the attending Surveyor or by a firm approved as a service supplier according to the **Guidance for Approval of Service Suppliers.**

(B) All transits are to be examined to confirm their satisfactory condition and the Register is to be reviewed to confirm it is being maintained. The Special Survey is to be recorded in the

Register, in which a single record entry will be sufficient to record the survey of all transits.

(C) From review of the Register, where there are records entered since the last special survey of any disruption to the cable transits or installation of new cable transits (except which are reviewed and examined at previous annual surveys), the satisfactory condition of those transits is to be confirmed by the attending Surveyor by review of records and examination of the transits; the results are to be recorded in the Register against each of those cable transits.

(D) In case the cable transits have been examined by an approved service supplier, the attending surveyor is to review the Register in order to ascertain that it has been properly maintained by the owner and correctly endorsed by the service supplier.

(20) For ships provided with the equipment employed in the mooring of ships at single point mooring specified in **Pt 4, Ch 10, 101. 7** and assigned the additional class notation "EQ-SPM", the function and deformation condition of this equipment employed in the mooring of ships at single point mooring and hull supporting structures are to be closely checked and confirmed its satisfactory conditions. Where “deemed necessary”, non-destructive examinations may be required. *(2023)*

Note : The term "deemed necessaryr" means the cases as specified in **Ch 1, 801. 2** of the Guidance.

**2.** For ships subject to the enhanced survey programme such as **bulk carriers, oil tankers** and **chemical tankers**, etc., in addition to items of **Par 1** the additional requirements in accordance with **Ch 3** are to be taken. However, if the duplicated survey items are exist, these are not need to be applied twice.

**3.** For additional requirements applicable to water level detectors fitted on single hold cargo ships, refer **Sec 15.**

**4.** In addition to **Par 1, Ch 15** is also to be taken for general dry cargo ships and **Ch 16** is also to be taken for liquefied gas carriers. However, if the duplicated survey items are exist, these are not need to be applied twice.

**5.** In addition to **Par 1, Ch 17** is also to be taken for shell and inner doors, etc. of RoRo ships. However, if the duplicated survey items are exist, these are not to be applied twice.

**6.** In addition to **Par 1**, relevant requirements of **Ch 18** and/or **Ch 19** are also to be taken if applicable.

## 404. Fire-extinguishing appliances *(2023)*

For fire-extinguishing appliances, the survey is to be in accordance with the **302. 2.**

# Section 5-1 Special Survey (Machinery, Electrical Installations and Additional Installations)

## 501. Due range

The due range of Special Survey(Machinery, electrical installations and additional installations) is to be complied with the requirements specified in **401.**

## 502. Requirements of survey

At the Special Survey(Machinery, electrical installations and additional installations), in addition to the requirements for Intermediate Survey, the following requirements are to be complied with.

### 1. Requirements of main engines and auxiliary engines

(1) At the Special Survey for main engines, the following requirements are to be conformed to with respect to the type of engine, where deemed necessary by the Surveyor, control devices, governing devices and safety devices are to be tested. **【See Guidance】**

(a) For internal combustion engines, cylinders, cylinder covers, pistons, piston rods and connecting rods, crosshead(including pins, bearings and guides), crank shafts and all bearings, elasticity couplings, cam shafts and their driving gears, essential valves and valve arrangements, fuel oil pumps and fittings, scavenging pumps, scavenging blowers, superchargers, intercoolers, filter or oil separators and safety devices, clutches, reverse gears, attached pumps and coolers, crank cases and explosion relief devices are to be opened up and examined, and the deflections of crank arms are to be measured. And, effectiveness of vibration damper is to be confirmed and balancers are to be examined.

However, those total running hours not more than the overhauling time recommended by the manufacturer since the previous overhauling survey, the survey is to be in accordance with the Guidance relating to the Rules. **【See Guidance】**

(b) Examinations for high-rotating-speed internal combustion engines of specific construction such that complete engine overhaul is required for surveys may be in accordance with the Guidance relating to the Rules. **【See Guidance】**

(c) Where the propulsion steam turbines are of a well known type, and fitted with rotor position indicators and vibration indicators of an approved type, as well as measuring equipment of steam pressure at proper locations along the steam flow, and the arrangements for change over in case of emergency operation of the plant are readily operable, the first Special Survey may be limited to be examination of rotor bearings, thrust bearings and flexible couplings, provided the Surveyor has been satisfied from operation service records and power trials subsequent to the survey, that the turbine plant is in good working condition. Turbine casings should be opened at the next second Special Survey and subsequent Special Surveys.

(d) Survey for gas turbines are to be in accordance with the Guidance relating to the Rules. *(2018)* **【See Guidance】**

(2) For auxiliary engines, the requirements corresponding to those of the main engine are to be conformed to.

### 2. Requirements of machinery except for main engines and auxiliary engines *(2018)*

(1) All shafts(except the propeller and stern tube shafts), thrust blocks and line shaft bearings are to be examined. The lower halves of bearings need not be exposed, if alignment and wear are found satisfactory.

(2) Reduction gears are to be examined. Where deemed necessary by the Surveyor, reduction gears are to be opened up and the gear wheels, pinions, gear shafts and bearings are to be examined. **【See Guidance】**

(3) Air compressors with their intercoolers, filters and/or oil separators and safety devices, and all pumps and components used for essential services are to be opened up as considered necessary by the Surveyor and examined. **【See Guidance】**

(4) Operational conditions of steering gear are to be examined. Where deemed necessary by the Surveyor, main parts are to be opened up and examined. **【See Guidance】**

(5) Operational conditions of windlass, mooring winches and cargo winches are to be examined. Where deemed necessary by the Surveyor, main parts of them are to be opened up and examined. **【See Guidance】**

(6) Evaporators are to be opened up and examined. Their safety valves are also to be checked under working condition.

(7) The foundation bolts and chocks of main and auxiliary engines, gear casings, thrust blocks and line shaft bearings are to be examined.

(8) All air receivers and other pressure vessels for essential services together with their mountings and safety devices are to be opened up and examined internally and externally. If internal examination of them is not practicable, they are to be tested hydraulically to 1.5 times the working pressure, and if considered necessary by the Surveyor, performance test of safety valves for the above mentioned devices is to be carried out. **【See Guidance】**

(9) Pumping and piping arrangements

(a) Valves, cocks and strainers of the bilge system including the emergency bilge suction valves are to be examined. And where deemed necessary by the Surveyor, opening up examination of above items or effectiveness test of the bilge system is to be carried out. **【See Guidance】**

(b) The fuel oil, feed and lubricating oil systems, the ballast pipe connections and blanking arrangement to the ballast holds and all filters, heaters, coolers and condensers for essential services are to be opened up and examined. The pressure tests may be carried out, including safety devices, where deemed necessary by the Surveyor. **【See Guidance】**

(c) Fuel oil tanks which do not form part of the ship's structure are to be examined internally and externally and, if considered necessary by the Surveyor, they are to be tested to the pressure specified for new tanks. At the Special Survey No. 1, internal examination of the tanks may be dispensed with, provided they are found satisfactory in external examination. All mountings, fittings and remote controls are to be examined as far as practicable. **【See Guidance】**

(10) Where deemed necessary by the Surveyor, the performance tests of pressure gauges, revolutions and thermometers are to be made. **【See Guidance】**

(11) Where automatic and remote controls are fitted up for essential machinery, they are to be tested to demonstrate that they are in good working order.

(12) Main steam pipes, where considered necessary by the Surveyor are to be examined after removing the lagging indicated by the Surveyor. The thickness of pipes is also to be checked as necessary. **【See Guidance】**

(13) The following safety inspections are to be carried out for the cargo refrigerating machinery given in **Pt 5, Ch 6, 1201. 1.**

(a) Leaks of the refrigerants are to be tested while the machinery is examined in running condition.

(b) Coils of coil type condensers and evaporators, shell tube type condensers and shells of receivers are to be tested at a pressure of at least 90 percent of the design pressure. Where, however, relief valves attached to them are adjusted to a pressure less than the design pressure, the test pressure may be reduced to a pressure of 90 percent of the pressure to which the relief valves are adjusted. The above pressure test may be dispensed with except for those using $NH_3$ or $CH_3Cl$ as refrigerants.

(14) The survey for towing winch emergency release system which is specified in **Pt 7, Ch 9, Sec. 8** the following requirements are to be complied with. *(2021)*

(A) The Annual Survey requirements are to be carried out, with the additional instructions for special survey provided by the manufacturer, as appropriate, being followed.

(B) The full functionality of the emergency release system is to be tested to the satisfaction of the surveyor. Testing may be conducted either during a bollard pull test or by applying the load against a strong point on the deck of the tug or the shore that is certified to the ap-

propriate load.

(C) The emergency release system is to be tested at a towline load that is equal to the lesser of 30% of the maximum design load or 80% of vessel bollard pull in both a normal power condition and power blackout condition to the satisfaction of the surveyor.

(15) The Surveys for Exhaust gas emission abatement system(SCR, EGR & EGCS) are to be carried-out in accordance with **Guidance for Prevention System of Pollution from Ships** *(2022)*

**3. Electrical equipment**

In the Special Survey for electrical equipment, the following requirements are to be conformed to.

(1) Main and emergency switchboards, section panels, and sub-distribution fuse panels are to be examined and overcurrent protective devices and fuses inspected to verify that they provide suitable protection for their respective circuits.

(2) The generators are to be running under the loaded condition, either separately or in parallel and the performances of speed governors, switches and circuit breakers are to be tested.

(3) The insulation resistances of generators, switchboards, motors, cables and other electrical equipment are to be tested and adjusted if it is found not to comply with the requirements given in **Pt 6, Ch 1, 1701. 1.** However, this test may be dispensed with, where it is found that the measured records remain efficient and they comply with the requirements specified in **Pt 6, Ch 1, 1701. 1.**

(4) Where deemed necessary by the Surveyor, the lighting arrangements, internal communication and signalling systems, mechanical ventilation systems, and other electrical equipment are to be tested for effectiveness. **【See Guidance】**

**4.** The surveys for water jet propulsion systems and azimuth or rotatable thruster are to be carried out in accordance with the **Annex 1-9** of the Guidance. *(2021)*

**5.** The surveys for additional installations(cargo refrigerating installations, cargo handling appliances, automation and remote control systems, dynamic positioning system, navigation bridge systems, hull monitoring systems, diving system, high voltage shore connection systems, cargo vapour emission control systems and ballast water management, etc.) are to be carried out in accordance with the requirements specified in **Pt 9**, etc.

**6.** Gas-fuelled ships other than ships carrying liquefied gases in bulk and ships carrying CNG in bulk are also to meet with the requirements in **Ch 4, 303.** of the **Rules/Guidance for the Classification of Ships Using Low-flashpoint Fuels**, in addition to the requirements in this section.

**7.** Where CMS specified in **Sec 9** is applied, the performance test for safety devices including the items other than CMS are to be surveyed.

**8.** A mooring trial is to be carried out to attending Surveyor's satisfaction to confirm satisfactory operation of main and auxiliary machinery.

**9.** In addition to **Par 1** through **Par 8**, relevant requirements of **Ch 19** are also to be taken if applicable.

# Section 5-2 Special Survey (Additional Requirements to Ship Types)

The Special Survey(Additional requirements to ship types), in addition to the requirements for Intermediate Survey, shall be carried out as follows.

## 1. Oil tankers(including tankers) :

The additional requirements are to be surveyed as follows,

(1) For pump room, in particular, the foundations and gland seals of pumps, stuffing box, sealing arrangements of all penetrations of bulkheads and ventilating arrangements are to be examined.

(2) Condition of the inner surface of the bottom plating in cargo tanks is to be examined in order to ascertain that there is no excessive pitting of the plating.

(3) Bell mouths of the cargo suction pipes in cargo tanks are to be removed to enable examination of the shell plating and bulkheads in that vicinity.

(4) All piping systems in the spaces, cargo oil pipes on weather deck, breather valves, flame screens on vents, purge systems, gas free systems, inert gas systems and other piping systems are to be examined. When "considered necessary by the Surveyor", pressure tests and/or gaugings for pipings are to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** and/or **4** of the Guidance.

(5) For inert gas system, the following items are to be examined, "when appropriate", opened-up. *(2023)*

(A) Major parts of inert gas scrubbers.
(B) Major parts of inert gas blowers.
(C) Major parts of non-return devices(e.g., deck water seal).
(D) Major parts of flue gas isolating valves.
(E) Major parts of P/V breakers.

Note : The term "when appropriate" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(6) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

## 2. Chemical tankers :

The additional requirements are to be surveyed as follows,

(1) Foundation of cargo containments, including supports, keys and anti-rolling/anti-pitching devices are to be examined.

(2) Closing and sealing devices of the domes of cargo containments, where they penetrate decks are to be examined.

(3) The pumps are to be opened and examined.

(4) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

## 3. Liquefied gas carriers :

The additional requirements are to be surveyed as follows,

(1) Cargo containment survey

(A) All cargo tanks are to be examined internally.

(B) Special attention is to be paid to the cargo tank and insulation in way of chocks, supports, keys and other parts which consist of the foundation of tanks. Removal of insulation may be

required in order to verify the condition of the tank or the insulation itself if found necessary by the Surveyor. Where the arrangement is such that the insulation cannot be examined, the surrounding structure of the wing tanks, double bottom tanks and cofferdams are to be examined for cold spots when the cargo tanks are in the cold condition unless voyage record together with the instrumentation give sufficient evidence of the integrity of the insulation system. *(2023)*

Note : The Surveyor is to consider the following items and so on when require to remove insulations.

1) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
2) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
3) where wastage is evident or suspect
4) where considered to be prone to rapid wastage

(C) Non-destructive test *(2023)*

Non-destructive testing is to supplement cargo tank inspection with special attention to be given to the integrity of the main structural members, tank shell and highly stressed parts, including welded connection as "deemed necessary by the Surveyor". However, for type C tanks, this does not mean that non-destructive testing can be dispensed with totally. The following items are, inter alia, considered as highly stressed parts:

- cargo tank supports and anti-rolling/anti-pitching devices
- web frames or stiffening rings
- swash bulkhead boundaries
- dome and stump connections to tank shell
- foundations for pumps, towers, ladders, etc.
- pipe connections

For the independent tank type B, the extent of non-destructive testing shall be given in a programme specially prepared for the cargo tank design.

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 2** of the Guidance.

(D) The tightness of all cargo tanks is to be verified by an appropriate procedure. Provided that the effectiveness of the ships's gas detection equipment has been confirmed, it will be acceptable to utilize this equipment for the tightness test of independent tanks below deck.

(E) Where findings of (A) to (D) or an examination of the voyage records raises doubts as to the structure integrity of a cargo tank, a hydraulic or hydro-pneumatic test is to be carried out. For integral tanks and for independent tank type A and B, the test pressure is to be carried out in accordance with proper pressure based on design of each tank. For independent tank type C, the test pressure is not to be less than 1.25 times the MARVS.

(F) At every other special survey(i.e., 2nd, 4th, 6th, etc) all independent cargo tank type C are to be either:

(a) Hydraulically or hydro-pneumatically tested to 1.25 times MARVS, followed by non-destructive testing in accordance with (C), or

(b) Subjected to a thorough, planned non-destructive testing. This testing is to be carried out in accordance with a programme specially prepared for the tank design. If a special program does not exist, the following applies:

- cargo tank supports and anti-rolling/anti-pitching devices
- stiffening rings
- Y-connections between tank shell and a longitudinal bulkhead of tanks
- swash bulkhead boundaries
- dome and stump connections to the tank shell
- foundations for pumps, towers, ladders etc.
- pipe connections

At least 10 % of the length of the welded connections in each of the above mentioned areas is to be tested. This testing is to be carried out internally and externally as applicable. Insulation is to be removed as necessary for the required non-destructive test.

(2) As far as practicable all hold spaces and hull insulation(if provided), secondary barriers and tank supporting structures are to be visually examined. The secondary barriers is to be checked for their effectiveness by means of a pressure/ vacuum test, a visual inspection or another acceptable method.

(3) Membrane and semi-membrane tank

(A) For membrane and semi-membrane tanks systems, inspection and testing are to be carried out in accordance with programmes specially prepared in accordance with an approved method for the actual tank system.

(B) For membrane containment systems, a tightness test of the primary and secondary barrier shall be carried out in accordance with the system designers' procedures and acceptance criteria as approved by the classification society. Low differential pressure tests may be used for monitoring the cargo containment system performance, but are not considered an acceptable test for the tightness of the secondary barrier.

(C) For membrane containment systems with glued secondary barriers if the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing should be carried out.

(4) The pressure/vacuum relief valve, rupture disc and other pressure relief devices for interbarrier spaces and hold spaces are to be opened, tested and readjusted as necessary, depending on their design. *(2023)*

Note : The term "as necessary" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

(5) The pressure relief valves for the cargo tanks are to be opened for examination, adjusted, function tested, and sealed. If the cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are be replaced. Where a proper record of continuous overhaul and retesting of individually identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapor relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since crediting of the previous Special Survey.

(6) Piping systems

(A) The cargo, liquid nitrogen and process piping systems, including valves, actuators, compensators etc. are to be opened for examination as deemed necessary. Insulation is to be removed as deemed necessary to ascertain the condition of the pipes. If the visual examination raises doubt as to the integrity of the pipelines, a pressure test at 1.25 times the MARVS for the pipeline is to be carried out. After reassembly the complete piping systems are to be tested for leaks. *(2023)*

Note : The Surveyor is to consider the following items and so on when require to remove insulations.

1) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
2) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
3) where wastage is evident or suspect
4) where considered to be prone to rapid wastage

(B) The pressure relief valves are to be function-tested. A random selection of valve is to be opened for examination and adjusted.

(7) Components

Cargo pumps, compressors, process pressure vessels, liquid nitrogen tanks, heat exchangers and other components, including prime movers, used in connection with cargo handling and methane boil-off burning are to be examined.

(8) Miscellaneous

(A) Systems for removal of water or cargo from interbarrier spaces and holds are to be examined and tested as "deemed necessary". *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 1** of the Guidance.

(B) All gas-tight bulkhead are to be inspected. The effectiveness of gas-tight shaft sealing is to be verified.

(C) Hose and spool pieces used for segregation of piping systems for cargo, inert gas and bilging are to be examined.

(D) Check that cargo tanks, process plant and piping systems specified in **Pt 7, Ch1, 1104.** are electrically bonded and connected to the hull of the ships by visual inspection. *(2024)*

## Section 6 Docking Survey

### 601. Due range 【See Guidance】

**1.** There is to be a minimum of two examinations of the outside of the ship's bottom and related items during each five-year Special Survey period. One such examination is to be carried out in conjunction with the Special Survey. In all cases the interval between any two such examinations is not to exceed 36 months.

**2.** Notwithstanding the requirements specified in **Par 1** above, for passenger ships, submersibles, nuclear ships, high speed crafts and WIG Craft for passenger, the docking survey is to be a part of the Periodical Survey. But the Docking Survey may be subject to the requirements as provided separately by the Society. *(2022)*

* Note : Where, high-speed craft means ships subject to HSC Code or ships subject to standards for high-speed craft of the Korean Ship Safety Act.

**3.** In addition to **Par 1** through **Par 2**, relevant requirements of **Ch 19** are also to be taken if applicable.

### 602. Extension of survey

The Docking Survey may be extended upon the request of the Owner as follows:

**1.** Where the Special Survey is extended in accordance with **401. 1** and **2**, an extension of Docking Survey can be granted in accordance with the requirements specified in **401. 1** (4).

**2.** An extension of Docking Survey of 3 months beyond the due date can be granted upon the approval of the Society in exceptional circumstances defined in **401. 1.**

### 603. Requirements of survey

**1.** The ship is to be placed in a drydock or on a slipway, and it is to be placed on blocks of sufficient height and with the necessary staging to permit the examination of elements such as shell plating including bottom and bow plating, stern frame and rudder, sea chests and valves, propeller, etc.

**2.** The shell plating is to be examined for excessive corrosion, or deterioration due to chafing or contact with the ground and for any undue unfairness or buckling. “Special attention” is to be paid to bilge keels. *(2021)*

Note : The term "special attention" means a careful examination of the connection between the bilge strakes and the bilge keels.

**3.** Rudder, rudder pintles, rudder shafts and couplings and stern frame are to be examined. If “considered necessary by the Surveyor”, the rudder is to be lifted or the inspection plates removed for the examination of pintles. The clearance in the rudder bearings is to be ascertained and recorded. If it exceeds the values given below, the bush is to be adjusted. Where applicable, pressure test of the rudder may be required “as deemed necessary” by the Surveyor. *(2023)*

Note :

1) The term "considered necessary by the Surveyor" in that "If considered necessary by the Surveyor, the rudder is to be lifted or the inspection plates removed for the examination of pintles." means the cases as specified in **Ch 1, 801. 1** of the Guidance.

2) The term "as deemed necessary" in that "the pressure test of the rudder may be required as

deemed necessary by the Surveyor." means the case which repair work relating with the air tightness of rudder is done and/or the cases as specified in **Ch 1, 801. 1** of the Guidance.

| Pintle (Diameter of Pintle : $d_p$) | Allowable clearance |
|---|---|
| $d_p \leq$ 50 mm | 3.0 mm |
| 50 mm $< d_p \leq$ 100 mm | 5.0 mm |
| 100 mm $< d_p$ | 0.01 $d_p$ + 4.0 mm |
| Neck bearing (Diameter of rudder stock : $d_s$) | 0.01 $d_s$ + 2.0 mm |

**4.** Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need not be opened up- more than once in a special survey period (5 years) unless "considered necessary by the Surveyor". *(2025)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

**5.** The propeller is to be examined. The efficiency of the oil gland, if fitted, is to be ascertained and clearance or weardown in the stern bush are to be measured. For controllable pitch propellers and special type propellers, the sealing and tightness conditions are to be ascertained and recorded. In the case where the pitch control device is fitted, it is to be ascertained that the device is in good working order. However, if "considered necessary by the Surveyor", the device is to be opened up for further examination. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

**6.** Visible parts of side thrusters and anti-rolling devices are to be examined. Other propulsion systems which also have manoeuvring characteristics (such as waterjet propulsion systems, azimuth or rotatable thrusters/directional propellers, vertical axis propellers) are to be examined externally with focus on the condition of gear housing, propeller blades, bolt locking and other fastening arrangements and sealing arrangement of propeller blades, propeller shaft and steering column shall be verified. Furthermore the surveys are to be carried out in accordance with **Annex 1-9** of the Guidance. *(2021)*

**7.** The clearance between the propeller shaft and the after bearing of stern tube as well as the shaft bracket if fitted is to be measured for water-lubricated stern tube bearings, and if it exceeds the values given below, the bearing is to be replaced or repaired. Stern tube shafts are also to be comply with these requirements.

| Diameter of propeller shaft $D_p$ | Allowable clearance |
|---|---|
| $D_p \leq$ 230 mm | 6.0 mm |
| 230 mm $< D_p \leq$ 305 mm | 8.0 mm |
| 305 mm $< D_p$ | 9.5 mm |

**8.** For ships with IWS notation, the requirements to assign the IWS notation specified in **604. 3.** (8) are to be confirmed for continuing compliance.

**9.** For ships with EDD notation, the requirements to assign the EDD notation specified in **605. 2.** are to be confirmed for continuing compliance. *(2023)*

Note : In case ships are subject to "Extended Dry-docking Interval System" which have been carried out In-water Survey in lieu of Docking Survey during Special Surveys, the requirements specified in **403. 1** (3) are to be carried out.

## 604. In-water Survey

**1.** The Society may accept an In-water Survey in lieu of the intermediate docking between Special Surveys required in a five year period on ships less than 15 years of age. "Special consideration of the Society is to be given" to ships of 15 years of age or over before being permitted to have such In-water Survey. For ships with ESP notation of 15 years of age and over, such In-water Surveys are not to be allowed. *(2021)*

Note : "Special consideration is to be given" means survey status, latest docking survey reports and thickness measurement records, etc. are to be considered.

**2.** In-water Survey in lieu of the Docking Survey may be restricted at the discretion of the Society if there are record or indication of abnormal deterioration, existing outstanding Condition of Class for repairs, or damage to underwater part of the shell plating, the rudder, the propeller, the propeller shaft, sea connections or overboard discharge valves. *(2020)*

**3.** Where an In-water Survey in lieu of the intermediate docking between Special Surveys is desired, the survey procedures are as follows:

(1) Plans and documents

The following plans and documents are to be submitted to the Surveyor and the divers.

(a) Plans of shell plating below waterline showing the location and sizes of shell openings, location of bottom plugs, location of appendages, location of measuring position of navigation instruments, location of bilge keels, location of water-tight and oil-tight bulkheads, and location of welded seams and butts including any doublers and straps.

(b) Detailed information or drawing of constructions and arrangements indicated in (2) below.

(2) Constructions, arrangements, etc.

Where an In-water Survey in lieu of the docking survey is desired, the following construction and arrangements are to be made.

(a) Rudder arrangements are to be such that rudder pintle clearances can be checked.
(b) Rope-guard ring plates are to be of such construction as to facilitate the inspection of shaftings between propeller hubs and stern frame boss.

(c) In case of water lubricated stern tube bearings, the construction is to be suitable for confirmation and measurement of the clearance between the propeller shafts and these bearings.

(d) In case of oil lubricated stern tube bearings, suitable means of ascertaining the performances of stern tube bearings including oil sealing devices are to be provided.

(3) Condition of survey
(a) In the lightest draught condition as possible.
(b) The condition of hull below waterline and hull bottom is can be ascertained.
(c) The sea state conditions such as tidal stream, current, swell, etc. at the location of the survey are to be calm and peaceful. The in-water visibility and the cleanliness of the hull below the waterline is to be clear enough to permit a meaningful examination which allows the Surveyor and "firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle(ROV)" to determine the condition of the plating, appendages and the welding. *(2019)*

(d) The distance between hull bottom and sea bottom is to be enough.
(e) In-water Survey is to be carried out by "firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle(ROV)"approved by the Society. *(2019)*

(4) Survey extent
(a) The In-water Survey is to provide the information normally obtained from a Docking Survey.

Special consideration shall be given to ascertaining rudder bearing clearances and stern bush weardown of oil stern bearings based on a review of the operating history, on board testing and stern oil sample reports. These considerations are to be included in the proposals for

In-water Survey which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Society.

(b) General inspection for sea connections and overboard discharge valves, at inside of the ship

(5) Practice of In-water Survey
(a) In-water Survey is to be carried out in the presences of the Surveyor and the Owner.
(b) All preparations required for an In-water Survey are to be made by the Owner.
(c) The Surveyor shall confirm the preparation for survey and the operational condition of In-water Survey equipment.

(d) The Surveyor shall know the status of the ship in advance, and inform the diver before diving of survey items and measurement.

(e) The means are to be provided to maintain good communication between the Surveyor and the underwater diver at all times.

(f) The Surveyor may confirm the status of survey by in-water photographs, cameras, television monitors and other means.

(g) In a job site, the results of In-water Survey shall be immediately reported to the Owner, and the Owner and diver sign their names on the Diving Report, confirming the result.

(6) Diving report

The following items are to be stated in the diving report.

(a) Name of "firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle(ROV)" *(2019)*

(b) Name of diver and licence No.
(c) Date and place of survey
(d) Name of equipment used in In-water Survey
(e) Name of ship, classification character and notations, gross tonnage, port of registry, owner of ship
(f) Drafts(forward and aft)
(g) Contents and results of survey(damage configuration and status, etc.)

(7) Further surveys
(a) The Surveyor may require the further examination such as internal examinations, thickness measurement, etc. where “deemed necessary by the Surveyor” as a result of the In-water Survey *(2023)*

Note : The term "deemed necessary by the Surveyor" means the cases where the damage of internal structural member is evident or suspect, the cases as specified in **Ch 1, 801. 3** and/or **6** of the Guidance.

(b) If the result of In-water Survey reveals damage or deterioration that requires early attention, the Surveyor may require that the ship be dry-docked in order that a detailed survey can be undertaken and the necessary repairs carried out.

(8) For a ship with IWS of additional special feature notation, the following requirements are to be complied with, in addition to the requirements specified in preceding (1) to (7). *(2023)*

(a) The plans and documents specified in (1) and (b) to (c) below are to be submitted to the Society for approval, and are to be kept on board.

(b) To the shell plating below load waterline, provision is to be made for ready identification of the position of bulkhead.

(c) Ships contracted for construction or intended to have IWS notation newly, on or after 1 July 2011, are to be complied with the following requirements additionally.

(i) A suitable means of ascertaining the position and identity of each blade of the propellers are to be provided.

(ii) Hinged gratings are to be installed on all sea chests and constructed so as to facilitate opening and closing by the diver.

(iii) Markings indicating the position of longitudinal and transverse bulkheads and the names of interior spaces, sea suction and overboard discharge openings on the shell plating below the load water line are to be provided so that the diver is able to orient his/her position relative to the ship.

Such markings may be consist of a weld bead or center punch, and a contrasting color coating. Other suitable arrangements or means may be considered as equivalent where “deemed appropriate by the Society”. *(2021)*

Note : The term "deemed appropriate by the Society" means the cases where name plate, signal device and/or position indicating device, etc. is provided so that the diver is able to orient his/her position relative to the ship.

## 605. Extended Dry-docking Interval System

### 1. General

(1) The "Extended Dry-docking Interval System" is in any case subject to approval by the relevant flag state. The approval or acceptance of this rule by the relevant flag state doesn't means the approval for the application of Extended Dry-docking Interval System on the relevant ship, and the separate approval by the each relevant flag state is required for the application of Extended Dry-docking Interval System.

(2) The "Extended Dry-docking Interval System" applies to ship types as following; *(2019)*
(A) Liquefied Gas Carrier notation,
(B) Ro-Ro Ship notation,
(C) Container Ship notation,
(D) Cargo Ship notation(incl. General Dry Cargo Ships specified in **Sec 15.**),
(E) Barge notation.

(3) In application to **601. 1**, at the request of the Owners, where “deemed appropriate by the Society” considering survey history, damage history and coating conditions, etc. it is possible until the ship reaches 15 years of age to perform the first and second Docking Survey due from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey as an In-water Survey, and the third Docking Survey has to be performed in dry-dock or on a slipway within 7.5 years from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey. *(2023)*

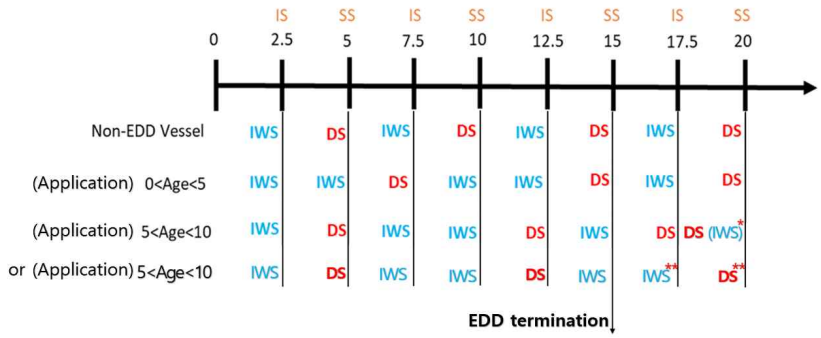
Note : The term "deemed appropriate by the Society" means the cases where all requirements specified in **605.** of the Rules are comply with.

(4) The Owner can apply to join the "Extended Dry-docking Interval System" before the date on which the ship reaches 10 years of age.

When the Owner applied to join the "Extended Dry-docking Interval System" after the No.1 Special Survey and the Docking Survey assigned between 10 years to 15 years of age has carried out in dry-dock or on a slipway, the No. 3 Special Survey may be carried out as an In-water Survey, and afterwards the first Intermediate docking survey and each Special Survey shall, in principle, be carried out in dry-docking or on a slipway.

However, where the requirements of **403. 3. Ch 2** of the Guidance are complied with, the Docking Survey as a part of Special Survey may be replaced by In-water Survey.

In addition, notwithstanding **605, 1.** (3), when the Owner applied to join the "Extended Dry-docking Interval System" after the No.1 Special Survey, the "Extended Dry-docking Interval System" may be applied up to the 20 years of age provided that where “Special consideration” is obtained from the Society in advance upon the application of the Owner. *(2024)*
(refer to below figure)




Note : 1. Where IS, SS, IWS and DS mean Intermediate Survey, Special Survey, In—water Survey and Docking Survey respectively.

2. In case of "Special consideration", survey records including survey status and survey reports & etc. are to be reviewed to confirm that all requirements of **605. 1.** (1) and **605. 2.** are complied with.

* IWS shall be carried out in accordance with **403. 3**, **Ch 2** of the Guidance.
** In case the "Extended Dry-docking Interval System" is extended to 20 years of age after "Special consideration".

(5) In the case of a change in Owner or flag, the application of the "Extended Dry-docking Interval System" is to be reconsidered and a Docking Survey may be assigned or required immediately.

(6) The Society reserves the right to suspend the "Extended Dry-docking Interval System" at any time "if it is determined that a dry-docking is necessary". *(2023)*

Note : The term "if it is determined that a dry-docking is necessary" means the following cases and so on.

(A) where the necessary requirements for Extended Dry-docking Interval System are not comply with **605. 2** of the Rules. *(2021)*

(B) where Docking Survey is necessary from the result of In-water Survey reveals damage or deterioration that requires repairs that affect the vessel's fitness for continued service. *(2021)*

(C) where withdrawal for application of the Extended Dry-docking Interval System is requested by the Owner

(D) where Docking Survey is necessary from the results of reconsideration for application of the approved Extended Dry-docking Interval System where the Owner or flag is changed

(7) The EDD notation shall be assigned as an additional special feature notation to ships carrying out the "Extended Dry-docking Interval System".

## 2. Necessary requirements

The necessary requirements for implementation of the "Extended Dry-docking Interval System" are as followings.

(1) To be applied the Owner's Hull Inspection and Maintenance Program according to **Annex 1-13** of the Guidance

(2) Ships contracted for construction on or after 1 July 2011 and classed through the Classification Survey during Construction are to have IWS notation according to **604. 3** (8), and the other ships can be carried out the In-water Survey according to **604. 2** and **3.**

(3) To have STCM(stern tube condition monitoring) notation. Ships not assigned STCM notation are to be fitted with a shaft bearing and sealing system of approved design with implementation of regular monitoring procedures

(4) For ships contracted for construction on or after 1 July 2011, the dry film thickness(DFT) of the

coating system for shell plating below the load water line excluding antifouling for the shell plating is to be more than 300 $\mu m$ and for the other ships it is to be more than 250 $\mu m$. In addition, the anodes are to be fitted and/or the impressed current cathodic protection system is to be installed and maintained.

(5) In lieu of (4) above, the Society may accept the other coating system provided that the coating manufacturer proves with relevant documents that the applied coating system is designed to last for the 7.5 years.

(6) Ballast tanks shall have a corrosion prevention system and to be maintained in GOOD coating condition.

(7) The hull below load waterline is to be free of any Condition of Class *(2022)* **【See Guidance】**

### 3. Approval and survey

(1) Documents and approval

For implementation of the "Extended Dry-docking Interval System" the following documents shall be presented to the Society. The Society will issue an approval document for the "Extended Dry-docking Interval System" after review the presented documents. This approval document is to be placed on-board.

(A) Application for "Extended Dry-docking Interval System"
(B) Description of the system for the "Extended Dry-docking Interval System" with flow charts of the system organization within the company
(C) Plans and/or information showing the ship is satisfy to the necessary requirements for the "Extended Dry-docking Interval System" specified in **Par 2** above including the followings
  (a) Manual for the Hull Inspection and Maintenance Program according to **Annex 1-13** of the Guidance
  (b) Inspection procedures for In-water Survey
  (c) Procedure for stern tube condition monitoring
  (d) Coating system for shell plating below the load water line
(D) Other documents as deemed necessary by the Society

(2) Implementation survey
(A) Additional to the approval according to (1) above, the implementation survey is to be carried out within one year from the date of the approval of the "Extended Dry-docking Interval System" to verify that the "Extended Dry-docking Interval System"is implemented in accordance with the approval document.
(B) During the implementation survey, the attending Surveyor is to check the following items.
  (a) An approval document for the "Extended Dry-docking Interval System"
  (b) Documents specified in **Par 3** (1) (B) to (D)
  (c) Whether the Master is familiar with the "Extended Dry-docking Interval System"
  (d) A random check for compliance of the necessary requirements specified in **Par 2** above including the followings.
    - Check whether the Owner's Hull Inspection and Maintenance Program specified in **Annex 1-13** of the Guidance is operated satisfactorily.
    - Check the stern tube condition monitoring
    - Check the impressed current cathodic protection system, if fitted

(3) Annual audit
(A) An annual audit is to be carried out to check the operation of the "Extended Dry-docking System" at Periodical Survey
(B) At the annual audit the attending Surveyor is to check the following items.
  (a) An approval document for the "Extended Dry-docking Interval System"
  (b) Documents specified in **Par 3** (1) (B) to (D)

(c) Whether the Master is familiar with the "Extended Dry-docking Interval System"
(d) Check for compliance of the necessary requirements specified in **Par 2** above including the followings.

- Check whether the Owner's Hull Inspection and Maintenance Program specified in **Annex 1-13** of the Guidance is operated satisfactorily and confirmation of random compartments
- Check the stern tube condition monitoring
- Check the impressed current cathodic protection system, if fitted

# Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.

## 701. General 【See Guidance】

1. Unless alternative means are provided to assure the condition of the propeller shaft assembly, these requirements apply to all vessels with conventional shafting fitted with a propeller. *(2018)*

2. The surveys for water jet propulsion systems and azimuth or rotatable thruster are to be carried out in accordance with **Annex 1-9** of the Guidance. *(2021)*

3. Definitions

(1) **Shaft** means propeller shaft and tube shaft, and does not include the intermediate shaft which is considered part of the propulsion shafting inside the vessel.
(2) **Propeller shaft** means the part of the propulsion shaft to which the propeller is fitted.
(3) **Stern tube shaft** means a shaft placed between the intermediate shaft and propeller shaft, normally arranged within a stern tube or running in open water.
(4) **Stern tube** means a tube or pipe fitted in the shell of a ship at the stern (or rear part of the ship), below the water-line, through which passes the tube shaft or aftermost section of the propeller shaft.
(5) **Oil lubricated bearing** means a bearing which uses oil to lubricate the bearings and is sealed against the environment(such as seawater) by adequate sealing devices.
(6) **Water lubricated bearing** means a bearing cooled and lubricated by water(fresh or salt).
(7) **Closed loop system fresh water lubricated bearing** means a bearing which uses fresh water to lubricate the bearings and is sealed against the environment(such as seawater) by adequate sealing devices.
(8) **Open system water lubricated bearing** means a bearing which uses water to lubricate the bearing and is exposed to the environment. *(2020)*
(9) **Adequate means for protection against corrosion** means an approved means for protection of the shaft against corrosion by sea water.
(10) **Corrosion resistant shaft** is a shaft which is made of approved corrosion resistant material.
(11) **Stern tube sealing system** means the equipment installed on the inboard extremity and, for closed systems, at outboard extremity of the sterntube.
  (A) Inboard Seal is the device fitted on the fore part of the sterntube that achieve the sealing against the possible leakage of the lubricant media in to the ship internal.
  (B) Outboard seal is the device fitted on the aft part of the sterntube that achieve the sealing against the possible sea water ingress and the leakage of the lubricant media.
(12) **Service records** are regularly recorded data showing in-service conditions of the shaft and may include, as applicable: lubricating oil temperature, bearing temperature and oil consumption records (for oil lubricated bearings) or water flow, water temperature, salinity, pH, make-up water and water pressure (for closed loop system fresh water lubricated bearings depending on design).
(13) **Oil sample examination** means a visual examination of the stern tube lubricating oil taken in presence of the surveyor with a focus on water contamination.
(14) **Lubricating oil analysis** means analyzing lubricating oil at regular intervals not exceeding 6 months taking into account IACS Rec.36(Recommended procedure for the determination of contents of materials and other contaminants in stern tube lubricating oil). The documentation on lubricating oil analysis is to be available on board. Oil samples, to be submitted for the analysis, is to be taken under service conditions.
(15) **Fresh water sample test** means a test to be carried out as follows:
  (A) Fresh water sample test is to be carried out at regular intervals not exceeding 6 months.
  (B) Samples are to be taken under service conditions and are to be representative of the water circulating within the sterntube.
  (C) Analysis results are to be retained on board and made available to the surveyor.
  (D) At time of survey, the sample for the test is to be taken at the presence of the surveyor.
  (E) Fresh water sample test is to include the following parameters:
    (a) chlorides content,
    (b) pH value,
    (c) presence of bearing particles or other particles (only for laboratory analysis, not required for tests carried out in presence of the Surveyor).

(16) **Keyless connection** means the forced coupling methodology between the shaft and the propeller without a key achieved through interference fit of the propeller boss on the shaft tapered end.
(17) **Keyed connection** means the forced coupling methodology between the shaft and the propeller with a key and keyway achieved through the interference fit of the propeller boss on the shaft tapered end.
(18) **Flanged connection** means the coupling methodology, between the shaft and the propeller, achieved by a flange, built in at the shaft aft end, bolted to propeller boss.
(19) **Alternative means** are shafting arrangements such as, but not limited to, an approved Condition Monitoring Scheme and / or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods as applicable in this Section. **【See Guidance】** *(2017)*

## 702. Oil lubricated shafts or closed loop system fresh water lubricated shafts

### 1. Shaft survey methods 【See Guidance】

(1) Method 1
(A) Drawing the shaft and examining the entire shaft, seals system and bearings
(B) For keyed and keyless connections, after removing the propeller to expose the forward end of the taper, examining by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway. For shaft provided with liners, the non-destructive examination is to be extended to the after edge of the liner. For keyless connections, when the propeller is force-fitted, the pull-up length is to be in accordance with the Guidance relating to the Rules.
(C) For flanged connection, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method:
(a) whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs, or
(b) when deemed necessary by the surveyor.
(D) Checking and recording the bearing clearances.
(E) Verification that the propeller is free of damages which may cause the propeller to be out of balance.
(F) Verification of the satisfactory conditions of inboard and outboard seals during the re-installation of the shaft and propeller.
(G) Recording the bearing weardown measurements (after re-installation)

(2) Method 2
(A) For keyed and keyless connections, after removing the propeller to expose the forward end of the taper, examining by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway. For keyless connections, when the propeller is force-fitted, the pull-up length is to be in accordance with the Guidance relating to the Rules.
(B) For flanged connection, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method:
(a) whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs, or
(b) when deemed necessary by the surveyor.
(C) Checking and recording the bearing weardown measurements.
(D) Visual Inspection of all accessible parts of the shafting system.
(E) Verification that the propeller is free of damages which may cause the propeller to be out of balance.
(F) Seal liner found to be or placed in a satisfactory condition.
(G) Verification of the satisfactory re-installation of the propeller including verification of satisfactory conditions of inboard and outboard seals.
(H) Pre-requisites to satisfactorily verify in order to apply Method2:
(a) Review of service records.
(b) Review of test records of:
(i) Lubricating oil analysis (for oil lubricated shafts), or
(ii) Fresh water sample test (for closed system fresh water lubricated shafts).

(c) Oil sample examination (for oil lubricated shafts), or fresh water sample test (for closed system fresh water lubricated).
(d) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

(3) Method 3
(A) Checking and recording the bearing weardown measurements.
(B) Visual Inspection of all accessible parts of the shafting system.
(C) Verification that the propeller is free of damages which may cause the propeller to be out of balance.
(D) Seal liner found to be or placed in a satisfactory condition.
(E) Verification of satisfactory conditions of inboard and outboard seals.
(F) Pre-requisites to satisfactorily verify in order to apply Method3:
(a) Review of service records.
(b) Review of test records of:
(i) Lubricating oil analysis (for oil lubricated shafts), or
(ii) Fresh water sample test (for closed system fresh water lubricated shafts).
(c) Oil sample examination (for oil lubricated shafts), or fresh water sample test (for closed system fresh water lubricated).
(d) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

## 2. Extension of shaft survey

(1) Instead of the survey specified in **Par 1**, after survey of the following items, the survey interval may be prolonged for not more than 2.5 years from the due date.
(A) Checking and recording the bearing weardown measurements, as far as practicable.
(B) Visual Inspection of all accessible parts of the shafting system.
(C) Verification that the propeller is free of damages which may cause the propeller to be out of balance.
(D) Verification of the effectiveness of the inboard seal and outboard seals.
(E) Pre-requisites to satisfactorily verify in order to apply extension up to 2.5 years:
(a) Review of service records.
(b) Review of test records of:
(i) Lubricating oil analysis (for oil lubricated shafts), or
(ii) Fresh water sample test (for closed system fresh water lubricated shafts).
(c) Oil sample examination (for oil lubricated shafts), or fresh water sample test (for closed system fresh water lubricated).
(d) Verification of no reported repairs by grinding or welding of shaft and/or propeller.
(e) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

(2) Instead of the survey specified in **Par 1**, after survey of the following items, the survey interval may be prolonged for not more than 1 year from the due date.
(A) Visual Inspection of all accessible parts of the shafting system.
(B) Verification that the propeller is free of damages which may cause the propeller to be out of balance.
(C) Verification of the effectiveness of the inboard seal and outboard seals.
(D) Pre-requisites to satisfactorily verify in order to apply extension up to 1 year:
(a) Review of the previous weardown and clearance recordings.
(b) Review of service records.
(c) Review of test records of:
(i) Lubricating oil analysis (for oil lubricated shafts), or
(ii) Fresh water sample test (for closed system fresh water lubricated shafts).
(d) Oil sample examination (for oil lubricated shafts), or fresh water sample test (for closed system fresh water lubricated).
(e) Verification of no reported repairs by grinding or welding of shaft and/or propeller.
(f) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

(3) Instead of the survey specified in **Par 1**, after survey of the following items, the survey interval may be prolonged for not more than 3 months from the due date.

(A) Visual Inspection of all accessible parts of the shafting system.
(B) Verification of the effectiveness of the inboard seal.
(C) Pre-requisites to satisfactorily verify in order to apply extension up to 3 months:
(a) Review of the previous weardown and clearance recordings.
(b) Review of service records.
(c) Review of test records of:
(i) Lubricating oil analysis (for oil lubricated shafts), or
(ii) Fresh water sample test (for closed system fresh water lubricated shafts).
(d) Oil sample examination (for oil lubricated shafts), or fresh water sample test (for closed system fresh water lubricated).
(e) Verification of no reported repairs by grinding or welding of shaft and/or propeller.
(f) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

### 3. Oil lubricated shafts

(1) Survey intervals
(A) For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

(B) Survey method and survey interval as per types of propeller connections are as follows:
(a) For flanged connection, Method1, Method2 or Method3 is applicable and the survey interval for each method is 5 years.
(b) For Keyless connection, Method1, Method2 or Method3 is applicable and the survey interval for each method is 5 years. The maximum of two consecutive Method 3 surveys is applicable and the maximum interval between two surveys carried out according to Method1 or Method2 is not to be exceed 15 years, except in the case when one extension for no more than 3 months is granted. *(2018)*
(c) For Keyed connection, Method1 or Method2 is applicable and the survey interval for each method is 5 years.

(2) Extension of survey
(A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows:
(a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted.
(b) Extension as per **Par 2** (2) (1 year extension): no more than two consecutive "1 year extensions" can be granted. In the event an additional extension is requested the requirements specified in **Par 2** (1) are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years. *(2017)*
(c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) or (1) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year or 2.5 years. *(2017)*

(B) Period of extension
(a) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.
(b) If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

### 4. Closed loop system fresh water lubricated shafts

(1) Survey intervals
(A) For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

(B) Survey method and survey interval as per types of propeller connections is as follows:
(a) For flanged connection, Method1, Method2 or Method3 are applicable and the survey interval for each method is 5 years.
(b) For Keyless connection, Method1, Method2 or Method3 are applicable and the survey interval for each method is 5 years.
(c) For Keyed connection, Method1 or Method2 are applicable and the survey interval for each method is 5 years.

(2) Extension of survey
(A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows:
(a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted.
(b) Extension as per **Par 2** (2) (1 year extension): no more than two consecutive "1 year extensions" can be granted. In the event an additional extension is requested the requirements specified in **Par 2** (1) are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years. *(2017)*
(c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) or (1) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year or 2.5 years. *(2017)*

(B) Period of extension
(a) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.
(b) If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

(3) In application of above (1) and (2), the maximum interval between two surveys carried out according to Method1 is not to exceed 15 years, except in the case when one extension for no more than three months is granted.

**5. A summary of survey intervals and survey methods specified in Par 1 to Par 4 is given in the following:**

| Oil Lubricated Shaft *(2017)* | | | |
|---|---|---|---|
| Type of propeller connection / Survey interval | Flanged connection | Keyless connection | Keyed connection[(b)] |
| Every 5 years[(a)] | Method1, Method2 or Method3 | Method1, Method2 or Method3[(c)] | Method1 or Method2 |
| Extension 2.5 years | Yes[(d)] | Yes[(d)] | Yes[(d)] |
| Extension 1 year | Yes[(e)] | Yes[(e)] | Yes[(e)] |
| Extension 3 months | Yes[(f)] | Yes[(f)] | Yes[(f)] |
| Closed Loop System Fresh Water Lubricated Shaft | | | |
| Type of propeller connection / Survey interval | Flanged connection | Keyless connection | Keyed connection[(b)] |
| Every 5 years[(a)] | Method1[(g)], Method2 or Method3 | Method1[(g)], Method2 or Method3 | Method1[(g)] or Method2 |
| Extension 2.5 years | Yes[(d)] | Yes[(d)] | Yes[(d)] |
| Extension 1 year | Yes[(e)] | Yes[(e)] | Yes[(e)] |
| Extension 3 months | Yes[(f)] | Yes[(f)] | Yes[(f)] |

(NOTES)

(1) For surveys (Method1, Method2 or Method3) completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

(2) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

(REMARKS)

(a) Unless an Extension type (Extension 2.5 years, Extension 1 year or Extension 3 months) is applied in between.

(b) Method 3 not allowed.

(c) Maximum of two consecutives Method 3 surveys. The maximum interval between two surveys carried out according to Method 1 or Method 2 shall not exceed 15 years, except in the case when one extension for no more than three months is granted.

(d) No more than one extension can be granted. No further extension of other type can be granted.

(e) No more than two consecutive extensions can be granted. In the event an additional extension is requested the requirements of the 2.5 year extension are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.

(f) No more than one three months extension can be granted. In the event an additional extension is requested the requirements of the 1 year extension or 2.5 years extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of 1 year or 2.5 years.

(g) The maximum interval between two surveys carried out according to Method 1 shall not be more than 15 years.

## 703. Open System Water Lubricated Shafts

### 1. Shaft survey methods

(1) Method4 【See Guidance】

(A) Drawing the shaft and examining the entire shaft(including liners, corrosion protection system and stress reducing features, where provided), inboard seal system and bearings

(B) For keyed and keyless connections, after removing the propeller to expose the forward end of the taper, examining by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway. For shaft provided with liners, the non-destructive examination is to be extended to the after edge of the liner. For keyless connections, when the propeller is force-fitted, the pull-up length is to be in accordance with the Guidance relating to the Rules.

(C) For flanged connection, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method:

(a) whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs, or

(b) when deemed necessary by the surveyor.

(D) Checking and recording the bearing clearances.

(E) Verification that the propeller is free of damages which may cause the propeller to be out of balance.

(F) Verification of the satisfactory conditions of inboard seals during the re-installation of the shaft and propeller.

### 2. Extension of survey

(1) Instead of the survey specified in **Par 1**, after survey of the following items, the survey interval may be prolonged for not more than 1 year from the due date.

(A) Visual Inspection of all accessible parts of the shafting system.

(B) Verification that the propeller is free of damages which may cause the propeller to be out of balance.

(C) Checking and recording the clearances of bearing.

(D) Verification of the effectiveness of the inboard seals.

(E) Pre-requisites to satisfactorily verify in order to apply extension up to 1 year:

(a) Review of the previous clearance recordings. *(2017)*

(b) Review of service records.

(c) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

(d) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

(F) No more than one extension can be granted. No further extension, as per below (2), can be granted.

(2) Instead of the survey specified in **Par 1**, after survey of the following items, the survey interval may be prolonged for not more than 3 months from the due date.

(A) Visual Inspection of all accessible parts of the shafting system.

(B) Verification that the propeller is free of damages which may cause the propeller to be out of balance.

(C) Verification of the effectiveness of the inboard seals.

(D) Pre-requisites to satisfactorily verify in order to apply extension up to 3 months:

(a) Review of the previous clearance recordings. *(2017)*

(b) Review of service records.

(c) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

(d) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

(E) No more than one extension can be granted. In the event an additional extension is requested, the requirements specified in above (1) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year.

(3) Period of extension
(A) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.
(B) If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

### 3. Survey intervals

Survey intervals between surveys according to Method 4 are as follows:
(1) For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.
(2) For keyless propeller connections, the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination is not to be exceed 15 years.

(3) Configurations allowing 5 year intervals
(A) Single shaft operating exclusively in fresh water.
(B) Single shaft provided with adequate means of corrosion protection, single corrosion resistant shaft.
(C) All kinds of multiple shafts arrangements.

(4) Shaft not belonging in one of the configurations listed in above (3) is to be surveyed every 3 years.

**4.** A summary of survey intervals and survey methods specified in **Par 1** to **Par 3** is given in the following:

<table>
<tr><td colspan="2">- Single shaft operating exclusively in fresh water.<br>- Single shaft provided with adequate means of corrosion protection, single corrosion resistant shaft.<br>- All kinds of multiple shafts arrangements.</td><td colspan="2">Other shaft configuration.</td></tr>
<tr><td colspan="2">All kinds of propeller connection[d]</td><td colspan="2">All kinds of propeller connection[d]</td></tr>
<tr><td>Every 5 years[a]</td><td>Method4</td><td>Every 3 years[a]</td><td>Method4</td></tr>
<tr><td>Extension 1 year</td><td>Yes[b]</td><td>Extension 1 year</td><td>Yes[b]</td></tr>
<tr><td>Extension 3 months</td><td>Yes[c]</td><td>Extension 3 months</td><td>Yes[c]</td></tr>
<tr><td colspan="4">(NOTES)<br>(1) For survey(Method4) completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.<br>(2) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.<br><br>(REMARKS)<br>(a) Unless an Extension type(Extension 1 year or Extension 3 months) is applied in between.<br>(b) No more than one extension can be granted. No further extension, of other type, can be granted.<br>(c) No more than one extension can be granted. In the event an additional extension is requested the requirements of the 1 year extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of 1 year.<br>(d) For keyless propeller connections, the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination is not to be exceed 15 years.</td></tr>
</table>

# Section 8 Boiler Survey

## 801. Due range

**1.** The following boilers(including thermal oil heaters) are to be internally examined minimum twice during each 5 year Special Survey period. In all cases the interval between any two such examinations is not to exceed 36 months. An extension of the internal examination of the boiler up to 3 months beyond the due date can be granted, in exceptional circumstance after survey required in **802. 2** is satisfactorily carried out. Where 'exceptional circumstance' means unavailability of repair facilities; unavailability of essential materials, equipment or spare parts; or delays incurred by action taken to avoid severe weather conditions.

(1) Water tube boilers used for propulsion, including reheat boilers
(2) All other boilers of essential service
(3) Boilers of non-essential service having working pressure exceeding 3.5 bar and a heating surface exceeding 4.5 $m^2$

**2.** For main boilers with smoke tube type or single main boiler with water tube type which are over 7.5 years of age, the surveys are to be carried out within 3 months before or after every year.

## 802. Survey items

**1.** The surveys of boilers are to be carried out as follows, and where deemed necessary by the Surveyor, the parts of lagging are to be removed and inspected. Where deemed necessary by the Surveyor, further surveys may be required. **【See Guidance】**

(1) At each survey, the boilers, superheaters and economizers are to be examined internally on water-steam side and fire side. Boiler mountings and safety valves are to be examined at each survey and opened out as considered necessary by the Surveyor. When direct visual internal inspection is not feasible due to the limited size of the internal spaces, such as for small boilers and/or narrow internal spaces, this may be replaced by a hydrostatic pressure test or by alternative verifications as determined by the Society. *(2017)* **【See Guidance】**

(2) The adjustment of the safety valves is to be verified during each boiler internal survey. Boiler safety valve and relieving gear are to be examined and tested to verify satisfactory operation. However, for exhaust gas heated economizers, if steam cannot be raised at port, the safety valves may be set by the Chief Engineer at sea, and the results recorded in the log book for review by the Surveyor.

(3) Review of the following records since the last Boiler Survey is to be carried out as part of the survey:
(a) Operation
(b) Maintenance
(c) Repair history
(d) Feedwater chemistry

**2.** For the extension according to **801. 1**, the following survey is to be carried out:

(1) External examination of the boiler
(2) Boiler safety valve relieving gear is to be examined and operationally tested
(3) Boiler protective devices operationally tested
(4) Review of the following records since the last boiler Survey:
(a) Operation
(b) Maintenance
(c) Repair history
(d) Feedwater chemistry

**3.** In addition to the other requirements **Par 1** above(internal examination) in exhaust gas heated economizers of the shell type, all accessible welded joints are to be subjected to a visual examination for cracking. Non-destructive Testing may be required as deemed necessary by the Surveyor. **【See Guidance】**

**4.** The surveys of thermal oil heaters are to be carried out as follows. Where deemed necessary by the Surveyor, further surveys may be required. **【See Guidance】**

(1) The tightness of the installation to flange connections and valves and packings is to be examined.

(2) The coils in the oil fired furnace are to be externally examined.
(3) Plant instrumentation including regulation and safety systems is to be examined and tested.
(4) Liquid relief valves are to be examined, and the pressure is to adjusted.
(5) For thermal oil heater tubes heated by exhaust gas, hydraulic testing to the design pressure is to be carried out.
(6) Fuel oil equipment are to be examined.

### 803. Survey for ships in which boiler condition monitoring is performed【See Guidance】

For ships assigned with the BCM notation in accordance with the Guidance, parts of survey items required in **801.1** may carried out by the chief engineer at alternate surveys. *(2021)*

## Section 9 Continuous Survey of Machinery

### 901. Due range

**1.** At the request of the Owner, and upon approval of the proposed arrangements by the Society, continuous survey of machinery(hereafter referred to as "CMS") may be undertaken for all the items of machinery installations to be surveyed at the Special Survey in accordance with the Guidance relating to the Rules. When such a system is adopted, all the requirements of the Special Survey are to be surveyed in rotation within 5 year period and to be completed.

**2.** CMS is to be carried out at the time of or during the periodical survey. However, at the request of the owner, CMS may be carried out as an Occasional Survey.

### 902. Survey items 【See Guidance】

**1.** The procedure of CMS is to be complied with **Annex 1-7** of the Guidance. *(2021)*

**2.** Where any machinery installations were overhauled and inspected by the Chief Engineer the overhauled inspections may substitute for the CMS in accordance with **Annex 1-7** of the Guidance. However, for ships subject to Korean Ship Safety Act, each part of the main internal combustion engine and internal combustion engine to drive main generator among machinery permissible for the Chief Engineer's inspection, open-up survey by the Surveyor for at least one of two CMS cycles is to be carried. *(2022)*

**3.** If any defects of the CMS is found, further examinations of overhauling are to be carried out where deemed necessary by the Surveyor.

**4.** For passenger ships, the CMS is to be complied with the Guidance relating to the Rules.

**5.** The CMS is to be commenced after the classification of Ships to the Society in accordance with the Guidance relating to the Rules.

**6.** The withdrawal of CMS is to be complied with the requirements of the Guidance relating to the Rules.

### 903. Planned Maintenance System

**1.** At the request of the Owner, where deemed appropriate by the Society in accordance with **Annex 1-8** of the Guidance, the Planned Maintenance System(hereinafter referred to as "PMS") may be applied by the maintenance procedures scheme as an alternative to the Continuous Machinery Survey(CMS). But passenger ships shall not apply to PMS and the Society may consider a special application for PMS on ships exceeding 15 years old based on their condition. However, where deemed necessary by the Surveyor, the overhaul inspection of the equipment may be required. *(2021)* 【See Guidance】

**2.** PMS certificate is to be issued and the inspection based on the PMS may be carried out by the chief engineer certified by this Society. The implementation survey and annual audit are to be in accordance with the requirements of the Guidance relating to the Rules. 【See Guidance】

**3.** In case the ship under PMS, the condition monitoring equipment(hereinafter referred to as "CM"). approved by the Society and Condition Based Maintenance(hereinafter referred to as “CBM”) are to

be in accordance with **Annex 1-8** of the Guidance. *(2021)*

4. The damage and repairs for PMS are to be in accordance with the requirements of the Guidance relating to the Rules. **【See Guidance】**

5. The withdrawal of PMS is to be in accordance with the requirements of the Guidance relating to the Rules. **【See Guidance】**

6. Where there is change of ship management or shipowner, the approved PMS may be reconsidered.

## Section 10 Occasional Survey

### 1001. Occasional Survey *(2022)* 【See Guidance】

All classed ships are to be subjected to Occasional Surveys when they fall under either of the following conditions at the periods other than those of Periodical Survey: *(2022)*

(1) When hull, machinery, fittings or equipment affecting the classification which have been surveyed by the Society, have been damaged, or are about to be repaired or altered. *(2022)*

(2) When whole or a part of machinery are about to be shifted.
(3) When safety valves are opened up or when settings of safety valves is altered.
(4) When propeller shafts are drawn out and the survey of the shaft is requested by the Owner.
(5) When load lines are required to be changed or to be newly marked.
(6) When Laid-up survey. *(2022)*
(7) When the due dates of surveys are to be postponed.
(8) Other cases where surveys are designated or whenever survey is "deemed necessary by the Surveyor". *(2023)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 1** of the Guidance.

### 1002. Items of survey

In the Occasional Surveys, the necessary parts are to be examined in each case of **1001.**

## Section 11 Remote Survey *(2019)*

### 1101. Remote Survey

#### 1. Application *(2023)*

(1) Remote Survey shall be only carried out on the request of the Owner and approved by the flag state administration, and in accordance with the **Guidance for Remote Survey**.

# Section 12 Alteration Survey

## 1201. Alteration survey

All classed ships are to be subjected to survey when hull, machinery, or equipment are about to be altered.

## 1202. Approval of plans

When it is intended to obtain a surveys for alterations, plans and documents equivalent to the survey during construction are to be submitted to the Society for the approval before the work is commenced.

## 1203. Items of survey

1. In the surveys for alterations, the altered parts are to be examined in accordance with the survey items equivalent to the survey during construction.
2. "Where a complete replacement or addition of a major portion of the ship(see Footnote below) is involved at the alteration", the Date of Build(i.e. the year, month and date at which the alteration survey is completed) associated with each altered major portion of the ship shall be indicated, where it has been agreed between the Society and the Owner that the newer structure shall be on a different survey cycle, in the Certificate of Classification in addition to the Date of Build assigned to the ship, and survey requirements for each altered major portion of the ship shall be based on this Date of Build. Such survey due dates may be aligned with ships survey due date at the discretion of the Society. *(2023)*

   Note :

   "Where a complete replacement or addition of a major portion of the ship is involved at the alteration" means the case one or more whole compartments are completely replaced or added, and it is to be applied to this compartment. *(2023)*

   For example, a major portion of the ship may include a complete forward or after section, a complete main cargo section (which may include a complete hold/tank of a cargo ship), a complete block of deck structure of a passenger ship or a structural modification of a single hull to a double hull ship.

# Section 13 Survey of Ships Carrying Dangerous Goods and Other Special Cargoes

## 1301. Surveys *(2023)*

For surveys of ships carrying dangerous goods and other special cargoes, the Society may request to apply, in addition to the Rules, Korean Ship Safety Act, related international conventions and other regulations as deemed appropriate.

Note : The term "other regulations as deemed appropriate" means the following requirements and so on.

1) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk : IBC Code
2) International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk : IGC Code
3) International Maritime Dangerous Goods Code : IMDG Code
4) International Code for the Safe Carriage of Packaged Irradiated Unclear Fuel, Plutonium and High-level Radioactive Wastes on board ships : INF Code

# Section 14 Additional Installations Survey

## 1401. Surveys

The surveys for additional installations(cargo refrigerating installations, cargo handling appliances, automatic and remote control systems, dynamic positioning systems, navigation bridge systems, hull monitoring systems, diving system, high voltage shore connection systems, cargo vapour emission control systems and ballast water management, etc.) are to be carried out in accordance with the requirements specified in **Pt 9**, etc.

# Section 15 Hull Surveys for General Dry Cargo Ships

## 1501. General

### 1. Application

(1) In addition to the other requirements specified in **Ch 2**, the requirements apply to all self-propelled general dry cargo ships of 500 GT and above carrying solid cargoes other than:

- bulk carriers and double skin bulk carriers subject to the enhanced survey programme(ESP)
- dedicated container carriers
- ro-ro cargo ships
- refrigerated cargo ships
- dedicated wood chip carriers
- dedicated cement carriers
- livestock carriers
- deck cargo ship(A ship that is designed to carry cargo exclusively above deck without any access for cargo below deck)
- general dry cargo ships of double side-skin construction, with double side-skin extending for the length of the cargo area, and for the height of the cargo hold to the upper deck(Special consideration may also given to ships that are of double side-skin construction but with single skin in way of several frames e.g. in way of a cargo hold entrance or in way of forebody full form at the forward end of the foremost cargo hold.) (2020)

However, the requirements specified in **1502. 7** and **1504. 7** also apply to those cargo ships, which, although belonging to the ship types listed above that are excluded from the application of this requirements, are fitted with a single cargo hold.

Regarding to the hull surveys for General Dry Cargo Ships, for ships with hybrid cargo hold arrangements, e.g. with some cargo holds of single-side skin and others of double-side skin, the requirements of the **Sec 15** are to be applied only to structure in way of the single-side skin cargo hold region. *(2019)*

(2) The requirements apply to surveys of hull structure and piping systems in way of the following spaces;

(A) cargo holds, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo area
(B) all ballast tanks

(3) The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when substantial corrosion and/or structural defects are found and include additional Close-up Survey “when necessary”. *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

### 3. Procedures for thickness measurements

(1) Follow the procedure for thickness measurement of **Ch 2, Sec 1, 111.** *(2018)*

## 1502. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **201.**

(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, hatch covers, coamings and piping are maintained in a satisfactory condition.

(3) A survey planning meeting is to be held prior to the commencement of the survey. *(2018)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.

(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather deck, hatch covers and coamings

(1) Confirmation is to be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

(2) Where mechanically operated steel covers are fitted, checking the satisfactory condition of:

(a) hatch covers; including Close-up Survey of hatch cover plating

(b) tightness devices of longitudinal, transverse and intermediate cross joints(gaskets, gasket lips, compression bars, drainage channels)

(c) clamping devices, retaining bars, cleating, chain or rope pulleys

(d) guides, guide rails, track wheels and stoppers, etc.

(e) wires, chains, gypsies, tensioning devices

(f) hydraulic system essential to closing and securing

(g) safety locks and retaining devices

(3) Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition where applicable of:

(a) wooden covers and portable beams, carriers or sockets for the portable beam, and their securing devices

(b) steel pontoons

(c) tarpaulins

(d) cleats, battens and wedges

(e) hatch securing bars and their securing devices

(f) loading pads/bars and the side plate edge

(g) guide plates and chocks

(h) compression bars, drainage channels and drain pipes(if any)

(4) Checking the satisfactory condition of hatch coaming plating and their stiffeners including Close-up Survey.

(5) Random checking of the satisfactory operating of mechanically operated hatch covers is to be made including:

(a) stowage and securing in open condition

(b) proper fit and efficiency of sealing in closed condition

(c) operational testing of hydraulic and power components, wires, chains and link drives

Note : For survey of air pipes, flame screens on the open ends of air pipes and ventilations refer to **202. 1** (1) (f) to (h) and (6).

### 4. Suspect areas

Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion.

**Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

### 5. Examination of cargo holds

The examination of cargo holds in Annual Survey is to be in accordance with the follows.

| | 10 years 〈 age ≤ 15 years[3] | 15 years 〈 age[1], [2], [3] |
|---|---|---|
| Overall Survey | · One forward cargo hold (and their associated 'tween deck spaces, where fitted)<br>· One after cargo hold (and their associated 'tween deck spaces, where fitted) | All cargo hold (and their associated 'tween deck spaces, where fitted) |
| Close-up Survey | - | 1. Cargo holds:<br>· one forward lower cargo hold<br>· one other lower cargo hold<br>2. Extent:<br>· Close-up examination of sufficient extent, minimum 25 % of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating |
| Others | - | All piping and penetrations in cargo holds, including overboard piping, are to be examined |

(NOTES)

1) Where the hard protective coating in cargo holds, as applicable, is found to be in GOOD condition, the extent of Close-up Surveys may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

2) Where this level of survey reveals the need for remedial measures, the survey is to be extended to include a Close-up Survey of all of the shell frames and adjacent shell plating of those cargo holds and associated 'tween deck spaces(as applicable) as well as a Close-up Survey of sufficient extent of all remaining cargo holds and 'tween deck spaces(as applicable).

3) When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion.

**Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements is to be carried out before the Annual Survey is credited as completed.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 6. Examination of ballast tanks *(2023)*

Examination of “ballast tanks when required” as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurement is to be carried out.

If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion.

**Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended

thickness measurements are to be carried out before the Annual Survey is credited as completed.

Note : 1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

**7. Additional requirements for single hold cargo ships (See 1501. 1 (1)) after determining compliance with SOLAS II-1/25 *(2020)***

For ships[1] complying with the requirements of SOLAS II-1/25 for hold water level detectors, the Annual Survey is to include an examination and a test, at random, of the water ingress detection system and of their alarms.

Remarks
1) Cargo ships other than bulk carriers having a single cargo hold below the freeboard deck or cargo holds below the freeboard deck which are not separated by at least one bulkhead made water-tight up to the deck and come fall under following (1) or (2) are to be installed relevant systems in accordance with the requirements of **Pt 7 Ch 3, 1403. 3.**

(1) Ships having a length(L) of less than 80 m if constructed on or after 1 July 1998
(2) Ships having a length(L) of less than 100 m if constructed before 1 July 1998

However, the water level detectors required by **1403. 3** need not be fitted in ships fitted with water level detectors complying with the requirements in **1403. 1**, or in ships having suitable width water-tight side compartments each side of the cargo hold length extending vertically at least from inner bottom to freeboard deck.

## 1503. Intermediate Survey

**1. General**

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) A survey planning meeting is to be held prior to the commencement of the survey.

(4) Ships over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **1504.**, except for item 2. 3) in column for Special Survey No. 4 and Subsequent of **Table 1.2.9**. (Caution : In this case, the requirements specified in **403.** are not need to be applied unless specially required in **1504.**)

However, tank testing specified in **1504. 6**, survey of automatic air pipe heads(See Notes in **1504. 1** (6) and **1504. 4** (4)) and internal examination of fuel oil, lube oil and fresh water tanks(See **1504. 4** (1)) are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 6** of the Guidance when requiring the internal examination.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application **401. 4** and **5**.

(c) In lieu of the requirements of **1504. 1** (7), an In-water Survey, according to **604. 1,** may be considered as equivalent.

### 2. Examination of ballast tanks

The examination of ballast tanks in Intermediate Survey is to be in accordance with the follows.

| 5 years < age ≤ 10 years[1), 2), 3)] | 10 years < age ≤ 15 years[1), 3)] | 15 years < age |
|---|---|---|
| · Overall Survey of representative ballast tanks<br>· Survey of suspect areas found at previous surveys in accordance with the requirements specified in **1502. 4.** | · Overall Survey of all ballast tanks<br>· Survey of suspect areas found at previous surveys in accordance with the requirements specified in **1502. 4.** | **1503. 1** (4) to be applied |

(NOTES)

1) If such Overall Survey reveals no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains efficient.

2) Where POOR coating condition, soft or semi-hard coating, corrosion or other defects are found in ballast tanks or where a hard protective coating was not applied from the time of construction, the examination is to be extended to other ballast tanks of the same type.

3) In ballast tanks other than double bottom ballast tanks, where a hard protective coating is found in POOR condition, and it is not renewed, where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined and thickness measurements carried out as "considered necessary" at annual intervals.

   When such breakdown of hard protective coating is found in double bottom ballast tanks, where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied, the tanks in question may be examined at annual intervals. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out.

   Where the term "considered necessary" and "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 3. Examination of cargo holds

The examination of cargo holds in Intermediate Survey is to be in accordance with the follows.

| 5 years < age ≤ 10 years | 10 years < age ≤ 15 years[1)] | 15 years < age |
|---|---|---|
| · Overall Survey of one forward and one after cargo hold(and their associated 'tween deck spaces, where fitted)<br>· Survey of suspect areas found at previous surveys in accordance with the requirements specified in **1502. 4.** | · Overall Survey of all cargo holds(and their associated 'tween deck spaces, where fitted)<br>· Survey of suspect areas found at previous surveys in accordance with the requirements specified in **1502. 4.** | **1503. 1** (4) to be applied |

(NOTES)

1) When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out.

   If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the survey is credited as completed.

   Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

## 1504. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **401.**

(2) A survey planing meeting is to be held prior to the commencement of the survey.

(3) The Special Survey is to include, in addition to the requirements of the Annual Surveys, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in (5), are in a satisfactory condition and is fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(4) All cargo holds, ballast tanks, including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in **Par 5** and **Par 6**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(5) All piping systems within the spaces specified in (4) above are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

(6) The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks. Where the hard protective coating in void space is found to be in a GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2022)*

Note : For survey of automatic air pipe heads refer to **403. 1** (17).

(7) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

However, ships subject to the "Extended Dry-docking Interval System" specified in **605.**, this survey in dry dock can be carried out in accordance with **605.**

### 2. Tank protection

(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined.

For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as “deemed necessary by the Surveyor”. *(2023)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(2) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurements are to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) Where the hard protective coating in tanks is found to be in a GOOD condition, the extent of

Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2020)*

### 3. Hatch covers and coamings

In addition to the requirements in **1502. 3** of the Annual Survey, the following items are to be surveyed.

(1) Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:

(a) stowage and securing in open condition
(b) proper fit and efficiency of sealing in closed condition
(c) operational testing of hydraulic and power components, wires, chains and link drives

(2) Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent is to be carried out.

(3) Close-up Survey and thickness measurement* of the hatch cover and coaming plating and stiffeners are to be carried out as given in **Table 1.2.8** and **Table 1.2.9.**

* Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.

### 4. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces, excluding fuel oil, lube-oil and fresh water tanks, is to be carried out at each Special Survey. *(2020)*

Note : For fuel oil, lube oil and fresh water tanks, reference is to be made to **Table 1.2.3.**

(2) The minimum requirements for Close-up Surveys at Special Surveys are given in **Table 1.2.8.**

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or details which have suffered defects in similar spaces or on similar ships according to available information.

(4) For areas in spaces where hard protective coatings are found in a GOOD condition, the extent of Close-up Surveys according to **Table 1.2.8** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

Note : For examination of automatic air pipe heads, reference is to be made to **Table 1.2.7.**

### 5. Extent of thickness measurement *(2017)*

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.2.9.**

(2) The Surveyor may extend the thickness measurements as “deemed necessary”. When thickness measurements is to be increased to determine the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be sued as guidance for these additional thickness measurements. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) For areas in spaces where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurement according to **Table 1.2.9** may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating. *(2019)*

(4) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements. *(2017)*

### 6. Extent of tank testing

(1) All boundaries of ballast tanks and deep tanks used for water ballast within the cargo length area are to be pressure tested. For fuel oil tanks within the cargo length area, representative tanks are to be pressure tested.

(2) The Surveyor may extend the tank testing as “deemed necessary”. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance.

(3) Tank testing of fuel oil tanks is to be carried out with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be spacially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

**7. Additional Annual Survey requirements for single hold cargo ships (See 1501. 1 (1)) after determining compliance with SOLAS II-1/25** *(2020)*

For ships(Refer to the **1502. 7**) complying with the requirements of SOLAS II-1/25 for hold water level detectors, the Special Survey is to include an examination and a test of the all water ingress detection system and their alarms.

**Table 1.2.8 Minimum requirements for Close-up Survey at Special Survey of General Dry Cargo Ships *(2021)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Selected shell frames in one forward and one aft cargo hold and associated 'tween deck spaces (*1) | 1. Selected shell frames in all cargo holds and 'tween deck spaces (*1) | 1. All shell frames in the forward lower cargo hold and 25 % frames in each of the remaining cargo holds and 'tween deck spaces including upper and lower end attachments and adjacent shell plating (*1) | 1. All shell frames in all cargo holds and 'tween deck spaces including upper and lower end attachments and adjacent shell plating (*1) |
| 2. One selected cargo hold transverse bulkhead (*2) | 2. One transverse bulkhead in each cargo hold (*2) | 2. All cargo hold transverse bulkheads (*2) | 2. All cargo hold transverse bulkheads (*2) |
| | 3. Forward and aft transverse bulkhead in one side ballast tank, including stiffening system (*2) | 3. All transverse bulkheads in ballast tanks, including stiffening system (*2) | 3. All transverse bulkheads in ballast tanks, including stiffening system (*2) |
| | 4. One transverse web with associated plating and framing in two representative ballast tanks of each type (i.e. topside, hopper side, side tank or double bottom tank) (*3) | 4. All transverse webs with associated plating and framing in each ballast tank (*3) | 4. All transverse webs with associated plating and framing in each ballast tank (*3) |
| 3. All cargo hold hatch covers and coamings (plating and stiffeners)(*4) | 5. All cargo hold hatch covers and coamings (plating and stiffeners)(*4) | 5. All cargo hold hatch covers and coamings (plating and stiffeners)(*4) | 5. All cargo hold hatch covers and coamings (plating and stiffeners)(*4) |
| | 6. Selected areas of all deck plating and underdeck structure inside line of hatch openings between cargo hold hatches (*5) | 6. All deck plating and underdeck structure inside line of hatch openings between cargo hold hatches (*5) | 6. All deck plating and underdeck structure inside line of hatch openings between cargo hold hatches (*5) |
| | 7. Selected areas of inner bottom plating (*6) | 7. All areas of inner bottom plating (*6) | 7. All areas of inner bottom plating (*6) |

(NOTES)

1) (*1) to (*6) means as follows and are illustrated for the general drawing for Close-up Survey area in **Annex 1-6, 1** (1) of the Guidance
   (*1) Cargo hold transverse frames
   (*2) Cargo hold transverse bulkhead plating, stiffeners and girders
   (*3) Transverse web frame or watertight transverse bulkhead in ballast tanks
   (*4) Cargo hold hatch covers and coamings. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.
   (*5) Deck plating and underdeck structure inside line of hatch openings between cargo hold hatches
   (*6) Inner bottom plating

2) Close-up Survey of cargo hold transverse bulkheads is to be carried out at the following levels:
   · Immediately above the inner bottom and immediately above the 'tween decks, as applicable
   · Mid-height of the bulkheads for holds without 'tween decks
   · Immediately below the main deck plating and 'tween deck plating

**Table 1.2.9 Minimum requirements for thickness measurements at Special Survey of General Dry Cargo Ships**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas | 1. Suspect areas | 1. Suspect areas | 1. Suspect areas |
| | 2. One transverse section of deck plating in way of a cargo length area within the amidships 0.5 $L$ | 2. Two transverse sections within the amidships 0.5 $L$ in way of two different cargo spaces[2)] | 2. Within the cargo length area:<br>1) A minimum of three transverse sections within the amidships 0.5 $L$[2)]<br>2) Each deck plate outside line of cargo hatch openings<br>3) Each bottom plate, including lower turn of bilge<br>4) Duct keel or pipe tunnel plating and internals |
| | 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.8** | 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.8** | 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.8** |
| | | 4. Within the cargo length area, each deck plate outside line of cargo hatch openings | |
| | | 5. All wind and water strakes within the cargo length area | 4. All wind and water strakes full length |
| | | 6. Selected wind and water strakes outside the cargo length area | |

(NOTES)

1) Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.

2) For ships less than 100 meters in length, the number of transverse sections required at Special Survey No. 3 may be reduced to one and the number of transverse sections at Special Survey No. 4 and subsequent surveys may be reduced to two.

# Section 16 Hull Surveys for Liquefied Gas Carriers

## 1601. General

### 1. Application

(1) In addition to the other requirements specified in **Ch 2**, the requirements apply to all self-propelled ships carrying liquefied gases in bulk.

(2) The requirements apply to surveys of hull structure and piping systems, except piping covered by **204. 3, 304. 3** and **Sec 5-2, 3**, in way of the following spaces;

(A) pump rooms, compressor rooms, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo area
(B) all ballast tanks

Refer to **204. 3, 304. 3** and **Sec 5-2, 3** for periodical surveys of cargo carriage and handling installations

(3) The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when substantial corrosion and/or structural defects are found and include additional Close-up Survey "when necessary". *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

### 3. Procedures for thickness measurements

(1) Follow the procedure for thickness measurement of **Ch 2, Sec 1, 111.** *(2018)*

## 1602. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **201.**
(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition.

(3) A survey planning meeting is to be held prior to the commencement of the survey. *(2018)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.
(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather deck

(1) Examination of flame screens on the open ends of air pipes to all bunker tanks.
(2) Examination of bunker and vent piping systems.

### 4. Examination of cargo pump rooms and compressor rooms and, as far as practicable, pipe tunnels if fitted

(1) Examination of all pump room and compressor room bulkheads for signs of leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room and compressor room bulkheads.

(2) Examination of the condition of all piping systems, except those covered by **204. 3, 304. 3** and **Sec 5-2, 3.**

Note : For survey of air pipes, flame screens on the open ends of air pipes and ventilations refer to **202. 1** (1) (f) to (h) and (6).

### 5. Suspect areas

Suspect areas identified at previous surveys are to be examined.

Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

### 6. Examination of ballast tanks *(2023)*

Examination of "ballast tanks when required" as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurement is to be carried out.

If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

Note : 1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

## 1603. Intermediate Survey

### 1. General

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) A survey planning meeting is to be held prior to the commencement of the survey.

### 2. Examination of ballast tanks

(1) The Overall Survey of ballast tanks in Intermediate Survey is to be in accordance with the follows.

| 5 years 〈 age ≤ 10 years[1), 2), 3)] | 10 years 〈 age[1), 3)] |
|---|---|
| Overall Survey of representative ballast tanks | Overall Survey of all ballast tanks |

(NOTES)

1) If such examinations reveals no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains efficient.

2) If there is no hard protective coating, soft or semi-hard coating or POOR coating condition, the examination is to be extended to other ballast tanks of the same type.

3) For ballast tanks, excluding double bottom ballast tanks, if there is no hard protective coating, soft or semi-hard coating, or POOR coating condition and it is not renewed, the tanks in question are to be internally examined at annual intervals.

4) When such conditions as above 3) are found in double bottom ballast tanks, the tanks in question may be internally examined at annual intervals.

(2) The minimum requirements for Close-up Survey of ballast tanks in Intermediate Survey is to be in accordance with the follows.

| 10 years 〈 age ≤ 15 years | 15 years 〈 age |
|---|---|
| Close-up Survey of:<br>1. all web frames and both transverse bulkheads in a representative ballast tank (*1) and (*2)<br>2. the upper part of one web frame in another representative ballast tank<br>3. one transverse bulkhead in another representative ballast tank (*2) | Close-up Survey of:<br>1. all web frames and both transverse bulkheads in two representative ballast tanks (*1) and (*2) |
| (NOTES)<br>1) (*1) and (*2) mean as follows;<br>(*1) : Complete transverse web frame including adjacent structural members<br>(*2) : Transverse bulkhead complete, including girder system and adjacent structural members, and adjacent longitudinal bulkhead structure<br>2) Ballast tanks include topside, double hull side, double bottom, hopper side, or any combined arrangement of the aforementioned, and peak tanks where fitted.<br>3) For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of Close-up Surveys may be reduced by sufficiently confirming the actual average condition of the structure under the coating by the Society. *(2019)*<br>4) For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of Close-up Surveys may be reduced by sufficiently confirming the actual average condition of the structure under the coating by the Society. *(2019)*<br>5) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:<br>- in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar ships according to available information;<br>- in tanks having structures approved with reduced scantlings. | |

## 1604. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **401.**

(2) A survey planing meeting is to be held prior to the commencement of the survey.

(3) The Special Survey is to include, in addition to the requirements of the Annual Surveys, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in (5), are in a satisfactory condition and is fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(4) Ballast tanks, including double bottom tanks, pump rooms, compressor rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in **Par 4** and **Par 5**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(5) All piping systems within the spaces specified in (4) above, except those covered by **204. 3, 304. 3** and **Sec 5-2, 3**, are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

(6) The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks.

Where the hard protective coating in void space is found to be in a GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2022)*

Note : For survey of automatic air pipe heads refer to **403. 1** (17).

(7) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the ballast tanks are considered to be the parts below light ballast water line.

However, ships subject to the "Extended Dry-docking Interval System" specified in **605.**, this survey in dry dock can be carried out in accordance with **605.** *(2024)*

## 2. Tank protection

(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined.

For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as “deemed necessary by the Surveyor”. *(2023)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(2) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurements are to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) Where the hard protective coating in ballast tanks is found to be in a GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

## 3. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces, excluding fuel oil, lube-oil and fresh water tanks, is to be carried out at each Special Survey. *(2020)*

Note : For fuel oil, lube oil and fresh water tanks, reference is to be made to **Table 1.2.3.**

(2) The minimum requirements for Close-up Surveys at Special Surveys are given in **Table 1.2.10.**

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and where tanks have structural arrangements or details which have suffered defects in similar spaces or on similar ships according to available information.

(4) For areas in tanks where hard protective coatings are found in a GOOD condition, the extent of Close-up Surveys according to **Table 1.2.10** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

Note : For examination of automatic air pipe heads, reference is to be made to **Table 1.2.7.**

**4. Extent of thickness measurement**

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.2.11.**

(2) The Surveyor may extend the thickness measurements as "deemed necessary".

When thickness measurements indicate substantial corrosion, the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used as guidance for these additional thickness measurements. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurement according to **Table 1.2.11** may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating. *(2019)*

(4) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

**5. Extent of tank testing**

(1) All boundaries of ballast tanks and deep tanks used for water ballast within the cargo area are to be pressure tested. For fuel oil tanks within the cargo length area, representative tanks are to be pressure tested.

(2) The Surveyor may extend the tank testing as "deemed necessary". *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance.

(3) Tank testing of fuel oil tanks is to be carried out with a head of liquid to the highest point that liquid will rise under service conditions.

Tank testing of fuel oil tanks may be spacially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

**Table 1.2.10 Minimum requirements for Close-up Survey at Special Survey of Liquefied Gas Carriers**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 and Subsequent |
|---|---|---|
| 1. One web frame in a representative ballast tank of the topside, hopper side and double hull side type (*1) | 1. All web frame in a ballast tank, which is to be a double hull side tank or a topside tank. If such tanks are not fitted, another ballast tank is to be selected. (*1) | 1. All web frames in all ballast tanks (*1) |
| 2. One transverse bulkhead in a ballast tank (*3) | 2. One web frame in each remaining ballast tank (*1)<br>3. One transverse bulkhead in each ballast tank (*2) | 2. All transverse bulkheads in all ballast tanks (*2) |

(NOTES)

1) (*1) to (*3) mean as follows and the typical midship sections of liquefied gas carriers are illustrated in **Annex 1-6 of the Guidance.**

(*1) : Complete transverse web frame including adjacent structural members
(*2) : Transverse bulkhead complete, including girder system and adjacent structural members, and adjacent longitudinal bulkhead structure

(*3) : Transverse bulkhead lower part including girder system and adjacent structural members

2) Ballast tanks include topside, double hull side, double bottom, hopper side, or any combined arrangement of the aforementioned, and peak tanks where fitted.

3) For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of Close-up Surveys may be reduced by sufficiently confirming the actual average condition of the structure under the coating by the Society. *(2019)*

4) For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of Close-up Surveys may be reduced by sufficiently confirming the actual average condition of the structure under the coating by the Society. *(2019)*

5) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

- in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar ships according to available information;
- in tanks having structures approved with reduced scantlings.

**Table 1.2.11 Minimum requirements for thickness measurements at Special Survey of Liquefied Gas Carriers**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas | 1. Suspect areas | 1. Suspect areas | 1. Suspect areas |
| 2. One section of deck plating for the full beam of the ship within 0.5 $L$ amidships in way of a ballast tank, if any | 2. Within the cargo area:<br>1) Each deck plate<br>2) One transverse section within 0.5 $L$ amidships in way of a ballast tank, if any | 2. Within the cargo area:<br>1) Each deck plate<br>2) Two transverse sections[1]<br>3) All wind and water strakes | 2. Within the cargo area:<br>1) Each deck plate<br>2) Three transverse sections[1]<br>3) Each bottom plate<br>4) Duct keel plating and internals |
| | 3. Selected wind and water strakes outside the cargo area | 3. Selected wind and water strakes outside the cargo area | 3. All wind and water strakes, full length |
| 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.10** | 4. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.10** | 4. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.10** | 4. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey according to **Table 1.2.10** |

(NOTES)

1) At least one section is to include a ballast tank within 0.5 $L$ amidships, if any.

2) For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of thickness measurements may be increased to include the tank top plating at the discretion of the Surveyor.

Where the Surveyor is to consider the cases specified in **Ch 1, 801. 3** of the Guidance when require to increase the thickness measurements. *(2023)*

3) For areas in spaces where hard protective coatings are found to be in GOOD condition, the extent of thickness measurements may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating by the Society. *(2019)*

4) The Surveyor may extend the thickness measurements as **"**deemed necessary**"**. Where substantial corrosion is found, the extent of thickness measurements is to be increased to the satisfaction of the Surveyor.

Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

# Section 17 Survey Requirements for Shell and Inner Doors, Etc. of RoRo Ships

## 1701. General

### 1. Application

In addition to the other requirements specified in **Ch 2**, these requirements are applicable to the survey of bow, inner, side shell and stern doors of RoRo passenger(Ro-Pax) and RoRo cargo ships, to the extent appropriate to the arrangement and equipment of each ship.

### 2. Definitions

(1) **RoRo ship** is a ship which utilizes a loading ramp to enable wheeled vehicles to be rolled-on and rolled-off the ship.

(2) **RoRo passenger ship**(Ro-Pax) is a passenger ship with RoRo spaces or special category spaces.

(3) **RoRo spaces** are spaces not normally sub-divided in any way and normally extending to either a substantial length or the entire length of the ship, in which motor vehicles with fuel in their tanks for their own propulsion and/or goods(packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or, other receptacles) can be loaded and unloaded normally in a horizontal direction.

(4) **Special category spaces** are those enclosed vehicle spaces above or below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

(5) **Securing device** is a device used to keep the door closed by preventing it from rotating about its hinges.

(6) **Supporting device** is a device used to transmit external or internal loads from the door to a securing device and from the securing device to the ship's structure, or a device other than a securing device, such as a hinge, stopper or other fixed device, that transmits loads from the door to the ship's structure.

(7) **Locking device** is a device that locks a securing device in the closed position.

**3.** Examples of typical bow, inner, side shell and stern doors are illustrated in **Annex 1-14** of the Guidance.

## 1702. Annual Survey

**1.** The survey is to consist of an examination to verify, as far as is practicable, that the bow, inner, side shell and stern doors are maintained in a satisfactory condition.

**2.** Confirmation is to be obtained that no unapproved changes have been made to the bow, inner, side shell and stern doors since the last survey.

### 3. Documents

If an Operating and Maintenance Manual(OMM) is required, it is to be verified that an approved copy is on board and any possible modifications are included. It is to be verified that documented operating procedures for closing and securing doors are kept on board and posted at an appropriate place.

The Surveyor shall examine the OMM with special attention to the register of inspections and its contents as a basis for the survey.

### 4. Structural examination *(2021)*

Bow, inner, side shell and stern doors are to be examined with particular attention paid to:

(1) Structural arrangement of doors including plating, secondary stiffeners, primary structure, hinging arms and welding;

(2) Shell structure surrounding the opening of the doors and the securing, supporting and locking devices including shell plating, secondary stiffeners, primary structure, and welding;

(3) Hinges and bearings, thrust bearings;
(4) Hull and door side supports for securing, supporting and locking devices;
(5) Close-up Survey of securing, supporting and locking devices including welding, refer to **Table 1.2.12**.

Whenever a crack is found, an examination with NDT is to be carried out in the surrounding area and for "similar items as considered necessary by the Surveyor".

Note : The term "similar items as considered necessary by the Surveyor" means the items where similar crack is suspect because their structure or arrangement is similar to those the crack is found. *(2021)*

**5. Measurement of clearances**

Clearances of hinges, bearings and thrust bearings are to be taken, where no dismantling is required. Where the function test is not satisfactory, dismantling may be required to measure the clearances. If dismantling is carried out, a visual examination of hinge pins and bearings together with NDT of the hinge pin is to be carried out. Clearances of securing, supporting and locking devices are to be measured, where indicated in the OMM.

**6. Sealing arrangement**

An examination of packing material/rubber gaskets and retaining bars or channels, including welding is to be carried out.

**7. Drainage arrangement**

An examination of drainage arrangement, including bilge wells and drain pipes is to be carried out, where fitted. A test of the bilge system between the inner and outer doors is to be carried out.

**8. Function test of doors**

Checking of the satisfactory operation of the bow, inner, side shell and stern doors during a complete opening and closing operation is to be made, as applicable, including:

(1) Proper working of the hinging arms and hinges;
(2) Proper engagement of the thrust bearings;
(3) Device for locking the door in the open position;
(4) Securing, supporting and locking devices;
(5) Proper sequence of the interlock system for the opening/closing system and the securing and locking devices;

(6) Mechanical lock of the securing devices;
(7) Proper locking of hydraulic securing devices in the event of a loss of the hydraulic fluid, according to the procedure provided by the OMM;

(8) Correct indication of open/closed position of doors and securing/locking devices at navigation bridge and other control stations;

(9) Isolation of the hydraulic securing/locking devices from other hydraulic systems;
(10) Confirmation that the operating panels are inaccessible to unauthorized persons;

(11) Verification that a notice plate giving instructions to the effect that all securing devices are to be closed and locked before leaving harbour is placed at each operating panel and supplemented by warning indicator lights;

(12) Examination of electrical equipment for opening, closing and securing the doors.

**9. Function test of indicator system**

Checking of the satisfactory operation of the indicator system, where fitted, is to be carried out, as applicable, including:

(1) Proper visible indication and audible alarm on the navigation bridge panel, according to the selected function "harbour/sea voyage" and on the operating panel;
(2) Lamp test function on both panels;
(3) Verification that it is not possible to turn off the indicator light on both panels;
(4) Verification of fail safe performance, according to the procedure provided by the OMM;
(5) Confirmation that power supply for indicator system is supplied by the emergency source or other secure power supply and independent of the power supply for operating the doors;

(6) Proper condition of sensors and protection from water, ice formation and mechanical damage.

**10. Test of water leakage detection system**

Where fitted, the water leakage detection system is to be tested including proper audible alarm on the navigation bridge panel and on the engine control room panel, according to the procedure provided by the OMM.

**11. Test of television surveillance system**

Where fitted, the television surveillance system is to be tested including proper indication on the navigation bridge monitor and on the engine control room monitor.

**12. Tightness test *(2023)***

A hose test or equivalent is to be carried out. If the visual examination and function test have shown satisfactory results, the tightness test of shell doors on RoRo cargo ships need not be carried out unless considered necessary by the attending Surveyor.

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 1** of the Guidance when requiring the tightness test.

**13. NDT and Thickness Measurements *(2023)***

When “considered necessary by the Surveyor”, NDT and thickness measurements may be required after visual examination and function test.

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 2** and/or **3** of the Guidance.

**Table 1.2.12 Minimum requirements for Close-up Survey of doors, locking, securing and supporting devices and fittings**

The following is a list of the devices and fittings and associated welding to be subject to Close-up Survey by the attending Surveyor.

| |
|---|
| Cylinder securing pins, supporting brackets, back-up brackets(where fitted) and their welded connections |
| Hinge pins, supporting brackets, back-up brackets(where fitted) and their welded connections |
| Locking hooks, securing pins, supporting brackets, back-up brackets(where fitted) and their welded connections |
| Locking pins, supporting brackets, back-up brackets(where fitted) and their welded connections |
| Locating and stopper devices and their welded connections |

## 1703. Special Survey

**1.** The Special Survey is to include, in addition to the requirements of the Annual Survey as required in **1702.**, examination, tests and checks of sufficient extent to verify that the bow, inner, side shell and stern doors, are in satisfactory condition and considered able to remain in compliance with applicable requirements, subject to proper maintenance and operation in accordance with the Operation and Maintenance Manual(OMM) or manufacturer's recommendations and the periodical surveys being carried out at the due dates for the five year period until the next Special Survey.

**2.** The examinations of the doors are to be supplemented by thickness measurements and testing to verify compliance with applicable requirements so that the structural and weathertight integrity remain effective.

The aim of the examination is to identify corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

**3.** The bow, inner, side shell and stern doors are to be surveyed as follows:

(1) A survey of the items listed in **1702. 4**, including Close-up Survey of securing, supporting and locking devices, together with welding, is to be carried out, refer to **Table 1.2.12**.

(2) Non-destructive testing and thickness measurements are to be carried out on securing, supporting and locking devices, including welding, to "the extent considered necessary by the Surveyor"[1].

Whenever a crack is found, an examination with NDT is to be carried out in the surrounding area and for "similar items as considered necessary by the Surveyor"[2]. *(2021)*

Note [1] The term "the extent considered necessary by the Surveyor" means the securing, supporting and locking devices which have substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect.

[2] The term "similar items as considered necessary by the Surveyor" means the items where similar crack is suspect because their structure or arrangement is similar to those the crack is found.

(3) The maximum thickness diminution of hinging arms, securing, supporting and locking devices is to be in accordance with the requirements specified by the Society for primary structures, but is not to be more than 15% of the as-built thickness or "the maximum corrosion allowance of the Society", whichever is less. Certain designs may be subject to the Society's special consideration. *(2021)*

Note : "the maximum corrosion allowance of the Society" is to be comply with the requirements specified by the maker.

(4) Checking the effectiveness of sealing arrangements by hose testing or equivalent is to be carried out.

(5) Clearances of hinges, bearings and thrust bearings are to be taken. Unless otherwise specified in the OMM or by manufacturer's recommendation, the measurement of clearances on RoRo cargo ships may be limited to representative bearings where dismantling is needed in order to measure the clearances. If dismantling is carried out, a visual examination of hinge pins and bearings together with NDT of the hinge pin is to be carried out.

(6) The non-return valves of the drainage system are to be dismantled and examined.

# Section 18 Additional Requirements

## 1801. Strength and securing of small hatches, fittings and equipment on the fore deck

1. Ships that are described in **Pt 4, Ch 9, 101. 1** that are contracted for construction on or after 1 January 2004 are to comply with the requirements specified in **Pt 4, Ch 9** by the time of delivery.

2. Ships described in **Pt 4, Ch 9, 101. 2** that are contracted for construction prior to 1 January 2004 are to comply with the requirements specified in **Pt 4, Ch 9.**

   (1) For ships which will be 15 years of age or more on 1 January 2004 by the due date of the first Intermediate or Special Survey after that date;

   (2) For ships which will be 10 years of age or more on 1 January 2004 by the due date of the first Special Survey after that date;

   (3) For ships which will be less than 10 years of age on 1 January 2004 by the date on which the ship reaches 10 years of age.

3. Ships described in **Pt 4, Ch 9, 101.**, contracted for construction prior to 1 July 2007, are to comply with the requirements specified in **Pt 4, Ch 9, 201.** of the Guidance relating to the Rules by the relevant compliance date specified in **Par 1** or **Par 2** above, or by the due date of the first Special Survey after 1 July 2007, whichever is later. Completion prior to 1 July 2007 of a Special Survey with a due date after 1 July 2007 cannot be used to postpone compliance.

## 1802. Water level detectors on single hold cargo ships other than bulk carriers

Among the ships subject to the requirements specified in **Pt 7, Ch 3, 1402. 2,** ships constructed before 1 January 2007 shall comply with the requirements specified in **Pt 7, Ch 3, 1403. 3** not later than the date of the first Intermediate or Special Survey of the ship to be carried out after 1 January 2007, whichever comes first, but not later than 31 December 2009.

# Section 19 Special Requirements for Ships Subject to Korean Ship Safety Act or Fishing Vessels Act

## 1901. Special requirements for ships subject to Korean Ship Safety Act 【See Guidance】

**1.** In application to **202. 2**(Fire-extinguishing appliances at Annual Survey), **302. 2**(Fire-extinguishing appliances at Intermediate Survey) and **404.**(Fire-extinguishing appliances at Special Survey), the survey for fire-extinguishing appliances is to be in accordance with the relevant requirements of *Korean Ship Safety Act*.

**2.** In application to **203.**(Machinery, electrical installations and additional installations at Annual Survey), insulation resistance test and performance test of electrical installations are to be made. These tests may be dispensed with, where it is found that the measured records of insulation resistance remain efficient and they comply with the requirements specified in **Pt 6, Ch 1, 1701. 1.** However, insulation resistance test and performance test of electrical installations are not to be dispensed with for passenger ships employed to domestic voyage. *(2017)*

**3.** In application to **301.**(Due range of Intermediate Survey), Intermediate Surveys as per Sec. 3 and Docking Survey(In-water Survey not to be allowed) for Ships of 24m in length and above and 30 years of age and over after launching date are to be carried out within 3 months before or after each anniversary date. *(2020)*

**4.** At the Intermediate Survey according to **Par 3** above, the following relevant requirements are applied only at the Intermediate Survey carried out within 3months before or after the second or third anniversary date from the completion date of the previous Special Survey in accordance with **301**(Due range of Intermediate Survey). *(2020)*

(1) **1503.** (Intermediate Hull Survey of General Dry Cargo Ships)
(2) **1603.** (Intermediate Hull Survey of Liquefied Gas Carrier)
(3) **Ch 3, 201. 1** (3), (4), (6) and **203.** (General and Intermediate Hull Survey of Bulk Carriers)
(4) **Ch 3, 303.** (Intermediate Hull Survey of Oil Tankers)
(5) **Ch 3, 403.** (Intermediate Hull Survey of Chemical Tankers)
(6) **Ch 3, 503.** (Intermediate Hull Survey of Double Hull Oil Tankers)
(7) **Ch 3, 603.** (Intermediate Hull Survey of Double Skin Bulk Carriers)

**5.** At the Intermediate Survey according to **Par 3** above, the surveys in **303.**(Machinery, electrical installations and additional installations at Intermediate Survey) **Par 1** to **Par 4** are applied only at the Intermediate Survey carried out within 3 months before or after the second or third anniversary date from the completion date of the previous Special Survey in accordance with **301.**

**6.** In application to **303. 2.** (2) and **502. 1.** (1), the due date of examinations/overhauling survey for internal combustion engines, which are installed on ships engaged on domestic voyage only, is to be in accordance with the relevant requirements of Korean Ship Safety Act. *(2022)*

**7.** In case of ships's age 15 years and over, docking survey is not to be replaced by In-water Survey at Intermediate Survey. *(2021)*

**8.** In application to **303.**(Machinery, electrical installations and additional installations at Intermediate Survey), spare parts for ships are to be examined.

**9.** According to the Classification Technical Rules, Oil Tanker carrying oil in independent tanks not part of ship's hull such as an asphalt carrier does not fall within the scope of the Enhanced Survey Programme(ESP). But this ship above subject to the 「Korean Ship Safety Act」 is classified as Oil Tankers and the 「Standard for Enhanced Survey」 is applied, Therefore this ship is to be subject to the Enhanced Survey. *(2021)*

**10.** In application to **Ch 3 Sec 1 101. 2.**(Procedural requirements for certain ESP Survey), on duoble skin bulk carriers and oil tankers 100,000DWT and above at the intermediate hull classification survey between 10 and 15 years of age, the survey of hull structure and piping system to which these requirements applies is to be performed by two at least exclusive Surveyors, where substantial corrosion and/or structural defects are found. *(2019)*

**11.** In application to **Pt 9, Ch 2**(Cargo handling appliances), the cargo handling appliances, except cargo ramps, of safe working load not less than 1 ton are to be included. *(2019)*

## 1902. Special requirements for ships subject to Korean Fishing Vessels Act

**1.** Vessels subject to the Korean Fishing Vessels Act shall apply the relevant laws. And the following **2.** to **9**. should be applied. *(2020)*

**2.** When a Korean flagged Deep-Sea Fishing Vessel(except for factory ship or carrier) approved for pelagic fishing by the Korean Government, at the time of Annual or Intermediate Survey, is not at the location where the survey can be taken due to the fishing operation in foreign waters, the relevant survey may be postponed within 12 months from the anniversary date through the approval of the Society.

**3.** For fishing vessels of 24 m in length and above and less than 5 years of age after launching date, Annual Surveys for statutory survey of Korean Government may be omitted. *(2021)*

**4.** The extends and method of thickness measurement, wear limit, measures and records of the results of thickness measurement, etc. shall be carried out in accordance with Article 55, Clauses 2, and 3 of the Enforcement Decree of Fishing Vessels Act and Attached Table No. 14 of it. *(2019)*

**5.** For fishing vessels of 24 m in length and above and 30 years of age and over after launching date, the requirements for thickness measurements at Intermediate Survey are to be the same extent as the previous Special Survey.

**6.** In application to **203., 303.** and **502.**(Machinery, electrical installations and additional installations at Annual Survey, Intermediate Survey and Special Survey), insulation resistance test and performance test of electrical installations are to be made.

**7.** In case of ships's age 15 years and over, docking survey is not to be replaced by In-water Survey at Intermediate Survey. *(2021)*

**8.** In application to **303.**(Machinery, electrical installations and additional installations at Intermediate Survey), for engines specified in **303. 2** and **3**, operation test of alarms and safety devices is to be made. However, this test may be omitted for an engine which is installed onboard within less than 5 years.

**9.** In application to **Pt 9, Ch 2**(Cargo handling appliances), for the ships not less than 300 gross tonnage, the cargo handling appliances of safe working load not less than 1 ton are to be included. *(2019)* ⚓

# CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME

## Section 1 General

### 101. Application

1. In addition to the requirements specified in **Ch 2,** these requirements apply to hull surveys of ships subject to the enhanced survey programme such as **bulk carriers, oil tankers** and **chemical tankers,** etc.

2. **Procedural requirements for certain ESP surveys**

The objective of these requirements are to improve the quality of surveys. These requirements apply to surveys of hull structures and piping systems in way of cargo holds and/or cargo tanks, cofferdams, cargo pump rooms, pipe tunnels, void spaces, within the cargo length area and all ballast tanks. In the case of Bulk Carriers, selected fuel oil tanks within the cargo length area might be part of the areas to be surveyed according to the applicable provisions of the **Ch 3, Sec. 2** Bulk Carriers or **Ch 3, Sec. 6** Double Skin Bulk Carriers.

Taking in to consideration, the size of vessels and scope of surveys for vessels noted below, it is more effective to have more than one Surveyor examine the required spaces, holds or tanks and to provide mutual support and consultation during the surveys in recommending repairs and actions required for Conditions of Class. *(2020)*

(1) On ships 20,000 DWT and above, subject to ESP, starting with Special Survey No. 3, at special and intermediate hull classification surveys, the survey of hull structure and piping systems to which these requirements applies is to be carried out by at least two exclusive Surveyors.

On bulk carriers 100,000 DWT and above of single side skin construction at the intermediate hull classification survey between 10 and 15 years of age, the survey of hull structure and piping systems to which these requirements applies is to be performed by two at least exclusive Surveyors. *(2017)*

(2) This requires that at least two exclusive Surveyors attend on board at the same time to perform the required survey(this also applies to voyage surveys).

Where compatible with relevant laws and regulations, on dual class vessels, the requirement for two Surveyors may be fulfilled by having one Surveyor attend from each Society. *(2020)*

(3) Though each attending Surveyor is not required to perform all aspects of the required survey, they are required to consult with each other and to do joint Overall and Close-up Surveys to the extent necessary to determine the condition of the vessel areas to which these requirements applies.

The extent of these surveys should be sufficient for the Surveyors to agree on actions required to complete the survey with respect to renewals, repairs, and other Conditions of Class. Each Surveyor is required to co-sign the survey report or indicate their concurrence in an equivalent manner. *(2020)*

(4) The following surveys may be witnessed by a single Surveyor;

- Thickness measurements in accordance with **Ch 2, 111**. of the Rules
- Tank testing in accordance with the applicable **Ch 3** of the Rules
- Repairs carried out in association with intermediate and special hull classification survey, the extent of which have been agreed upon by the required two Surveyors during the course of the surveys

(5) Surveyors used to fulfill this requirements are to be qualified in the survey processes involved.

(6) The onboard attendance of the Surveyors is to be documented according to the separate requirements specified by the Society.

## 102. Preparations for survey

### 1. Survey programme

(1) The Owner in cooperation with the Society is to work out a specific survey programme prior to the commencement of any part of:

- the Special Survey
- the Intermediate Survey for ships subject to the enhanced survey programme over 10 years of age.

The survey programme is to be in a written format, based on the information in **Annex 1-3, Table 1** of the Guidance. The survey is not to commence until the survey programme has been agreed.

The survey programme at Intermediate Survey may consist of the survey programme at the previous Special Survey supplemented by the executive hull summary of that Special Survey and later relevant survey reports. The survey programme is to be worked out taking into account any amendments to the survey requirements implemented after the last Special Survey carried out.

Prior to the development of the survey programme, the survey planning questionnaire is to be completed by the Owner based on the information set out in **Annex 1-3, Table 2** of the Guidance, and forwarded to the Society.

(2) In developing the survey programme, the following documentation is to be collected and consulted with a view to selecting cargo holds/tanks, tanks, areas, and structural elements to be examined:

(A) Bulk carriers and double skin bulk carriers
(a) Survey status and basic ship information
(b) Documentation on-board, as described in **103. 2** and **3**
(c) Main structural plans(scantling drawings), including information regarding use of high tensile steels(HTS)
(d) Relevant previous survey and inspection reports from both the Society and the Owner
(e) Information regarding the use of the ship's holds and tanks, typical cargoes and other relevant data
(f) Information regarding corrosion prevention level on the new building
(g) Information regarding the relevant maintenance level during operation

(B) Oil tankers, chemical tankers and double hull oil tankers
(a) Survey status and basic ship information
(b) Documentation on-board, as described in **103. 2** and **3**
(c) Main structural plans of cargo and ballast tanks(scantling drawings), including information regarding use of high tensile steels(HTS), clad steel and stainless steel(for chemical tankers)
(d) Executive hull summary
(e) Relevant previous damage and repair history
(f) Relevant previous survey and inspection reports from both the Society and the Owner
(g) For oil tankers and double hull oil tankers cargo and ballast history for the last 3 years, including carriage of cargo under heated conditions, for chemical tankers information regarding the use of the ship's tanks, typical cargoes and other relevant data
(h) Details of the inert gas plant and tank cleaning procedures
(i) Information and other relevant data regarding conversion or modification of the ship's cargo and ballast tanks since the time of construction
(j) Description and history of the coating and corrosion prevention system, if any
(k) Inspections by the Owner's personnel during the last 3 *years* with reference to structural deterioration in general, leakages in tank boundaries and piping and condition of the coating and corrosion prevention system, if any. Guidance for reporting is shown in **Annex 1-4** "Owners Inspection Report" *(2019)*
(l) Information regarding the relevant maintenance level during operation including port state control reports of inspection containing hull related deficiencies, Safety Management System non-conformities relating to hull maintenance, including the associated corrective action(s)
(m) Any other information that will help identify suspect areas and critical structural areas

(3) The submitted survey programme is to include relevant information including at least:

(A) Bulk carriers and double skin bulk carriers

(a) Basic ship information and particulars
(b) Main structural plans(scantling drawings), including information regarding use of high tensile steels(HTS)
(c) Plan of tanks and holds
(d) List of tanks and holds with information on use, protection and condition of coating
(e) Conditions for survey(e.g., information regarding hold and tank cleaning, gas freeing, ventilation, lighting, etc.)
(f) Provisions and methods for access to structures
(g) Equipment for surveys
(h) Nomination of hold and tanks and areas for Close-up Survey
(i) Nominations of sections and areas for thickness measurement
(j) Nomination of tanks for tank pressure testing
(k) Damage experience related to the ship in question

(B) Oil tankers, chemical tankers and double hull oil tankers

(a) Basic ship information and particulars
(b) Main structural plans of cargo and ballast tanks(scantling drawings), including information regarding use of high tensile steels(HTS), clad steel and stainless steel(for chemical tankers)
(c) Arrangement of tanks
(d) List of tanks with information on their use, extent and condition of coatings and corrosion prevention systems
(e) Conditions for survey(e.g., information regarding tank cleaning, gas freeing, ventilation, lighting, etc.)
(f) Provisions and methods for access to structures
(g) Equipment for surveys
(h) Nomination of tanks and areas for Close-up Survey
(i) Nomination of areas and sections for thickness measurement
(j) Nomination of tanks for tank pressure testing and the pipes that are to undergo pipe pressure testing as per **404. 6** (for chemical tankers)
(k) Identification of the thickness measurement firm *(2019)*
(l) Damage experience related to the ship in question
(m) Critical structural areas and suspect areas, where relevant

(4) The Society will advise the Owner of the maximum acceptable structural corrosion diminution levels applicable to the vessel.

(5) Use may also be made of the process contained in **Annex 1-3, Par 1** of the Guidance in conjunction with the preparation of the required survey programme. This process is a recommended tool which may be invoked at the discretion of the Society, “when considered necessary and appropriate”. *(2021)*

Note : The term "when considered necessary and appropriate" means the cases where it may assist in identifying critical structural areas, nomination suspect areas and in focus ing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage.

## 2. Conditions for survey

(1) The Owner is to provide the necessary facilities for a safe execution of the survey.

(A) In order to enable the attending Surveyors to carry out the survey, provisions for proper and safe access are to be agreed between the Owner and the Society and are to be in accordance with IACS PR No.37(Procedural Requirement for Confined Space Safe Entry).

(B) Details of the means of access are to be provided in the survey planning questionnaire.

(C) In cases where the provisions of safety and required access are judged by the attending Surveyor(s) not to be adequate, the survey of the spaces involved is not to proceed.

(2) Spaces(including cargo holds and tanks) are to be safe for access. Spaces(including cargo holds and tanks) are to be gas free and properly ventilated. Prior to entering a tank, void or enclosed space, it is to be verified that the atmosphere in that space is free from hazardous gas and contains sufficient oxygen. *(2020)*

(3) In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces are to be cleaned including removal from surfaces of all loose accumulated corrosion scale. Spaces are to 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) Sufficient illumination is to be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.

(5) Where soft or semi-hard coatings have been applied, safe access is to 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 or semi-hard coating is to be removed.

### 3. Access to structures

(1) For Overall Survey, means are to be provided to enable the Surveyor to examine the hull structure in a safe and practical way.

(2) For Close-up Survey(for bulk carriers(except double skin bulk carriers), Close-up Survey of the hull structure, other than cargo hold shell frames), one or more of the following means for access, acceptable to Surveyor, is to be provided:

(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
(E) portable ladders
(F) other equivalent means

(3) For Close-up Surveys of the cargo hold shell frames of bulk carriers(except double skin bulk carriers) less than 100,000 DWT, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

(A) permanent staging and passage through structures
(B) temporary staging and passage through structures
(C) portable ladder restricted to not more than 5 m 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 is sufficient to withstand static loads at all levels of water
(F) other equivalent means

(4) For Close-up Surveys of the cargo hold shell frames of bulk carriers(except double skin bulk carriers) 100,000 DWT and above, the use of portable ladders is not accepted, and one or more of the following means for access, acceptable to the Surveyor, is to be provided:

(A) Annual Surveys, Intermediate Survey under 10 years of age and Special Survey No. 1
  (a) permanent staging and passage through structures
  (b) temporary staging and passage through structures
  (c) hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms
  (d) boats or rafts provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water
  (e) other equivalent means

(B) Subsequent Intermediate Surveys and Special Surveys

(a) either permanent or temporary staging and passage through structures for Close-up Survey of at least the upper part of hold frames

(b) hydraulic arm vehicles such as conventional cherry pickers for surveys of lower and middle part of shell frames as alternative to staging

(c) lifts and movable platforms

(d) boats or rafts provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water

(e) other equivalent means

Notwithstanding the above requirements: *(2019)*

(a) 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 examination of sufficient extent, minimum 25 % of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating of the forward cargo hold" at Annual Survey, required in **202. 4**(10 *years* < age ≤ 15 *years*, Close-up Survey), and the "one other selected cargo hold" required in **202. 4**(15 *years* ≤ age, Close-up Survey). *(2019)*

(b) The use of hydraulic arm vehicles or aerial lifts ("Cherry picker") may be accepted by the attending surveyor for the close-up survey of the upper part of side shell frames or other structures in all cases where the maximum working height is not more than 17 m. *(2019)*

**4. Equipment for survey**

(1) Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required.

(2) One or more of the following fracture detection procedures may be required if "deemed necessary by the Surveyor": *(2023)*

(A) radiographic equipment
(B) ultrasonic equipment
(C) magnetic particle equipment
(D) dye penetrant

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 2** of the Guidance.

(3) Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles together with instructions and guidance on their use are to be made available during the survey. A safety check-list is to be provided.

(4) Adequate and safe lighting is to be provided for the safe and efficient conduct of the survey.

(5) Adequate protective clothing is to be made available and used during the survey(e.g. safety helmet, gloves, safety shoes, etc.).

**5. Rescue and emergency response equipment**

If breathing apparatus and/or other equipment is used as 'Rescue and emergency response equipment' then the equipment should be suitable for the configuration of the space being surveyed.

**6. Survey at sea or at anchorage**

(1) Survey at sea or at anchorage may be accepted provided the Surveyor is given the necessary assistance from the personnel onboard. Necessary precautions and procedures for carrying out the survey are to be in accordance with **Par 1, Par 2, Par 3** and **Par 4** above.

(2) A communication system is to be arranged between the survey party in the tank or space under examination and the responsible officer on deck. This system is to also include the personnel in charge of ballast pump handling if boats or rafts are used.

(3) Surveys of tanks or applicable holds by means of boats or rafts may only be undertaken with the agreement of the Surveyor, who is to take into account the safety arrangements provided,

including weather forecasting and ship response under foreseeable conditions and provided the expected rise of water within the tank or hold does not exceed 0.25 m.

(4) When rafts or boats are used for Close-up Survey the following conditions are to be observed.

(A) only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, are to be used.

(B) the boat or raft is to be tethered to the access ladder and an additional person is to be stationed down the access ladder with a clear view of the boat or raft.

(C) appropriate lifejackets are to be available for all participants.

(D) the surface of water in the tank or hold is to be calm(under all foreseeable conditions the expected rise of water within the tank or hold is not to exceed 0.25 m) and the water level stationary. On no account is to the level of the water be rising while the boat or raft is in use.

(E) the tank, hold or space must contain clean ballast water only. Even a thin sheen of oil or cargo on the water is not acceptable.

(F) at no time is the water level to 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 is only to 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.

(G) if the tanks(or spaces) are connected by a common venting system, or inert gas system, the tank in which the boat or raft is to be used is to be isolated to prevent a transfer of gas from other tanks(or spaces).

(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.

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

(A) when the coating of the under deck structure is in GOOD condition and there is no evidence of wastage; or

(B) if a permanent means of access is provided in each bay to allow safe entry and exit. This means:

(a) access direct from the deck via a vertical ladder and a small platform fitted approximately 2 m below the deck in each bay; or

(b) access to deck from a longitudinal permanent platform having ladders to deck in each end of the tank. The platform shall, for the full length of the tank, be arranged in level with, or above, the maximum water level needed for rafting of under deck structure. For this purpose, the ullage corresponding to the maximum water level is to be assumed not more than 3 m from the deck plate measured at the midspan of deck transverses and in the middle length of the tank. (For oil tankers, chemical tankers and double hull oil tankers, see **Fig 1.3.1**)

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

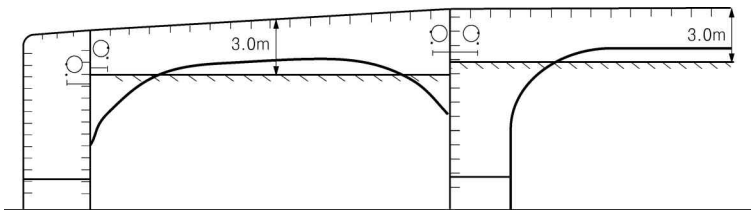



**Fig 1.3.1 Maximum water level in a tank** ***(2024)***

(7) The use of rafts or boats alone in (5) and (6) above does not preclude the use of boats or rafts to move about within a tank during a survey.

**7. Survey planning meeting**

(1) Follow the procedure of Survey planning meeting of **Ch 2, Sec 1. 110.** *(2018)*

## 103. Documentation on board

### 1. General

(1) The Owner is to obtain, supply and maintain on board documentation as specified in **Par 2** and **Par 3** below, which is to be readily available for the Surveyor.

(2) The documentation is to be kept on board for the life time of the ship.

(3) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, the Owner is to arrange the updating of the Ship Construction File(SCF) throughout the ship's life whenever a modification of the documentation included in the SCF has taken place.

Documented procedures for updating the SCF are to be included within the Safety Management System.

### 2. Survey report file

(1) A survey report file is to be a part of the documentation on board consisting of
(A) Reports of structural surveys
(B) Executive hull summary
(C) Thickness measurement reports

(2) The survey report file is to be available also in the Owner's and the Society's management offices.

### 3. Supporting documents

(1) The following additional documentation is to be available onboard.

(A) Main structural plans of cargo holds, cargo tanks and ballast tanks (for vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), these plans are to include for each structural element both the as-built and renewal thickness. Any thickness for voluntary addition is also to be clearly indicated on the plans.

The midship section plan to be supplied on board the ship is to include the minimum allowable hull girder sectional properties for hold/tank transverse section in all cargo holds/tanks)

(B) Previous repair history
(C) Cargo and ballast history
(D) Extent of use of inert gas plant and tank cleaning procedures

(E) The Owners inspection report with reference to (Refer to the **Annex 1-4** of the Guidance) *(2021)*
(a) structural deterioration in general
(b) leakages in bulkheads and piping
(c) condition of corrosion prevention system, if any

(F) Any other information that will help identify critical structural areas and/or suspect areas requiring inspection

(G) Survey programme as required in **102. 1** until such time as the Special Survey or Intermediate Survey, as applicable, has been completed

(2) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, the Ship Construction File(SCF), limited to the items to be retained onboard, is to be available on board.

### 4. Review of documentation on board

(1) Prior to survey, the Surveyor is to examine the completeness of the documentation onboard, and its contents as a basis for the survey.

(2) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, on completion of the survey, the Surveyor is to verify that the update of the Ship Construction File(SCF) has been done whenever a modification of the documentation included in the SCF has taken place.

(A) For the SCF stored on board ship, the surveyor is to examine the information on board ship. In cases where any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structures, the surveyor is to also verify that the updated information is kept on board the ship.

If the updating of the SCF onboard is not completed at the time of survey, the Surveyor records it and requires confirmation at the next periodical survey. *(2018)*

(B) For the SCF stored on shore archive, the surveyor is to examine the list of information included on shore archive. In cases where any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structures, the surveyor is to also verify that the updated information is stored on shore archive by examining the list of information included on shore archive or kept on board the ship.

In addition, the surveyor is to confirm that the service contract with of the Archive Center is valid. If the updating of the SCF Supplement ashore is not completed at the time of survey, the Surveyor records it and requires confirmation at the next periodical survey. *(2018)*

(3) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, on completion of the survey, the Surveyor is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the Ship Construction File list of materials.

## 104. Procedures for thickness measurements *(2021)*

### 1. General *(2018)*

(1) Follow the procedure for thickness measurement of **Ch 2, Sec 1, 111.** *(2018)*

### 2. Locations and number of measurements

(1) For vessels not built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), the requirements for locations and number of thickness measurements are according to **Annex 1-5, Table 3-1** of the Guidance and/or specific requirements, if exist, e.g. IACS UR S31(Renewal Criteria for Side Shell Frames and Brackets in Single Side Skin Bulk Carriers and Single Side Skin OBO Carriers not Built in accordance with UR S12 Rev.1 or subsequent revisions).

(2) For vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), the requirements for locations and number of thickness measurements are according to followings.

(A) Considering the extent of thickness measurements according to the different structural elements of the ship and survey(Special, Intermediate and Annual Survey), the locations of the points to be measured are given for the most important items of the structure.

(B) **Annex 1-5, Table 3-2** of the Guidance provides explanations and/or interpretations for the application of those requirements indicated in the Rules, which refer to both systematic thickness measurements related to the calculation of global hull girder strength and specific measurements connected to Close-up Surveys.

(C) Figures in **Annex 1-5, Table 3-2** of the Guidance are provided to facilitate these explanations and/or interpretations, and to show typical structural arrangements.

### 3. Reporting *(2018)*

(1) Follow the procedure for thickness measurement of **Ch 2, Sec 1, 111.**

## 105. Acceptance criteria for the corrosion

1. For vessels not built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), the acceptance criteria for the corrosion is according to **Annex 1-5, Table 1** of the Guidance and/or specific requirements, if exist, e.g. IACS S18(Evaluation of Scantlings of Corrugated Transverse Watertight Bulkheads in Bulk Carriers Considering Hold Flooding), S19(Evaluation of Scantlings of the Transverse Watertight Corrugated Bulkhead between Cargo Holds Nos. 1 and 2, with Cargo Hold No. 1 Flooded, for Existing Bulk Carriers), S21(Evaluation of Scantlings of Hatch Covers and Hatch Coamings of Cargo Holds of Bulk Carriers, Ore carriers and Combination Carriers), UR S31(Renewal Criteria for Side Shell Frames and Brackets in Single Side Skin Bulk Carriers and Single Side Skin OBO Carriers not Built in accordance with UR S12 Rev.1 or subsequent revisions) as applicable. *(2019)*

2. For vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), the acceptance criteria for the corrosion is according to Ch 13 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**), Sub-part 1, Ch 13 of

IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**) and as specified in the followings.

(1) Acceptance criteria for pitting corrosion

(A) Side structures: for bulk carriers and double skin bulk carriers

If pitting intensity in an area where coating is required, according to Ch 3, Sec 5 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**) or Sub-part 1, Ch 3, Sec 4 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), is higher than 15 % (**Ch 2,** see **Fig 1.2.3**), thickness measurements are to be performed to check the extent of pitting corrosion.

The 15 % is based on pitting or grooving on only one side of a plate.

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

The minimum remaining thickness in pits, grooves or other local areas is to be greater than the following without being greater than the renewal thickness($t_{ren}$):

- 75 % of the as-built thickness, in the frame and end brackets webs and flanges(only for single skin bulk carriers)
- 70 % of the as-built thickness, in the side shell, hopper tank and topside tank plating attached to the each side frame, over a width up to 30 mm from each side of it.

(B) Other structures

For plates with pitting intensity less than 20 % (**Ch 2,** see **Fig 1.2.3**), the measured thickness, $t_m$ of any individual measurement is to meet the lesser of the following criteria:

$$t_m \geq 0.7\left(t_{as-built} - t_{voladd}\right) \quad \text{mm}$$

$$t_m \geq t_{ren} - 1 \quad \text{mm}$$

where,

$t_{as-built}$ as-built thickness of the member, in mm

$t_{voladd}$ voluntary thickness addition; thickness, in mm, voluntarily added as the Owner's extra margin for corrosion wastage in addition to $t_c$

$t_{ren}$ renewal thickness(minimum allowable thickness, in mm, below which renewal of structural members is to be carried out) defined in Ch 13, Sec 2 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Ch 12, Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 13, Sec 2 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable.

$t_c$ total corrosion addition, in mm, defined in Ch 3, Sec 3 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 6 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 3, Sec 3 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable.

$t_m$ measured thickness, in mm, on one items, i.e. average thickness on one item using the various measurements taken on this same item during periodical ship's in service surveys.

The average thickness across any cross section in the plating is not to be less than the renewal criteria for general corrosion given in Ch 13 Sec 2 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Ch 12, Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers (**Pt 12**) or Sub-part 1, Ch 13, Sec 2 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable. *(2019)*

(2) Acceptance criteria for edge corrosion

(A) Provided that the overall corroded height of the edge corrosion of the flange, or web in the case of flat bar stiffeners, is less than 25 % (**Ch 2,** see **Fig 1.2.4**), of the stiffener flange breadth or web height, as applicable, the measured thickness, $t_m$, is to meet the lesser of the following criteria:

$$t_m \geq 0.7\left(t_{as-built} - t_{voladd}\right) \quad \text{mm}$$
$$t_m \geq t_{ren} - 1 \quad \text{mm}$$

where,

For $t_{as-built}$, $t_{voladd}$, $t_{ren}$, $t_c$ and $t_m$, refer to **Ch 3, Sec 1, 105. 2.** (1), (B) *(2019)*

(B) The average measured thickness across the breadth or height of the stiffener is not to be less than the renewal criteria defined in Ch 13 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 13 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable.

(C) Plate edges at openings for manholes, lightening holes, etc. may be below the minimum thickness given in Ch 13 IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 13 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable, provided that:

(a) the maximum extent of the reduced plate thickness, below the minimum given in Ch 13 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 12 of IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 13 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable, from the opening edge is not more than 20 % of the smallest dimension of the opening and does not exceed 100 mm.

(b) rough or uneven edges may be cropped-back provided that the maximum dimension of the opening is not increased by more than 10 % and the remaining thickness of the new edge is not less than $t_{ren} - 1$ mm.

(3) Acceptance criteria for grooving corrosion

(A) Where the groove breadth is a maximum of 15 % of the web height, but not more than 30 mm (**Ch 2,** see **Fig 1.2.5**), the measured thickness, $t_m$, in the grooved area is to meet the lesser of the following criteria:

$$t_m \geq 0.75\left(t_{as-built} - t_{voladd}\right) \quad \text{mm}$$
$$t_m \geq t_{ren} - 0.5 \quad \text{mm}$$

but is not to be less than

$$t_m = 6 \quad \text{mm}$$

where,

For $t_{as-built}$, $t_{voladd}$, $t_{ren}$, $t_c$ and $t_m$, refer to Ch 3, Sec 1, 105. 2. (1), (B) *(2019)*

(B) Structural members with areas of grooving greater than those in (A) above are to be assessed based on the criteria for general corrosion as defined in Ch 13 of IACS Common Structural Rules for Bulk Carriers(**Pt 11**), Sec 12 of IACS Common Structural Rules for

Double Hull Oil Tankers(**Pt 12**) or Sub-part 1, Ch 13 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), as applicable, using the average measured thickness across the plating/stiffener.

## 106. Reporting and evaluation of survey

### 1. Evaluation of survey report

(1) The data and information on the structural condition of the vessel collected during the survey is to be evaluated for acceptability and continued structural integrity of the vessel.

(2) In case of oil tankers(including double hull oil tankers) of 130 m in length and upwards(i.e. length for freeboard($L_f$) as defined in **Pt 3, Ch 1, 103.**), the ship's longitudinal strength is to be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the Special Surveys carried out after the ship reached 10 years of age in accordance with the criteria for longitudinal strength of the ship's hull girder for oil tankers specified in the separate requirements specified by the Society.

However, the only thickness measurement records which have been measured within one(1) year period from the date of the longitudinal strength evaluation shall be considered valid.

(3) For bulk carriers(including double skin bulk carriers) built under IACS Common Structural Rules for Bulk Carriers(**Pt 11**), the ship's longitudinal strength is to be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the Special Surveys carried out after the ship reaches 15 years of age (or during the Special Survey No. 3, if this is carried out before the ship reaches 15 years) in accordance with the criteria for longitudinal strength of the ship's hull girder specified in **Ch 13** of IACS Common Structural Rules for Bulk Carriers(**Pt 11**).

However, the only thickness measurement records which have been measured within one(1) year period from the date of the longitudinal strength evaluation shall be considered valid.

(4) Notwithstanding (2) and (3) above, for ships built under IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), the ship's longitudinal strength is to be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the Special Surveys carried out after the ship reached 10 years of age in accordance with the criteria for longitudinal strength of the ship's hull girder specified in Sub-part 1, Ch 13 of IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**).

However, the only thickness measurement records which have been measured within one(1) year period from the date of the longitudinal strength evaluation shall be considered valid.

(5) The final result of evaluation of the ship's longitudinal strength required (2) to (4) above, after renewal or reinforcement work of structural members, if carried out as a result of initial evaluation, is to be reported as a part of the executive hull summary.

### 2. Reporting

An executive hull summary of the survey and results is to be issued to the Owner and placed on board the vessel for reference at future surveys. The executive hull summary is to be endorsed by the Society.

**3.** When a survey is split between different survey stations, a report is to be made for each portion of the survey. A list of items examined and/or tested(pressure testing, thickness measurements etc.) and an indication of whether the item has been credited, are to be made available to the next attending Surveyor(s), prior to continuing or completing the survey.

# Section 2 Bulk Carriers

## 201. General

### 1. Application

(1) In addition to the requirements specified in **Ch 2**, the requirements apply to surveys of hull structure and piping systems in way of the following spaces for all bulk carriers with ESP notation other than double skin bulk carriers as defined in **601. 2** (1).

(a) cargo holds, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo length area
(b) all ballast tanks

(2) The requirements contain the minimum extent of examination, thickness measurement and tank testing. The survey is to be extended when Substantial Corrosion and/or structural defects are found and include additional Close-Up Survey "when necessary". *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

(3) Ships, specified in **Pt 7, Annex 7-5, 1** of the Guidance, which are required to comply with IACS UR S19(Evaluation of Scantlings of the Transverse Watertight Corrugated Bulkhead between Cargo Holds Nos. 1 and 2, with Cargo Hold No.1 Flooded, for Existing Bulk Carriers) are subject to the additional thickness measurement guidance contained in **Annex 1-5, Table 9** of the Guidance with respect to the vertically corrugated transverse watertight bulkhead between cargo hold Nos.1 and 2 for purpose of determining compliance with UR S19 prior to the relevant compliance deadline stipulated in UR S23(Implementation of IACS UR S19 and S22 for Existing Single Side Skin Bulk Carriers) as following and at subsequent Intermediate Surveys(for ships over 10 years of age) and Special Surveys for purpose of verifying continuing compliance with UR S19.

(A) For ships which were 20 years of age or more on 1 July 1998, by the due date of the first Intermediate or the due date of the first Special Survey to be held after 1 July 1998, whichever comes first, the compliance with the requirements specified in **Pt 7, Annex 7-5** of the Guidance is to be confirmed.

(B) For ships which were 15 years of age or more but less than 20 years of age on 1 July 1998, by the due date of the first Special Survey to be held after 1 July 1998, but not later than 1 July 2002, the compliance with the requirements specified in **Pt 7, Annex 7-5** of the Guidance is to be confirmed.

(C) For ships which were 10 years of age or more but less than 15 years of age on 1 July 1998, by the due date of the first Intermediate, or the due date of the first Special Survey to be held after the date on which the ship reaches 15 years of age but not later than the date on which the ship reaches 17 years of age, the compliance with the requirements specified in **Pt 7, Annex 7-5** of the Guidance is to be confirmed.

(D) For ships which were 5 years of age or more but less than 10 years of age on 1 July 1998, by the due date, after 1 July 2003, of the first Intermediate or the first Special Survey after the date on which the ship reaches 10 years of age, whichever occurs first, the compliance with the requirements specified in **Pt 7, Annex 7-5** of the Guidance is to be confirmed.

(E) For ship which were less than 5 years of age on 1 July 1998, by the date on which the ship reaches 10 years of age, the compliance with the requirements specified in **Pt 7, Annex 7-5** of the Guidance is to be confirmed.

(F) Completion prior to 1 July 2003 of an Intermediate or Special Survey with a due date after 1 July 2003 cannot be used to postpone compliance. However, completion prior to 1 July 2003 of an Intermediate Survey the window for which straddles 1 July 2003 can be accepted.

(4) Ships, specified in **Pt 7, Ch 3, Sec 17** which required to comply with IACS UR S31(Renewal Criteria for Side Shell Frames and Brackets in Single Side Skin Bulk Carriers and Single Side Skin OBO Carriers not Built in accordance with UR S12 Rev.1 or subsequent revisions) are subject to the additional thickness measurement guidance contained in **Pt 7, Ch 3, Sec 17** and the separate requirements specified by the Society with respect to the side shell frames and brackets for the purpose of determining compliance with UR S31 prior to the relevant compliance

deadline stipulated in UR S31 as following and at subsequent Intermediate and Special Surveys for purpose of verifying continuing compliance with UR S31.

(A) Bulk Carriers subject to the requirements specified in **Pt 7, Ch 3, Sec 17** are to be assessed for compliance with the requirements of this rules and steel renewal, reinforcement or coating, where required in accordance with this rules, is to be carried out in accordance with the following schedule and at subsequent Intermediate and Special Surveys.

(a) For bulk carriers which will be 15 years of age or more on 1 January 2004 by the due date of the first Intermediate or Special Survey after that date;

(b) For bulk carriers which will be 10 years of age or more on 1 January 2004 by the due date of the first Special Survey after that date;

(c) For bulk carriers which will be less than 10 years of age on 1 January 2004 by the date on which the ship reaches 10 years of age.

(d) Completion prior to 1 January 2004 of an Intermediate or Special Survey with a due date after 1 January 2004 cannot be used to postpone compliance. However, completion prior to 1 January 2004 of an Intermediate Survey the window for which straddles 1 January 2004 can be accepted.

(B) OBO carriers subject to the requirements specified in **Pt 7, Ch 3, Sec 17** are to be assessed for compliance with the requirements of this rules and steel renewal, reinforcement or coating, where required in accordance with this rules, is to be carried out in accordance with the following schedule and at subsequent Intermediate and Special Surveys.

(a) For OBO carriers which will be 15 years of age or more on 1 July 2005 by the due date of the first Intermediate or Special Survey after that date;

(b) For OBO carriers which will be 10 years of age or more on 1 July 2005 by the due date of the first Special Survey after that date;

(c) For OBO carriers which will be less than 10 years of age on 1 July 2005 by the date on which the ship reaches 10 years of age.

(d) Completion prior to 1 July 2005 of an Intermediate or Special Survey with a due date after 1 July 2005 cannot be used to postpone compliance. However, completion prior to 1 July 2005 of an Intermediate Survey the window for which straddles 1 July 2005 can be accepted.

(5) For bulk carriers with hybrid cargo hold arrangements, e.g. with some cargo holds of single side skin and others of double side skin, the requirements of **Sec 6** are to apply to cargo hold of double side skin and associated wing spaces.

(6) All bulk carriers, which required to comply with IACS UR S30(Cargo Hatch Cover Securing Arrangements for Bulk Carriers not Built in accordance with UR S21(Rev.3)), not built in accordance with **Pt 7, Ch 3, Sec 9** are to comply with the requirements specified in **Pt 7, Ch 3, Sec 18** in accordance with the following schedule:

(A) For ships which will be 15 years of age or more on 1 January 2004 by the due date of the first Intermediate or Special Survey after that date;

(B) For ships which will be 10 years of age or more on 1 January 2004 by the due date of the first Special Survey after that date;

(C) For ships which will be less than 10 years of age on 1 January 2004 by the date on which the ship reaches 10 years of age.

(D) Completion prior to 1 January 2004 of an Intermediate or Special Survey with a due date after 1 January 2004 cannot be used to postpone compliance. However, completion prior to 1 January 2004 of an Intermediate Survey the window for which straddles 1 January 2004 can be accepted.

## 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

## 202. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **Ch 2, 201.**

(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, weather decks, hatch covers, coamings and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. *(2019)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.

(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather decks, hatch covers and coamings

(1) Confirmation is to be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

(2) A thorough survey of cargo hatch covers and coamings is only possible by examination in the open as well as closed positions and is to include verification of proper opening and closing operation. As a result, the hatch cover sets within the forward 25 % of the ship's length and at least one additional set, such that all sets on the ship are assessed at least once in every 5-year period, are to be surveyed open, closed and in operation to the full extent on each direction at each Annual Survey, including:

(A) stowage and securing in open condition
(B) proper fit and efficiency of sealing in closed condition
(C) operational testing of hydraulic and power components, wires, chains, and link drives

The closing of the covers is to include the fastening of all peripheral and cross joint cleats or other securing devices. Particular attention is to be paid to the condition of the hatch covers in the forward 25 % of the ship's length, where sea loads are normally greatest.

(3) If there are indications of difficulty in operating and securing hatch covers, additional sets above those required by (2), at the discretion of the Surveyor, are to be tested in operation.

(4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 4, Ch 2, Sec 5**. *(2019)*

(5) For each cargo hatch cover set, at each Annual Survey, the following items are to be surveyed:

(A) cover panels, including side plates, and stiffener attachments that may be accessible in the open position by Close-up Survey(for corrosion, cracks, deformation)

(B) sealing arrangements of perimeter and cross joints(gaskets for condition and permanent deformation, flexible seals on combination carriers, gasket lips, compression bars, drainage channels and non return valves)

(C) clamping devices, retaining bars, cleating(for wastage, adjustment, and condition of rubber components)

(D) closed cover locating devices(for distortion and attachment)
(E) chain or rope pulleys
(F) guides
(G) guide rails and track wheels
(H) stoppers
(I) wires, chains, tensioners, and gypsies
(J) hydraulic system, electrical safety devices and interlocks
(K) end and interpanel hinges, pins and stools where fitted

(6) At each hatchway, at each Annual Survey, the coamings, with plating, stiffeners and brackets are to be checked for corrosion, cracks and deformation, especially of the coaming tops, including Close-up Survey. *(2019)*

(7) Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 1** of the Guidance when requiring the tightness test.

(8) Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition, where applicable, of:

(A) wooden covers and portable beams, carriers or sockets for the portable beam, and their securing devices
(B) steel pontoons, including Close-up Survey of hatch cover plating
(C) tarpaulins
(D) cleats, battens and wedges
(E) hatch securing bars and their securing devices
(F) loading pads/bars and the side plate edge
(G) guide plates and chocks
(H) compression bars, drainage channels and drain pipes(if any)

(9) Examination of flame screens on the open ends of air pipes to all bunker tanks.
(10) Examination of bunker and vent piping systems, including ventilators.

### 4. Examination of cargo holds *(2021)*

The examination of cargo holds in Annual Survey is to be in accordance with the follows.

| | 10 years< age ≤ 15 years[2), 3)] | 15 years< age[2), 3)] |
|---|---|---|
| Overall Survey | All cargo holds | All cargo holds |
| Close-up Survey | 1. Cargo Holds:<br>- forward cargo hold<br>2. Extent:<br>Close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating[1)] | 1. Cargo Holds:<br>- forward cargo hold<br>- one other selected cargo hold<br>2. Extent:<br>Close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating[1)] |
| Others | All piping and penetrations in cargo holds, including overboard piping, are to be examined. | All piping and penetrations in cargo holds, including overboard piping, are to be examined. |

(NOTES)

1) Where this level of survey reveals the need for remedial measures, the survey is to be extended to include a Close-up Survey of all of the shell frames and adjacent shell plating of that cargo hold as well as a Close-up Survey of sufficient extent of all remaining cargo holds.

2) When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 14** of the Guidance. These increased thickness measurements are to be carried out before the Annual Survey is credited as completed.

   Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurement taken.

   For vessels built under the IACS Common Structural Rules(**Pt 11** or **Pt 13**), the annual thickness gauging may be omitted where a hard protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in GOOD condition.

   Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

3) Where a hard protective coating in cargo holds is found to be in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

### 5. Examination of ballast tanks *(2023)*

Examination of "ballast tanks when required" as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out.

If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 14** of the Guidance.

These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined.

Areas of substantial corrosion identified at previous survey are to have thickness measurements taken. For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the annual thickness gauging may be omitted where a hard protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in GOOD condition.

Note :

1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

**6. Additional Annual Survey requirements for the foremost cargo hold of ships subject to SOLAS XII/9.1**

(1) Ships subject to SOLAS XII/9.1 are those meeting all the following conditions;

- Bulk Carriers of 150 $\mathrm{m}$ in length and upwards of single side skin construction,
- carrying solid bulk cargoes having a density of 1780 $\mathrm{kg/m^3}$ and above,
- contracted for construction before 1 July 1999, and
- constructed with an insufficient number of transverse watertight bulkheads to enable them to withstand flooding of the foremost cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium as specified in SOLAS XII/4.3.

(2) In accordance with SOLAS XII/9.1, for the foremost cargo hold of such ships, the additional survey requirements listed in the Guidance relating to the Rules shall apply. **【See Guidance】**

**7. Additional Annual Survey requirements after determining compliance with SOLAS XII/12 and XII/13**

(1) For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the Annual Survey is to include an examination and a test, at random, of the water ingress detection systems and of their alarms.

(2) For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the Annual Survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

## 203. Intermediate Survey

**1. General**

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **Ch 2, 301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) Bulk carriers exceeding 10 years of age up to 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent to the previous Special Survey as required in **204.** and **102. 1.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, internal examination of fuel tanks and pressure testing of all tanks are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 6** or **4** of the Guidance when requiring the internal examination or the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, an under water survey may be considered in lieu of the requirements of **204. 1** (6).

(4) Bulk carriers over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent to the previous Special Survey as required in **204.** and **102. 1.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, internal examination of fuel tanks and pressure testing of all tanks are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 6** or **4** of the Guidance when requiring the internal examination or the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, a survey in dry dock is to be part of the Intermediate Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

### 2. Examination of ballast tanks

The examination of ballast tanks in Intermediate Survey is to be in accordance with the follows.

| 5 years< age ≤ 10 years[1), 2), 3)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|
| 1. Overall Survey of representative ballast tanks<br>2. Overall Survey and Close-up Survey of suspect areas identified at previous surveys | **203. 1** (3) to be applied. | **203. 1** (4) to be applied. |

(NOTES)

1) The selection is to include fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks. If such Overall Survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

2) Where a hard coating is found to be in less than GOOD condition, corrosion or other defects are found in ballast tanks or where a hard protective coating was not applied from the time of construction, the examination is to be extended to "other ballast tanks of the same type"*****. *(2024)*

***** "Other ballast tanks of same type" is to be applied as followings;
a) aft peak & fore peak shall be considered as same type.
b) In case other ballast tanks are not of identical construction, the additional tank(s) is(are) to be examined because the progression of corrosion is not only related to the construction type, and the corrosion prevention system and the history of usage of the tanks are to be considered.
c) In case of water ballast hold, all water ballast holds are surveyed.

3) In ballast tanks other than double bottom ballast tanks, where a hard protective coating is found to be in less than GOOD condition, and it is not renewed, or where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined and thickness measurements carried out as considered necessary at annual intervals. *(2024)*

When such breakdown of hard protective coating is found in double bottom ballast tanks, of where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied, the tanks in question may be examined at annual intervals. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 3. Examination of cargo holds

The examination of cargo holds in Intermediate Survey is to be in accordance with the follows.

| | 5 years< age ≤ 10 years[1)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|---|
| Overall Survey | All cargo holds | **203. 1** (3) to be applied. | **203. 1** (4) to be applied. |
| Close-up Survey *(2019)* | 1. Cargo holds:<br>-forward cargo hold<br>-one other selected cargo hold.<br>2. Extent :<br>Survey of sufficient extent, minimum 25% of frames, is to be carried out to establish the condition of:<br>shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads<br>3. Suspect areas found at previous surveys | **203. 1** (3) to be applied. | **203. 1** (4) to be applied. |

(NOTES)

1) Where "considered necessary by the Surveyor" as a result of the Overall and Close-up Survey, the survey is to be extended to include a Close-up Survey of all of the shell frames and adjacent shell plating of that cargo hold as well as a Close-up Survey of sufficient extent of all remaining cargo holds.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

### 4. Extent of thickness measurement *(2022)*

(1) Bulk carriers exceeding 5 years of age up to 10 years of age, the following is to apply:

(a) Thickness measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to Close-up Survey, as described in Par 3. and in case of areas found to be suspect areas at previous surveys, thickness measurements for suspect areas are to be carried out additionally. *(2017)*

(b) The thickness measurement may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating provided the Surveyor is satisfied by the Close-up Survey, that there is no structural diminution and the hard protective coatings are found to be in a GOOD condition. *(2019)*

(c) Where substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 14** of the Guidance. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the identified substantial corrosion areas may be: *(2021)*

(i) protected by a hard protective coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in GOOD condition, or alternatively

(ii) required to be measured at annual intervals.

(d) Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

Note : For existing bulk carriers, where Owners may elect to coat or recoat cargo holds as noted above, consideration may be given to the extent of the Close-up Surveys and thickness measurement. Prior to the coating of cargo holds of existing ships, scantlings should be ascertained in the presence of a Surveyor.

(2) Bulk carriers exceeding 10 years of age up to 15 years of age, **Par 1** (3) above is to apply.

(3) Bulk carriers exceeding 15 years of age, **Par 1** (4) above is to apply.

## 204. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **Ch 2, 401.**

(2) The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests, and checks of sufficient extent to ensure that the hull and related piping, as required in (4), is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(3) All cargo holds, ballast tanks, including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in **Par 5** and **Par 6**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(4) All piping systems within the spaces specified in (3) above are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remains satisfactory.

(5) The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks. Where the hard protective coating in void space is found to be in a GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2022)*

Note : For survey of automatic air pipe heads refer to **403. 1** (17).

(6) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

### 2. Space protection *(2024)*

(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found to be in less than Good condition and it is not renewed, or where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as “deemed necessary by the Surveyor”. *(2024)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(2) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied from the time of construction, the tanks in question may be examined at annual intervals. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) Where a hard protective coating is provided in cargo holds and is found in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

### 3. Hatch covers and coamings

In addition to the requirements in **202. 3** of the Annual Survey, the following items are to be surveyed.

(1) Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:

(a) stowage and securing in open condition
(b) proper fit and efficiency of sealing in closed condition
(c) operational testing of hydraulic and power components, wires, chains, and link drives.

(2) Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent.

(3) Close-up Survey and thickness measurement* of the hatch cover and coaming plating and stiffeners are to be carried out as given in **Table 1.3.1** and **Table 1.3.2.**

* Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.

### 4. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces specified in **201. 1** (1) (a) and (b) is to be carried out at each Special Survey. Fuel oil tanks in cargo length area are to be surveyed as follows: *(2020)*

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| - | One | Two | Half, minimum two |

(NOTES)

1. These requirements apply to tanks of integral (structural) type.
2. If a selection of tanks is accepted to be examined, then different tanks are to be examined at each Special Survey, on a rotational basis.
3. Peak tanks (all uses) are subject to internal examination at each Special Survey.
4. At Special Survey No. 3 and subsequent Special Surveys, one deep tank for fuel oil in the cargo area is to be included, if fitted.

(2) The minimum requirements for Close-up Survey at Special Survey are given in **Table 1.3.1.**

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or details which have suffered defects in similar spaces or on similar ships according to available information.

(4) For areas in spaces where hard protective coatings are found to be in a GOOD condition, the extent of Close-up Surveys according to **Table 1.3.1** may be reduced by sufficiently confirming

the actual average condition of the structure under the coating. (Refer also to **204. 2** (3)) *(2019)*

### 5. Extent of thickness measurement

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.3.2.** For additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with IACS URs S19 and S23, reference is to be made to **201. 1** (3) and **Annex 1-5**, **Table 9** of the Guidance.

For additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31, reference is to be made to **201. 1** (4) and **Pt 7, Ch 3, Sec 17** of the Rules and the separate requirements specified by the Society.

(2) Provisions for extended measurements for areas with substantial corrosion are given in **Annex 1-5, Table 14** of the Guidance and as may be additionally specified in the survey programme as required in **102. 1.** These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the identified substantial corrosion areas may be: *(2021)*

(A) protected by a hard protective coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in GOOD condition, or alternatively

(B) required to be measured at annual intervals.

(3) The Surveyor may further extend the thickness measurements as “deemed necessary”. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(4) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurement according to **Table 1.3.2** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. (Refer also to **204. 2** (3)) *(2019)*

(5) Transverse sections are to be chosen where largest reductions are suspected to occur or are revealed from deck plating measurements, one of which is to be in the amidships area.

(6) Representative thickness measurement to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds and ballast tanks is to be carried out.

Thickness measurement is also to be carried out to determine the corrosion levels on the transverse bulkhead plating. The extent of thickness measurements may be reduced by confirming the actual average condition of the structure under the coating provided the Surveyor is satisfied by the Close-up Survey, that there is no structural diminution, and the hard protective “coating where applied remains efficient”. *(2021)*

Note : "coating where applied remains efficient" means the cases where the coatings are found in a GOOD condition.

### 6. Extent of tank testing

The minimum requirements for tank testing at Special Survey are given in **Table 1.3.3.**

### 7. Additional Special Survey requirements after determining compliance with SOLAS XII/12 and XII/13

(1) For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the Special Survey is to include an examination and a test of the all water ingress detection systems and of their alarms.

(2) For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the Special Survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

**Table 1.3.1 Minimum requirements for Close-up Survey at Special Survey of Bulk Carriers**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. 25% of shell frames in the forward cargo hold at representative positions, and selected frames in remaining cargo holds (*1) | 1. All shell frames in the forward cargo hold and 25% of shell frames in each of the remaining cargo holds including upper and lower end attachments and adjacent shell plating. For bulk carriers 100,000 DWT and above, all shell frames in the forward cargo hold and 50% of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. (*1) | 1. All shell frames in the forward and one other selected cargo hold and 50% of frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating (*1) | 1. All shell frames in all cargo holds, including upper and lower end attachments and adjacent shell plating (*1) |
| 2. One transverse web with associated plating and longitudinals in two representative ballast tanks of each type (i.e. topside, or hopper side tank) (*2) | 2. One transverse web with associated plating and longitudinals in each ballast tank (*2) | 2. All transverse webs with associated plating and longitudinals in each ballast tank (*2) | 2. All transverse webs with associated plating and longitudinals in each ballast tank (*2) |
| 3. Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 3. Forward and aft transverse bulkhead in one ballast tank, including stiffening system (*2) | 3. All transverse bulkheads in ballast tanks, including stiffening system (*2) | 3. All transverse bulkheads in ballast tanks, including stiffening system (*2) |
| 4. All cargo hold hatch covers and coamings (plating and stiffeners) (*4) | 4. All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 4. All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 4. All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) |
| | 5. All cargo hold hatch covers and coamings (plating and stiffeners) (*4) | 5. All cargo hold hatch covers and coamings (plating and stiffeners) (*4) | 5. All cargo hold hatch covers and coamings (plating and stiffeners) (*4) |
| | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. (*5) | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. (*5) | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. (*5) |

(NOTES)

1. (*1) to (*5) means as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6, 1** (2) of the Guidance: *(2021)*
   (*1) : Cargo hold transverse frames
   (*2) : Transverse web frame or watertight transverse bulkhead in ballast tanks
   (*3) : Cargo hold transverse bulkheads stiffeners and girders
   (*4) : Cargo hold hatch covers and coamings. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.
   (*5) : Deck plating and under deck structure inside line of hatch openings between cargo hold hatches
2. Close-up Survey of transverse bulkheads to be carried out at four levels:
   Level(a) : Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
   Level(b) : 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.
   Level(c) : About mid-height of the bulkhead.
   Level(d) : 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.

**Table 1.3.2 Minimum requirements for thickness measurements at Special Survey of Bulk Carriers**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas | 1. Suspect areas | 1. Suspect areas | 1. Suspect areas |
| | 2. Within the cargo length:<br>1) Two transverse sections of deck plating outside line of cargo hatch openings | 2. Within the cargo length:<br>1) Each deck plate outside line of cargo hatch openings<br>2) Two Transverse Sections, one in the amidship area, outside line of cargo hatch openings<br>3) All wind and water strakes | 2. Within the cargo length:<br>1) Each deck plate outside line of cargo hatch openings<br>2) Three Transverse Sections, one in the amidship area, outside line of cargo hatch openings<br>3) Each bottom plate |
| | 3.<br>1) Wind and water strakes in way of the transverse sections considered under **2** above<br>2) Selected wind and water strakes outside the cargo length area | 3. Selected wind and water strakes outside the cargo length area | 3. All wind and water strakes, full length |
| | 4. Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.1** | 4. Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.1** | 4. Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.1** |
| | 5. See **201. 1** (4), **Pt 7, Ch 3, Sec 17** and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 | 5. See **201. 1** (3) and **Annex 1-5, Table 9** of the Guidance for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with IACS URs S19 and S23<br>6. See **201. 1** (4), **Pt 7, Ch 3, Sec 17** and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 | 5. See **201. 1** (3) and **Annex 1-5, Table 9** of the Guidance for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with IACS URs S19 and S23<br>6. See **201. 1** (4), **Pt 7, Ch 3, Sec 17** and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 |

**Table 1.3.3 Minimum requirements for tank testing at Special Survey of Bulk Carriers**

| No. of Special Survey / Tanks or spaces | Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|---|
| All boundaries of ballast tanks, deep tanks and cargo holds used for water ballast within the cargo length area | ○ | ○ | ○ | ○ |

(NOTES)

1. For fuel oil tanks within the cargo length area, only representative tanks are to be pressure tested.
2. The Surveyor may extend the tank testing as "deemed necessary".

   Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*
3. Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.
4. Boundaries of ballast holds are to be tested with a head of liquid to near to the top of hatches.
5. Boundaries of fuel oil tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.
6. The testing of double bottom and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tanktop is carried out.

# Section 3 Oil Tankers

## 301. General

### 1. Application

(1) In addition to the requirements specified in **Ch 2**, the requirements apply to surveys of hull structure and piping systems in way of the following spaces for all oil tankers with ESP notation other than Double Hull Oil Tankers as defined in **501. 2** (1).

(a) cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area
(b) all ballast tanks

(2) The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when substantial corrosion and/or structural defects are found and include additional Close-up Survey "when necessary". *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102**. *(2020)*

## 302. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **Ch 2, 201.**
(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. *(2019)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.
(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather decks

(1) Examination of cargo tank openings including gaskets, covers, coamings and flame screens.
(2) Examination of cargo tanks pressure/vacuum valves and flame screens.
(3) Examination of flame screens on the open ends of air pipes to all bunker tanks.
(4) Examination of cargo, crude oil washing, bunker and vent piping systems, including vent masts and headers.

### 4. Examination of cargo pump rooms and pipe tunnels(if fitted)

(1) Examination of all pump room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room bulkheads.

(2) Examination of the condition of all piping systems.

### 5. Examination of ballast tanks *(2023)*

Examination of "ballast tanks where required" as a consequence of the results of the Special Survey(See **304. 2**) and Intermediate Survey(See **303. 3**) is to be carried out. When "considered necessary by the Surveyor", or when extensive corrosion exists, thickness measurements are to be carried out and

if the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 15** of the Guidance. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

Note :

1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

## 303. Intermediate Survey

### 1. General

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **Ch 2, 301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) Oil tankers exceeding 10 years of age up to 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **304.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder as required in **106. 1** (2) are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** or **1** of the Guidance when requiring the pressure test or the longitudinal strength evaluation of hull girder.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, an under water survey may be considered in lieu of the requirements of **304. 1** (5).

(4) Oil tankers over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **304.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder as required in **106. 1** (2) are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** or **1** of the Guidance when requiring the pressure test or the longitudinal strength evaluation of hull girder.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, a survey in dry dock is to be a part of the Intermediate Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

### 2. For weather decks, an examination as far as applicable of:

(1) Cargo, crude oil washing, bunker, ballast, steam and vent piping systems as well as vent masts and headers is to be carried out.

(2) If upon examination there is any doubt as to the condition of the piping, the piping may be required to be pressure tested, thickness measured or both.

### 3. Extent of examination

The examination in Intermediate Survey is to be in accordance with the follows.

| 5 years< age ≤ 10 years[1), 2)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|
| 1. All ballast tanks<br>2. Suspect areas identified at previous surveys | **303. 1** (3) to be applied. | **303. 1** (4) to be applied. |

(NOTES)

1) When "considered necessary by the Surveyor", thickness measurement and testing are to be carried out to ensure that the structural integrity remains effective.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

2) A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion is found within the tank, or
- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

## 304. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **Ch 2, 401.**

(2) The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in (4), is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(3) All cargo tanks, ballast tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, this examination is to be supplemented by thickness measurement and testing as required in **Par 4** and **Par 5**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(4) Cargo piping on deck, including crude oil washing(COW) piping, cargo and ballast piping within the spaces specified in (3) above are to be examined and "operationally tested to working pressure" to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

Special attention is to be given to any ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces, and Surveyors are to be advised on all occasions when this piping, including valves and fittings are opened during repair periods and can be examined internally. *(2021)*

Note : The term "operationally tested to working pressure" means the confirmation of the leakage or excessive vibration, etc.

(5) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

### 2. Tank protection *(2023)*

Where provided, the condition of the corrosion prevention system of cargo tanks is to be examined. A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion is found within the tank, or
- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

Thickness measurements are to be carried out as “deemed necessary by the Surveyor”.

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 3. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces specified in **301. 1** (1) (a) and (b) is to be carried out at each Special Survey. *(2020)*

(2) The minimum requirements for Close-up Survey at Special Survey are given in **Table 1.3.4.**

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

(a) In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.

(b) In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

(4) For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of Close-up Surveys according to **Table 1.3.4** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

### 4. Extent of thickness measurement

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.3.5.**

(2) Provisions for extended measurements for areas with substantial corrosion are given in **Annex 1-5, Table 15** of the Guidance, and as may be additionally specified in the survey programme as required in **102. 1.** These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken. *(2021)*

(3) The Surveyor may further extend the thickness measurements as “deemed necessary”. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(4) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurements according to **Table 1.3.5** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

(5) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

(6) In case where two or three sections are to be measured, at least one is to include a ballast tank within 0.5 $L$ amidships. In case of oil tankers of 130 m in length and upwards(i.e. length for freeboard($L_f$) as defined in **Pt 3, Ch 1, 103.**) and more than 10 years of age, for the evaluation of the ship's longitudinal strength as required in **106. 1** (2), the sampling method of thickness measurements is given in **Annex 1-5, Par 6** of the Guidance. *(2021)*

**5. Extent of tank testing 【See Guidance】**

(1) The minimum requirements for tank testing at Special Survey are given in **Table 1.3.6.**

(2) Cargo tank testing carried out by the ship's crew under the direction of the Master may be accepted by the Surveyor provided the following conditions are complied with: *(2024)*

(A) a tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, etc. has been submitted by the Owner and reviewed by the Society prior to the testing being carried out.

(B) the tank testing is carried out prior to overall survey or close-up survey. *(2024)*

(C) the tank testing is carried out within the Special Survey window and not more than 3 months prior to the date on which the overall or close-up survey is completed. *(2024)*

(D) the tank testing has been satisfactorily carried out and there is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank.

(E) the satisfactory results of the testing is recorded in the ship's logbook. and *(2024)*

(F) the internal and external condition of the tanks and associated structure are found satisfactory by the Surveyor at the time of the Overall and Close-up Survey.

**Table 1.3.4 Minimum requirements for Close-up Survey at Special Survey of Oil Tankers, Ore/Oil Ships and etc.[1] *(2023)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. One web frame ring in a ballast wing tank, if any, or a cargo wing tank, used primarily for water ballast (*1) | 1. All web frame rings in a ballast wing tank, if any, or a cargo wing tank, used primarily for water ballast (*1) | 1. All web frame rings in all ballast tanks (*1)<br>2. All web frame rings in a cargo wing tank (*1) | 1. All web frames rings in all ballast tanks (*1)<br>2. All web frame rings in a cargo wing tank (*1) |
| 2. One deck transverse in a cargo oil tank (*2) | 2. One deck transverse in each of the remaining ballast tanks, if any (*2)<br>3. One deck transverse in a cargo wing tank (*2)<br>4. One deck transverse in two cargo centre tanks (*2) | 3. A minimum of 30% of all web frame ring in each remaining cargo wing tank (*1)[2] | 3. A minimum of 30% of all web frame ring in each remaining cargo wing tank (*1)[2] |
| | 5. Both transverse bulkheads in a wing ballast tank, if any, or a cargo wing tank used primarily for water ballast (*3) | 4. All transverse bulkheads in all cargo and ballast tanks (*3) | 4. All transverse bulkheads in all cargo and ballast tanks (*3) |
| 3. One transverse bulkhead in a ballast tank (*4) | 6. One transverse bulkhead in each remaining ballast tank (*4) | 5. A minimum of 30% of deck and bottom transverse including adjacent structural members in each cargo centre tank (*5) | 5. A minimum of 30% of deck and bottom transverse including adjacent structural members in each cargo centre tank (*5) |
| 4. One transverse bulkhead in a cargo oil wing tank (*4) | 7. One transverse bulkhead in a cargo oil wing tank (*4) | 6. As "considered necessary by the Surveyor" (*6) | 6. As "considered necessary by the Surveyor" (*6) |
| 5. One transverse bulkhead in a cargo oil centre tank (*4) | 8. One transverse bulkhead in two cargo centre tanks (*4) | | 7. Additional transverses included as "deemed necessary by the Society" |

(NOTES)

1) (*1) to (*6) mean as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6, 1**, (3) of the Guidance: *(2021)*
   (*1) : Complete transverse web frame ring including adjacent structural members
   (*2) : Deck transverse including adjacent deck structural members
   (*3) : Transverse bulkhead complete including girder system and adjacent structural members
   (*4) : Transverse bulkhead lower part including girder system and adjacent structural members
   (*5) : Deck and bottom transverse including adjacent structural members
   (*6) : Additional complete transverse web frame ring

2) The 30 % is to be rounded up to the next whole integer.

3) The term "considered necessary by the Surveyor" and "deemed necessary by the Society" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

**Table 1.3.5 Minimum requirements for thickness measurements at Special Survey of Oil Tankers, Ore/Oil Ships and etc.**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas<br>2. One transverse section of deck plating for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast)<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.4** | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2) One transverse section<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.4**<br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2) Two transverse sections[1]<br>3) All wind and water strakes<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.4**<br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2) Three transverse sections[1]<br>3) Each bottom plate<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.4**<br>4. All wind and water strakes, full length |

(NOTES)

1) At least one section is to include a ballast tank within 0.5 $L$ amidships.

**Table 1.3.6 Minimum requirements for tank testing at Special Survey of Oil Tankers, Ore/Oil Ships and etc.**

| Special Survey No. 1 | Special Survey No. 2 and Subsequent |
|---|---|
| 1. All ballast tank boundaries<br>2. Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, pump-rooms or cofferdams | 1. All ballast tank boundaries<br>2. All cargo tank bulkheads |

(NOTES)

1. The Surveyor may extend the tank testing as "deemed necessary".

   Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*

2. Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.
3. Boundaries of cargo tanks are to be tested to the highest point that liquid will rise under service conditions.

# Section 4 Chemical Tankers

## 401. General

### 1. Application

(1) In addition to the requirements specified in **Ch 2**, the requirements apply to all Chemical Tankers, with ESP notation, with integral tanks.

If a chemical tanker is constructed with both integral and independent tanks, these requirements are applicable only to that portion of the cargo length containing integral tanks.

Combined gas carriers/chemical tankers with independent tanks within the hull, are to be surveyed as gas carriers.

(2) The requirements apply to surveys of hull structure and piping systems in way of following spaces. The requirements are not applicable for independent tanks on deck:

(a) cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area
(b) all ballast tanks

(3) These requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when substantial corrosion and/or structural defects are found and include additional Close-up Survey when necessary. *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

## 402. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **Ch 2, 201.**
(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. *(2019)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.
(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather decks

(1) Examination of cargo tank openings including gaskets, covers, coamings and flame screens.
(2) Examination of cargo tanks pressure/vacuum valves and flame screens.
(3) Examination of flame screens on the open ends of air pipes to all bunker tanks.
(4) Examination of cargo, bunker and vent piping systems, including vent masts and headers.

### 4. Examination of cargo pump rooms and pipe tunnels(if fitted)

(1) Examination of all pump room bulkheads for signs of chemical leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room bulkheads.

(2) Examination of the condition of all piping systems.

### 5. Examination of ballast tanks *(2023)*

Examination of “ballast tanks where required” as a consequence of the results of the Special Survey(See **404. 2**) and Intermediate Survey (See **403. 3**) is to carried out. When “considered necessary by the Surveyor”, or when extensive corrosion exists, thickness measurements are to be carried out and if the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 16** of the Guidance. These

extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

Note :

1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

## 403. Intermediate Survey

### 1. General

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **Ch 2, 301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) Chemical tankers exceeding 10 years of age up to 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **404.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, pressure testing of cargo and ballast tanks is not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** of the Guidance when requiring the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, an under water survey may be considered in lieu of the requirements of **404. 1** (5).

(4) Chemical tankers over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **404.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied) However, pressure testing of cargo and ballast tanks is not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** of the Guidance when requiring the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, a survey in dry dock is to be a part of the Intermediate Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

### 2. For weather decks, an examination as far as applicable of:

(1) Cargo, bunker, ballast, steam and vent piping systems as well as vent masts and headers is to be carried out.

(2) If upon examination there is any doubt as to the condition of the piping, the piping may be required to be pressure tested, thickness measured or both.

### 3. Extent of examination

The examination in Intermediate Survey is to be in accordance with the follows.

| 5 years< age ≤ 10 years[1), 2)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|
| 1. Overall Survey of representative ballast tanks<br>2. Examination of suspect areas identified at previous surveys | **403. 1** (3) to be applied. | **403. 1** (4) to be applied. |
| (NOTES)<br>1) If such inspections reveal no visible structural defects, the examination may be limited to a verification that the hard protective coating remains in GOOD condition.<br>2) A ballast tank is to be examined at subsequent annual intervals where:<br>- a hard protective coating has not been applied from the time of construction, or<br>- a soft or semi-hard coating has been applied, or<br>- substantial corrosion is found within the tank, or<br>- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor. | | |

## 404. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **Ch 2, 401.**

(2) The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in (4), is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(3) All cargo tanks, ballast tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, this examination is to be supplemented by thickness measurement and testing as required in **Par 4** and **Par 5**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(4) Cargo piping on deck and cargo and ballast piping within the spaces specified in (3) above are to be examined and “operationally tested to working pressure” to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

Special attention is to be given to any ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces, and Surveyors are to be advised on all occasions when this piping, including valves and fittings are opened during repair periods and can be examined internally. *(2021)*

Note : The term "operationally tested to working pressure" means the confirmation of the leakage or excessive vibration, etc.

(5) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

## 2. Tank protection *(2023)*

Where provided, the condition of the corrosion prevention system of cargo tanks is to be examined. A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion is found within the tank, or
- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

Thickness measurements are to be carried out as "deemed necessary" by the Surveyor.

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

## 3. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces specified in **401. 1** (2) (a) and (b) is to be carried out at each Special Survey. *(2020)*

(2) The minimum requirements for Close-up Survey at Special Survey are given in **Table 1.3.7.** The survey of stainless steel tanks may be carried out as an Overall Survey supplemented by Close-up Survey as "deemed necessary" by the Surveyor. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

(a) In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.

(b) In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

(4) For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of Close-up Surveys according to **Table 1.3.7** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

## 4. Extent of Thickness Measurement

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.3.8.** *(2022)*

(2) Provisions for extended measurements for areas with substantial corrosion are given in **Annex 1-5, Table 16** of the Guidance and as may be additionally specified in the survey programme as required in **102. 1.** These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken. *(2021)*

(3) The Surveyor may further extend the thickness measurements as "deemed necessary". *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(4) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurements according to **Table 1.3.8** may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating. *(2019)*

(5) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

(6) In case where two or three sections are to be measured, at least one is to include a ballast tank within 0.5 $L$ amidships.

### 5. Extent of tank testing *(2023)*

(1) The minimum requirements for tank testing at Special Survey are given in **Table 1.3.9.**

(2) Cargo tank testing carried out by the vessel's crew under the direction of the Master may be accepted by the Surveyor provided the following conditions are complied with:

(A) a tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, etc. has been submitted by the Owner and reviewed by the Society prior to the testing being carried out.

(B) there is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank.

(C) the tank testing has been satisfactorily carried out within Special Survey window not more than 3 months prior to the date of the survey on which the Overall or Close-up Survey is completed.

(D) the satisfactory results of the testing is recorded in the vessel's logbook.

(E) the internal and external condition of the tanks and associated structure are found satisfactory by the Surveyor at the time of the Overall and Close-up Survey.

Note : The guidance on pressure testing of boundaries of cargo oil tanks under direction of the master specified in **304. 6** of the Guidance is to be applied. *(2023)*

### 6. Chemical tankers over 10 years of age

(1) Selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks are to be:

(a) thickness measured at random or selected pipe lengths to be opened for internal inspection.
(b) pressure tested to the maximum working pressure.

(2) Special attention is to be given to cargo/slop discharge piping through ballast tanks and void spaces.

**Table 1.3.7 Minimum requirements for Close-up Survey at Special Survey of Chemical Tankers[1] *(2023)***
1) Single Skin Chemical Tankers

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. One web frame ring in a ballast wing tank (*A) | 1. All web frame rings in a ballast wing tank or double bottom ballast tank (*A) | 1. All web frame rings in all ballast tanks (*A) | 1. All web frame rings in all ballast tanks (*A) |
| 2. One deck transverse in a cargo tank or on deck (*B) | 2. One deck transverse in each remaining ballast tank or on deck (*B) | 2. All web frame rings in a cargo wing tank (*A) | 2. All web frame rings in a cargo wing tank (*A) |
| 3. One transverse bulkhead lower part in a ballast tank (*D) | 3. One deck transverse in a cargo wing tank or on deck (*B) | | |
| 4. One transverse bulkhead lower part in a cargo wing tank (*D) | 4. One deck transverse in two cargo centre tanks or on deck (*B) | 3. One web frame ring in each remaining cargo tank (*A) | 3. One web frame ring in each remaining cargo tank (*A) |
| 5. One transverse bulkhead lower part in a cargo centre tank[2] (*D) | 5. Both transverse bulkhead in a ballast wing tank (*C) | 4. All transverse bulkheads in all cargo tanks (*C) | 4. All transverse bulkheads in all cargo tanks (*C) |
| | 6. One transverse bulkhead lower part in each remaining ballast tank (*D) | 5. All transverse bulkheads in all ballast tanks (*C) | 5. All transverse bulkheads in all ballast tanks (*C) |
| | 7. One transverse bulkhead lower part in two cargo centre tanks[2] (*D) | | 6. Additional transverse areas as "deemed necessary by the Society" |
| | 8. One transverse bulkhead lower part in a cargo wing tank (*D) | | |

(NOTES)

1) (*A) to (*D) mean as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6** of the Guidance: *(2021)*

(*A) : Complete transverse web frame ring including adjacent structural members
(*B) : Deck transverse including adjacent deck structural members
(*C) : Transverse bulkhead complete including girder system and adjacent structural members
(*D) : Transverse bulkhead lower part including girder system and adjacent structural members

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

3) The term "deemed necessary by the Society" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

**Table 1.3.7 Minimum requirements for Close-up Survey at Special Survey of Chemical Tankers[1] (continued)** *(2023)*

2) Double Skin Chemical Tankers

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. One web frame ring in a ballast double hull tank[2] (*1)<br>2. One deck transverse in a cargo tank or on deck (*2)<br>3. One transverse bulkhead in a ballast tank[2] (*4)<br>4. One transverse bulkhead in a cargo wing tank (*5)<br>5. One transverse bulkhead in a cargo centre tank[3] (*5) | 1. All web frame rings in a ballast wing tank or ballast double hull tank[2] (*1)<br>2. The knuckle area and the upper part(3 metres approx) of one web frame in each remaining ballast tank (*6)<br>3. One deck transverse in two cargo tanks (*2)<br>4. One transverse bulkhead in each ballast tank[2] (*4)<br>5. One transverse bulkhead in two cargo centre tanks[3] (*5)<br>6. One transverse bulkhead in a cargo wing tank (*5) | 1. All web frame rings in all ballast tanks (*1)<br>2. All web frame rings in a cargo wing tank (*7)<br>3. One web frame ring in each remaining cargo tank (*7)<br>4. All transverse bulkheads in all cargo tanks (*3)<br>5. All transverse bulkheads in all ballast tanks (*4) | 1. All web frame rings in all ballast tanks (*1)<br>2. All web frame rings in a cargo wing tank (*7)<br>3. One web frame ring in each remaining cargo tank (*7)<br>4. All transverse bulkheads in all cargo tanks (*3)<br>5. All transverse bulkheads in all ballast tanks (*4)<br>6. Additional transverse areas as "deemed necessary by the Society" |

(NOTES)

1) (*1) to (*7) mean as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6** of the Guidance: *(2021)*

(*1) Web frame in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank(where fitted), including adjacent structural members. In fore and aft peak tanks web frame means a complete transverse web frame ring including adjacent structural members.

(*2) Deck transverse, including adjacent deck structural members(or external structure on deck in way of the tank, where applicable)

(*3) Transverse bulkhead complete in cargo tanks, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.

(*4) Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets.

(*5) Transverse bulkhead lower part in cargo tank, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower stool, where fitted.

(*6) The knuckle area and the upper part(3 metres approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.

(*7) Web frame in a cargo oil tank means deck transverse, longitudinal bulkhead structural elements and cross ties, where fitted, including adjacent structural members.

2) Ballast double hull tank means double bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.

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

4) The term "deemed necessary by the Society" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

**Table 1.3.8 Minimum requirements for thickness measurements at Special Survey of Chemical Tankers *(2023)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2) One transverse section<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.7** 1) or 2), as applicable<br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2) Two transverse sections[1)]<br>3) All wind and water strakes<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.7** 1) or 2), as applicable<br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br>2. Within the cargo area:<br>1) Each deck plate<br>2)Three transverse sections[1)]<br>3)Each bottom plate<br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.7** 1) or 2), as applicable<br>4. All wind and water strakes, full length |
| (NOTES)<br>1) At least one section is to include a ballast tank within 0.5 $L$ amidships. | | | |

**Table 1.3.9 Minimum requirements for tank testing at Special Survey of Chemical Tankers**

| Special Survey No. 1 | Special Survey No. 2 and Subsequent |
|---|---|
| 1. All ballast tank boundaries<br>2. Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, pump-rooms or cofferdams | 1. All ballast tank boundaries<br>2. All cargo tank bulkheads |
| (NOTES)<br>1. The Surveyor may extend the tank testing as "deemed necessary".<br>Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*<br>2. Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.<br>3. Boundaries of cargo tanks are to be tested to the highest point that liquid will rise under service conditions.<br>4. The testing of double bottom and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tanktop is carried out. | |

# Section 5 Double Hull Oil Tankers

## 501. General

### 1. Application

(1) In addition to the requirements specified in **Ch 2**, the requirements apply to surveys of hull structure and piping systems in way of the following spaces for all double hull oil tankers with ESP notation.

(a) cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area
(b) all ballast tanks

(2) The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when substantial corrosion and/or structural defects are found and include additional Close-up Survey "when necessary". *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

## 502. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **Ch 2, 201.**
(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. *(2019)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.
(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of the weather deck

(1) Examination of cargo tank openings including gaskets, covers, coamings and flame screens.
(2) Examination of cargo tanks pressure/vacuum valves and flame screens.
(3) Examination of flame screens on the open ends of air pipes to all bunker tanks.
(4) Examination of cargo, crude oil washing, bunker and vent piping systems, including vent masts and headers.

### 4. Examination of cargo pump rooms and pipe tunnels(if fitted)

(1) Examination of all pump rooms bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room bulkheads.

(2) Examination of the condition of all piping systems.

### 5. Examination of ballast tanks *(2023)*

Examination of "ballast tanks where required" as a consequence of the results of the Special Survey(See **504. 2**) and Intermediate Survey(See **503. 3**) is to be carried out. When "considered necessary by the Surveyor", or when extensive corrosion exists, thickness measurements are to be carried out and if the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 17** of the Guidance. These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

Note :
1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

**6.** For vessels built under IACS Common Structural Rules(**Pt 12** or **Pt 13**), the identified substantial corrosion areas are to be examined and additional thickness measurements are to be carried out.

## 503. Intermediate Survey

### 1. General

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **Ch 2, 301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) Double hull oil tankers exceeding 10 years of age up to 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **504.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied)

However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder as required in **106. 1** (2) are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** or **1** of the Guidance when requiring the pressure test or the longitudinal strength evaluation of hull girder.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, an under water survey may be considered in lieu of the requirements of **504. 1** (5).

(4) Double hull oil tankers over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in **102. 1** and **504.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied)

However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder as required in **106. 1** (2) are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 4** or **1** of the Guidance when requiring the pressure test or the longitudinal strength evaluation of hull girder.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, a survey in dry dock is to be a part of the Intermediate Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

(5) For vessels built under IACS Common Structural Rules(**Pt 12** or **Pt 13**), the identified substantial corrosion areas are to be examined and additional thickness measurements are to be carried out.

**2. For weather decks, an examination as far as applicable of:**

(1) Cargo, crude oil washing, bunker, ballast, steam and vent piping systems as well as vent masts and headers is to be carried out.

(2) If upon examination there is any doubt as to the condition of the piping, the piping may be required to be pressures-tested, thickness measured or both.

**3. Extent of examination**

The examination in Intermediate Survey is to be in accordance with the follows.

| 5 years 〈 age ≤ 10 years[1), 2)] | 10 years 〈 age ≤ 15 years | 15 years 〈 age |
|---|---|---|
| 1. Overall Survey of representative ballast tanks<br>2. Examination of suspect areas identified at previous surveys | **503. 1** (3) to be applied. | **503. 1** (4) to be applied. |

(NOTES)

1) If such inspections reveal no visible structural defects, the examination may be limited to a verification that the hard protective coating remains in GOOD condition.

2) A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion is found within the tank, or
- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

## 504. Special Survey

**1. General**

(1) The due range of Special Survey is to be in accordance with the requirements of **Ch 2, 401.**

(2) The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in (4), is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(3) All cargo tanks, ballast tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, this examination is to be supplemented by thickness measurement and testing as required in **Par 4** and **Par 5**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(4) Cargo piping on deck, including crude oil washing(COW) piping, cargo and ballast piping within the spaces specified in (3) above are to be examined and "operationally tested to working pressure" to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

Special attention is to be given to any ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces, and Surveyors are to be advised on all occasions when this piping, including valves and fittings are opened during repair periods and can be examined internally. *(2021)*

Note : The term "operationally tested to working pressure" means the confirmation of the leakage or excessive vibration, etc.

(5) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

**2. Tank protection** *(2023)*

Where provided, the condition of the corrosion prevention system of cargo tanks is to be examined. A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion is found within the tank, or
- the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

Thickness measurements are to be carried out as “deemed necessary by the Surveyor”.

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

**3. Extent of Overall and Close-up Survey**

(1) An Overall Survey of all spaces specified in **501. 1** (1) (a) and (b) is to be carried out at each Special Survey. *(2020)*

(2) The minimum requirements for Close-up Survey at Special Survey are given in **Table 1.3.10.**

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

(a) In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.

(b) In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

(4) For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of Close-up Surveys according to **Table 1.3.10** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

**4. Extent of thickness measurement**

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.3.11.**

(2) Provisions for extended measurements for areas with substantial corrosion are given in **Annex 1-5, Table 17** of the Guidance and as may be additionally specified in the survey programme as required in **102. 1.** These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 12** or **Pt 13**), the identified substantial corrosion areas are required to be examined and additional thickness measurements are to be carried out at Annual and Intermediate Surveys. *(2021)*

(3) The Surveyor may further extend the thickness measurements as “deemed necessary”. *(2023)*

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(4) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurements according to **Table 1.3.11** may be reduced by sufficiently confirming

the actual average condition of the structure under the coating. *(2019)*

(5) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

(6) In case where two or three sections are to be measured, at least one is to include a ballast tank within 0.5 $L$ amidships. In case of oil tankers of 130 m in length and upwards(i.e. length for freeboard($L_f$) as defined in **Pt 3, Ch 1, 103.**) and more than 10 years of age, for the evaluation of the ship's longitudinal strength as required in **106. 1** (2), the sampling method of thickness measurements is given in **Annex 1-5, 6** of the Guidance.

In case of ships built under IACS Common Structural Rules for Bulk Carriers and Oil Tankers(**Pt 13**), for the evaluation of the ship's longitudinal strength as required in **106. 1** (4), the sampling method of thickness measurements is given in **Annex 1-5, 6** of the Guidance. *(2021)*

### 5. Extent of tank testing *(2023)*

(1) The minimum requirements for tank testing at Special Survey are given in **Table 1.3.12**.

(2) Cargo tank testing carried out by the ship's crew under the direction of the Master may be accepted by the Surveyor provided the following conditions are complied with: *(2024)*

(A) a tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, etc. has been submitted by the Owner and reviewed by the Society prior to the testing being carried out.

(B) the tank testing is carried out prior to overall survey or close-up survey. *(2024)*

(C) the tank testing is carried out within the Special Survey window and not more than 3 months prior to the date on which the overall or close-up survey is completed. *(2024)*

(D) the tank testing has been satisfactorily carried out and there is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank. *(2024)*

(E) the satisfactory results of the testing is recorded in the ship's logbook. and *(2024)*

(F) the internal and external condition of the tanks and associated structure are found satisfactory by the Surveyor at the time of the Overall and Close-up Survey.

Note : The guidance on pressure testing of boundaries of cargo oil tanks under direction of the master specified in **304. 6** of the Guidance is to be applied. *(2023)*

**Table 1.3.10 Minimum requirements for Close-up Survey at Special Survey of Double Hull Oil Tankers[1] *(2023)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. One web frame, in a ballast tank[2] (*1) | 1. All web frames, in a ballast tank[2] (*1) | 1. All web frames, in all ballast tanks (*1) | 1. As for Special Survey No. 3 |
| 2. One deck transverse, in a cargo oil tank (*2) | 2. The knuckle area and the upper part (5 meters approximately) of one web frame in each remaining ballast tank (*6) | 2. All web frames, including deck transverse and cross ties, if fitted, in a cargo oil tank (*7) | 2. Additional transverse areas as "deemed necessary by the Society" |
| 3. One transverse bulkhead, in a ballast tank[2] (*4) | 3. One deck transverse, in two cargo oil tanks (*2) | 3. One web frame, including deck transverse and cross ties, if fitted, in each remaining cargo oil tank (*7) | |
| 4. One transverse bulkhead, in a cargo oil centre tank[3] (*5) | 4. One transverse bulkhead, in each ballast tank[2] (*4) | 4. All transverse bulkheads, in all cargo oil (*3) and ballast (*4) tanks | |
| 5. One transverse bulkhead, in a cargo oil wing tank (*5) | 5. One transverse bulkhead, in two cargo oil centre tanks[3] (*5) | | |
| | 6. One transverse bulkhead, in a cargo oil wing tank (*5) | | |

(NOTES)

1) (*1) to (*7) mean as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6, 1** (5) of the Guidance: *(2021)*

(*1) Web frame in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank(where fitted), including adjacent structural members. In fore and aft peak tanks web frame means a complete transverse web frame ring including adjacent structural members.

(*2) Deck transverse, including adjacent deck structural members(or external structure on deck in way of the tank, where applicable)

(*3) Transverse bulkhead complete in cargo tanks, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.

(*4) Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets.

(*5) Transverse bulkhead lower part in cargo tank, including girder system, adjacent structural members(such as longitudinal bulkheads) and internal structure of lower stool, where fitted.

(*6) The knuckle area and the upper part(5 metres approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.

(*7) Web frame in a cargo oil tank means deck transverse, longitudinal bulkhead structural elements and cross ties, where fitted, including adjacent structural members.

2) Ballast tank : Apart from the fore and aft peak tanks, the term "ballast tank" has the following meaning:

- all ballast compartments(hopper tank, side tank and double-deck tank, if separate from double-bottom tank) located on one side, i.e. portside or starboard side, and additionally double-bottom tank on port side plus starboard side, when the longitudinal central girder is not watertight and, therefore, the double bottom tank is a unique compartment from portside to starboard side; or
- all ballast compartments(double-bottom tank, hopper tank, side tank and double-deck tank) located on one side, i.e. portside or starboard side, when the longitudinal central girder is watertight and, therefore, the portside double-bottom tank separate from the starboard-side double-bottom tank.". *(2019)*

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

4) The term "deemed necessary by the Society" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

**Table 1.3.11 Minimum requirements for thickness measurements at Special Survey of Double Hull Oil Tankers *(2023)***

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect areas | 1. Suspect areas<br><br>2. Within the cargo area:<br>1) Each deck plate<br><br>2) One transverse section<br><br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.10**<br><br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br><br>2. Within the cargo area:<br>1) Each deck plate<br><br>2) Two transverse sections[1)]<br><br>3) All wind and water strakes<br><br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.10**<br><br>4. Selected wind and water strakes outside the cargo area | 1. Suspect areas<br><br>2. Within the cargo area:<br>1) Each deck plate<br><br>2) Three transverse sections[1)]<br><br>3) Each bottom plate<br><br>3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.10**<br><br>4. All wind and water strakes, full length |
| (NOTES)<br>1) At least one section is to include a ballast tank within $0.5L$ amidships. | | | |

**Table 1.3.12 Minimum requirements for tank testing at Special Survey of Double Hull Oil Tankers**

| Special Survey No. 1 | Special Survey No. 2 and Subsequent |
|---|---|
| 1. All ballast tank boundaries<br><br>2. Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, pump-rooms or cofferdams | 1. All ballast tank boundaries<br><br>2. All cargo tank bulkheads |
| (NOTES)<br>1. The Surveyor may extend the tank testing as "deemed necessary".<br>Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*<br>2. Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.<br>3. Boundaries of cargo tanks are to be tested to the highest point that liquid will rise under service conditions.<br><br>4. The testing of double bottom and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tank-top is carried out. | |

# Section 6 Double Skin Bulk Carriers

## 601. General

### 1. Application

(1) In addition to the requirements specified in **Ch 2**, the requirements apply to surveys of hull structure and piping systems in way of the following spaces for all double skin bulk carriers with ESP notation.

(A) cargo holds, cofferdams, pipe tunnels, void spaces, fuel oil tanks within the cargo length area
(B) all ballast tanks

(2) The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when Substantial Corrosion and/or structural defects are found and include additional Close-up Survey "when necessary". *(2023)*

Note : The term "when necessary" means the cases as specified in **Ch 1, 801. 5** of the Guidance.

(3) For some cargo holds of single side skin, and where IACS UR S19 or S30 is required to be complied, the requirements of **Sec 2** are to apply as applicable.

### 2. Definitions

(1) Refer to the Definitions of **Ch 2, Sec 1, 102.** *(2020)*

## 602. Annual Survey

### 1. General

(1) The due range of Annual Survey is to be in accordance with the requirements of **Ch 2, 201.**

(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, weather decks, hatch covers, coamings and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. *(2019)*

### 2. Examination of the hull

(1) Examination of the hull plating and its closing appliances as far as can be seen.
(2) Examination of watertight penetrations as far as practicable.

### 3. Examination of weather deck, hatch covers and coamings

(1) Confirmation is to be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

(2) A thorough survey of cargo hatch covers and coamings is only possible by examination in the open as well as closed positions and is to include verification of proper opening and closing operation.

As a result, the hatch cover sets within the forward 25 % of the ship's length and at least one additional set, such that all sets on the ship are assessed at least once in every 5-year period, are to be surveyed open, closed and in operation to the full extent on each direction at each Annual Survey, including:

(A) stowage and securing in open condition
(B) proper fit and efficiency of sealing in closed condition
(C) operational testing of hydraulic and power components, wires, chains, and link drives

The closing of the covers is to include the fastening of all peripheral and cross joint cleats or other securing devices. Particular attention is to be paid to the condition of the hatch covers in the forward 25% of the ship's length, where sea loads are normally greatest.

(3) If there are indications of difficulty in operating and securing hatch covers, additional sets above those required by (2), at the discretion of the Surveyor, are to be tested in operation.

(4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 4, Ch 2, Sec 5**. *(2019)*

(5) For each cargo hatch cover set, at each Annual Survey, the following items are to be surveyed:

(A) cover panels, including side plates, and stiffener attachments that may be accessible in the open position by Close-up Survey(for corrosion, cracks, deformation)

(B) sealing arrangements of perimeter and cross joints(gaskets for condition and permanent deformation, flexible seals on combination carriers, gasket lips, compression bars, drainage channels and non return valves)

(C) clamping devices, retaining bars, cleating(for wastage, adjustment, and condition of rubber components)

(D) closed cover locating devices(for distortion and attachment)
(E) chain or rope pulleys
(F) guides
(G) guide rails and track wheels
(H) stoppers
(I) wires, chains, tensioners, and gypsies
(J) hydraulic system, electrical safety devices and interlocks
(K) end and interpanel hinges, pins and stools where fitted

(6) At each hatchway, at each Annual Survey, the coamings, with plating, stiffeners and brackets are to be checked for corrosion, cracks and deformation, especially of the coaming tops, including Close-up Survey. *(2019)*

(7) Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 1** of the Guidance when requiring the tightness test.

(8) Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition, where applicable, of:

(A) wooden covers and portable beams, carriers or sockets for the portable beam, and their securing devices

(B) steel pontoons, including Close-up Survey of hatch cover plating
(C) tarpaulins
(D) cleats, battens and wedges
(E) hatch securing bars and their securing devices
(F) loading pads/bars and the side plate edge
(G) guide plates and chocks
(H) compression bars, drainage channels and drain pipes(if any)

(9) Examination of flame screens on the open ends of air pipes to all bunker tanks.

(10) Examination of bunker and vent piping systems, including ventilators.

### 4. Examination of cargo holds *(2021)*

The examination of cargo holds in Annual Survey is to be in accordance with the follows.

| | 10 years < age ≤ 15 years | 15 years< age |
|---|---|---|
| Overall Survey | Two selected cargo holds | All cargo holds |
| Others | All piping and penetrations in cargo holds, including overboard piping, are to be examined. | All piping and penetrations in cargo holds, including overboard piping, are to be examined. |

(NOTES)

1. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 18** of the Guidance. These increased thickness measurements are to be carried out before the Annual Survey is credited as completed.

   Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

   For vessels built under the IACS Common Structural Rules(**Pt 11** or **Pt 13**), the annual thickness gauging may be omitted where a hard protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in GOOD condition.

   Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 5. Examination of ballast tanks *(2023)*

Examination of “ballast tanks when required” as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that Substantial Corrosion is found, the extent of thickness measurements is to be increased in accordance with **Annex 1-5, Table 18** of the Guidance. These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect Areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the annual thickness gauging may be omitted where a hard protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in GOOD condition.

Note :

1) The term "ballast tanks when required" means the ballast tanks which are assigned to be internally examined at annual intervals from the results of Intermediate Survey or Special Survey.

2) The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 6. Additional Annual Survey requirements after determining compliance with SOLAS XII/12 and XII/13

(1) For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the Annual Survey is to include an examination and a test, at random, of the water ingress detection systems and of their alarms.

(2) For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the Annual Survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

### 7. Examination of double-side skin void spaces for bulk carriers exceeding 20 years of age and of 150 m in length and upwards *(2024)*

Examination of double-side skin void spaces, for bulk carriers exceeding 20 years of age and of 150 m in length and upwards, are to be carried out when required as a consequence of the results of the Special Survey (as required by **604. 2.** (4)) and Intermediate Survey (as required by **603. 1.** (4) (a)).

When considered necessary by the Surveyor, or when extensive corrosion exists, thickness measurements should be carried out.

If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with **Table 18** of **Annex 1-5.**

These extended thickness measurements should be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys should be examined.

Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.

For bulk carriers built under the IACS Common Structural Rules(**Pt 11** or **Pt 13**), the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.

## 603. Intermediate Survey

### 1. General

(1) The due range of Intermediate Survey is to be in accordance with the requirements of **Ch 2, 301.**

(2) At each Intermediate Survey, in addition to the requirements of the Annual Survey, the following items are to be surveyed. Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

(3) Double skin bulk carriers exceeding 10 years of age up to 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent to the previous Special Survey as required in **604.** and **102. 1.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied)

However, internal examination of fuel oil tanks and pressure testing of all tanks are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 6** or **4** of the Guidance when requiring the internal examination or the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, an under water survey may be considered in lieu of the requirements of **604. 1** (6).

(4) Double skin bulk carriers over 15 years of age, the following is to apply:

(a) The requirements of the Intermediate Survey are to be to the same extent to the previous Special Survey as required in **604.** and **102. 1.** (Caution : In this case, the requirements specified in **Ch 2, 403.** are not need to be applied)

However, internal examination of fuel oil tanks and pressure testing of all tanks are not required unless deemed necessary by the attending Surveyor. *(2023)*

Note : The Surveyor is to consider the cases specified in **Ch 1, 801. 6** or **4** of the Guidance when requiring the internal examination or the pressure test.

(b) In application of (a) above, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey in lieu of the application of **Ch 2, 401. 4** and **5.**

(c) In application of (a) above, a survey in dry dock is to be part of the Intermediate Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

## 2. Examination of ballast tanks

The examination of ballast tanks in Intermediate Survey is to be in accordance with the follows.

| 5 years< age ≤10 years[1), 2), 3)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|
| 1. Overall Survey of representative ballast tanks<br>2. Overall Survey and Close-up Survey of suspect areas identified at previous surveys | **603. 1** (3) to be applied. | **603. 1** (4) to be applied. |

(NOTES)

1) The selection is to include fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks. If such Overall Survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

2) Where a hard coating is found to be in less than GOOD condition, corrosion or other defects are found in ballast tanks or where a hard protective coating was not applied from the time of construction, the examination is to be extended to "other ballast tanks of the same type"*. *(2024)*

* "Other ballast tanks of same type" are to be applied as followings;
a) aft peak & fore peak shall be considered as same type.
b) In case other ballast tanks are not of identical construction, the additional tank(s) is(are) to be examined because the progression of corrosion is not only related to the construction type, and the corrosion prevention system and the history of usage of the tanks are to be considered.
c) In case of water ballast hold, all water ballast holds are surveyed.

3) In ballast tanks other than double bottom ballast tanks, where a hard protective coating is found to be in less than GOOD condition, and it is not renewed, or where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined and thickness measurements carried out as considered necessary at annual intervals. *(2024)*

When such breakdown of hard protective coating is found in double bottom ballast tanks, or where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied, the tanks in question may be examined at annual interval. When "considered necessary by the Surveyor", or where extensive corrosion exists, thickness measurements are to be carried out.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance. *(2023)*

### 3. Examination of cargo holds

The examination of cargo holds in Intermediate Survey is to be in accordance with the follow.

| 5 years< age ≤10 years[1)] | 10 years< age ≤ 15 years | 15 years< age |
|---|---|---|
| Overall Survey of all cargo holds | **603. 1** (3) to be applied. | **603. 1** (4) to be applied. |

(NOTES)

1) Where “considered necessary by the Surveyor” as a result of the Overall Survey, the survey is to be extended to include a Close-up Survey of those areas of structure in the cargo holds selected by the Surveyor.

Where the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

### 4. Extent of thickness measurements

(1) Double skin bulk carriers exceeding 5 years of age up to 10 years of age, the following is to apply:

(a) Thickness measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to Close-up Survey, where required as per preceding **Par 2** and **Par 3**.

(b) The extent of thickness measurement may be reduced by sufficiently confirming the actual average condition of the structure under the coating provided the Surveyor is satisfied by the Close-up Survey that there is no structural diminution and the hard protective coatings are found to be in a GOOD condition. *(2019)*

(c) Where Substantial Corrosion is found, the extent of thickness measurements is to be increased in accordance with the requirements of **Annex 1-5, Table 18** of the Guidance relating to the Rules. These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the identified substantial corrosion areas may be: *(2021)*

(i) protected by a hard protective coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in GOOD condition, or alternatively

(ii) required to be measured at annual intervals.

(d) Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

Note : For existing bulk carriers, where Owners may elect to coat or recoat cargo holds as noted above, consideration may be given to the extent of the Close-up Surveys and thickness measurement. Prior to the coating of cargo holds of existing ships, scantlings should be ascertained in the presence of a Surveyor.

(2) Double skin bulk carriers exceeding 10 years of age up to 15 years of age, **Par 1** (3) above is to apply.

(3) Double skin bulk carriers exceeding 15 years of age, **Par 1** (4) above is to apply.

## 604. Special Survey

### 1. General

(1) The due range of Special Survey is to be in accordance with the requirements of **Ch 2, 401.**

(2) The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests, and checks of sufficient extent to ensure that the hull and related piping, as required in (4), is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

(3) All cargo holds, ballast tanks, including double bottom and double side tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in **Par 5** and **Par 6**, to ensure that the structural integrity remains effective.

The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(4) All piping systems within the spaces specified in (3) above are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

(5) The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks. Where the hard protective coating in void space is found to be in a GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. (2022)

Note : For survey of automatic air pipe heads refer to **403. 1** (17).

(6) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

### 2. Space protection *(2024)*

(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found to be in less than Good condition and it is not renewed, or where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as “deemed necessary by the Surveyor”. *(2024)*

Note : The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(2) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating is applied, or where a hard protective coating has not been applied from the time of construction, the tanks in question may be examined at annual intervals. When “considered necessary by the Surveyor”, or where extensive corrosion exists, thickness measurements are to be carried out. *(2023)*

Note : The term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(3) Where a hard protective coating is provided in cargo holds, and is found in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

(4) For double-side skin void spaces bounding cargo holds for bulk carriers exceeding 20 years of age and of 150 m in length and upwards, where provided, the condition of the corrosion prevention system of void spaces shall be examined. Where a hard protective coating is found to be in POOR condition, and it is not renewed, or where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied from the time of construction, the void spaces in question shall be examined at annual intervals.

Thickness measurements shall be carried out as deemed necessary by the surveyor. *(2024)*

### 3. Hatch covers and coamings

In addition to the requirements in **602. 3** of the Annual Survey, the following items are to be surveyed.

(1) Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:

(A) stowage and securing in open condition;
(B) proper fit and efficiency of sealing in closed condition;
(C) operational testing of hydraulic and power components, wires, chains, and link drives.

(2) Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent.

(3) Close-up Survey and thickness measurement* of the hatch cover and coaming plating and stiffeners are to be carried out as given in **Table 1.3.13** and **Table 1.3.14.**

* Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.

### 4. Extent of Overall and Close-up Survey

(1) An Overall Survey of all spaces specified in **601. 1** (1) (a) and (b) is to be carried out at each Special Survey. Fuel oil tanks in the cargo length area are to be surveyed as follows: *(2020)*

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| - | One | Two | Half, minimum two |

(NOTES)

1. These requirements apply to tanks of integral (structural) type.
2. If a selection of tanks is accepted to be examined, then different tanks are to be examined at each Special Survey, on a rotational basis.
3. Peak tanks (all uses) are subject to internal examination at each Special Survey.
4. At Special Survey No. 3 and subsequent Special Surveys, one deep tank for fuel oil in the cargo area is to be included, if fitted.

(2) The minimum requirements for Close-up Survey at Special Survey are given in **Table 1.3.13.** 1) for double skin bulk carriers, excluding ore carriers and in **Table 1.3.13**, 2) for ore carriers, respectively.

(3) The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or details which have suffered defects in similar spaces or on similar ships according to available information.

(4) For areas in spaces where hard protective coatings are found to be in a GOOD condition, the extent of Close-up Survey according to **Table 1.3.13** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. (Refer also to **604. 2** (3)) *(2019)*

### 5. Extent of thickness measurements

(1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.3.14.**

(2) Provisions for extended measurements for areas with substantial corrosion are given in **Annex 1-5, Table 18** of the Guidance relating to the Rules and as may be additionally specified in the survey programme as required in **102. 1.** These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

For vessels built under IACS Common Structural Rules(**Pt 11** or **Pt 13**), the identified substantial corrosion areas may be: *(2021)*

(A) protected by a hard protective coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in GOOD condition, or alternatively

(B) required to be measured at annual intervals.

(3) The Surveyor may further extend the thickness measurements as deemed necessary.

Note : The term "deemed necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance.

(4) For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurement according to **Table 1.3.14** may be reduced by sufficiently confirming the actual average condition of the structure under the coating. (Refer also to **604. 2** (3)) *(2019)*

(5) Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements, one of which is to be in the amidships area.

(6) Representative thickness measurement to determine both general and local levels of corrosion in the transverse web frames in ballast tanks is to be carried out. Thickness measurement is also to be carried out to determine the corrosion levels on the transverse bulkhead plating.

The extent of thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating provided the Surveyor is satisfied by the Close-up Survey, that there is no structural diminution, and the hard protective “coating where applied remains efficient”. *(2021)*

Note : The term "coating where applied remains efficient" means the cases where the coatings are found in a GOOD condition.

### 6. Extent of tank testing

The minimum requirements for tank testing at Special Survey are given in **Table 1.3.15.**

### 7. Additional Special Survey requirements after determining compliance with SOLAS XII/12 and XII/13

(1) For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the Special Survey is to include an examination and a test of the all water ingress detection systems and of their alarms.

(2) For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the Special Survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

**Table 1.3.13 Minimum requirements for Close-up Survey at Special Survey for Double Skin Bulk Carriers**

1) Excluding ore carriers

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. 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) (*1) | 1. One transverse web with associated plating and longitudinals as applicable in each ballast tank (*1) | 1. All transverse webs with associated plating and longitudinals as applicable in each ballast tank (*1) | 1. All transverse webs with associated plating and longitudinals as applicable in each ballast tank (*1) |
| | 2. Forward and aft transverse bulkheads including stiffening system in a transverse section including topside, hopper side and double side ballast tanks on one side of the ship(i.e. port or starboard) (*1) | 2. All transverse bulkheads including stiffening system in each ballast tanks (*1) | 2. All transverse bulkheads including stiffening system in each ballast tanks (*1) |
| 2. Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 3. 25% of ordinary transverse frames for transverse framing system or 25% of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in the foremost double side tanks (*2) | 3. 25% of ordinary transverse frames for transverse framing system or 25% of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in all double side tanks (*2) | 3. All ordinary transverse frames for transverse framing system or all of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in all double side tanks (*2) |
| | 4. One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted (*3) | 4. All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 4. All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) |
| 3. All cargo hold hatch covers and coamings (platings and stiffeners) (*4) | 5. All cargo hold hatch covers and coamings (platings and stiffeners) (*4) | 5. All cargo hold hatch covers and coamings (platings and stiffeners) (*4) | 5. All cargo hold hatch covers and coamings (platings and stiffeners) (*4) |
| | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches (*5) | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches (*5) | 6. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches (*5) |

(NOTES)

1. (*1) to (*5) means as follows and are illustrated of the general drawing for Close-up Survey area in Annex 1-6, 1 (6) of the Guidance. *(2021)*
   - (*1) : Transverse web frame or watertight transverse bulkhead in topside, hopper side and double side ballast tanks. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members
   - (*2) : Ordinary transverse frame in double side tanks
   - (*3) : Cargo hold transverse bulkheads plating, stiffeners and girders
   - (*4) : Cargo hold hatch covers and coamings. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.
   - (*5) : Deck plating and under deck structure inside line of hatch openings between cargo hold hatches

2. Close-up Survey of transverse bulkheads to be carried out at four levels:
   - Level(a) : Immediately above the inner bottom and immediately above the line of gussets(if fitted) and shedders for ships without lower stool
   - Level(b) : 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
   - Level(c) : About mid-height of the bulkhead
   - Level(d) : 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

**Table 1.3.13 Minimum requirements for Close-up Survey at Special Survey for Double Skin Bulk Carriers (continued)** ***(2023)***

2) Ore carriers

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. One web frame ring complete including adjacent structural members in a ballast wing tank (*1) | 1. All web frame rings complete including adjacent structural members in a ballast wing tank (*1) | 1. All web frame rings complete including adjacent structural members in each ballast tank (*1) | 1. All web frame rings complete including adjacent structural members in each ballast tank (*1) |
| | 2. One deck transverse including adjacent deck structural members in each remaining ballast tank (*1) | 2. All transverse bulkheads complete, including girder system and adjacent structural members, in each ballast tank (*1) | 2. All transverse bulkheads complete, including girder system and adjacent structural members, in each ballast tank (*1) |
| | 3. Forward and aft transverse bulkheads complete, including girder system and adjacent structural members, in a ballast wing tank (*1) | 3. One web frame ring complete including adjacent structural members in each wing void space (*1) | 3. One web frame ring complete including adjacent structural members in each wing void space (*1) |
| 2. One transverse bulkhead lower part including girder system and adjacent structural members in a ballast tank (*1) | 4. One transverse bulkhead lower part, including girder system and adjacent structural members, in each remaining ballast tank (*1) | 4. Additional web frame rings in void spaces as "deemed necessary by the Society" (*1) | 4. Additional web frame rings in void spaces as "deemed necessary by the Society" (*1) |
| 3. Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted (*3) | 5. One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted (*3) | 5. All cargo hold transverse bulkhead, including internal structure of upper and lower stools, where fitted (*3) | 5. All cargo hold transverse bulkhead, including internal structure of upper and lower stools, where fitted (*3) |
| 4. All cargo hold hatch covers and coamings(plating and stiffeners) (*4) | 6. All cargo hold hatch covers and coamings(plating and stiffeners) (*4) | 6. All cargo hold hatch covers and coamings(plating and stiffeners) (*4) | 6. All cargo hold hatch covers and coamings(plating and stiffeners) (*4) |
| | 7. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches(*5) | 7. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches(*5) | 7. All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches(*5) |

(NOTES)

1. (*1), (*3), (*4) and (*5) means as follows and are illustrated of the general drawing for Close-up Survey area in **Annex 1-6, 1** (6) of the Guidance. *(2021)*
   (*1) : Transverse web frame or watertight transverse bulkhead in ballast wing tanks and void spaces. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members
   (*3) : Cargo hold transverse bulkheads plating, stiffeners and girders
   (*4) : Cargo hold hatch covers and coamings. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, Close-up Survey/thickness measurement shall be done of accessible parts of hatch covers structures.
   (*5) : Deck plating and under deck structure inside line of hatch openings between cargo hold hatches
2. Close-up Survey of transverse bulkheads to be carried out at four levels:
   Level(a) : Immediately above the inner bottom and immediately above the line of gussets(if fitted) and shedders for ships without lower stool
   Level(b) : 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
   Level(c) : About mid-height of the bulkhead
   Level(d) : 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. The term "deemed necessary by the Society" means the cases as specified in **Ch 1, 801. 5** of the Guidance. *(2023)*

**Table 1.3.14 Minimum requirements for thickness measurements at Special Survey of Double Skin Bulk Carriers**

| Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|
| 1. Suspect area | 1. Suspect area | 1. Suspect area | 1. Suspect area |
| | 2. Within the cargo length: | 2. Within the cargo length: | 2. Within the cargo length: |
| | 1) Two transverse sections of deck plating outside line of cargo hatch openings | 1) each deck plate outside line of cargo hatch openings | 1) each deck plate outside line of cargo hatch openings |
| | | 2) two transverse sections, one in the amidship area, outside line of cargo hatch openings | 2) three transverse sections, one in the amidship area, outside line of cargo hatch openings |
| | 3. Wind and water strakes in way of the two transverse sections considered above | 3) all wind and water strakes | 3) each bottom plate |
| | 4. Selected wind and water strakes outside the cargo length area | 3. Selected wind and water strakes outside the cargo length area | 3. All wind and water strakes, full length |
| | 5. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.13** 1) or 2), as applicable | 4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.13** 1) or 2), as applicable | 4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to **Table 1.3.13** 1) or 2), as applicable |

**Table 1.3.15 Minimum requirements for tank testing at Special Survey of Double Skin Bulk Carriers**

| No. of Special Survey / Tanks or spaces | Special Survey No. 1 | Special Survey No. 2 | Special Survey No. 3 | Special Survey No. 4 and Subsequent |
|---|---|---|---|---|
| All boundaries of ballast tanks, deep tanks and cargo holds used for water ballast within the cargo length area | ○ | ○ | ○ | ○ |

(NOTES)

1. For fuel oil tanks within the cargo length area, only representative tanks are to be pressure tested.
2. The Surveyor may extend the tank testing as deemed necessary.

   Where the term "deemed necessary" means the cases as specified in **Ch 1, 801. 4** of the Guidance. *(2023)*

3. Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.
4. Boundaries of ballast holds are to be tested with a head of liquid to near to the top of hatches.
5. Boundaries of fuel oil tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.
6. The testing of double bottom tanks and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tanktop is carried out.

2025

# Guidance Relating to the Rules for the Classification of Steel Ships

# Part 1

# Classification and Surveys

GA-01-E

KR

APPLICATION OF THE GUIDANCE RELATING TO THE RULES

This "Guidance Relating to the Rules for the Classification of Steel Ships" (hereafter called as the Guidance Relating to the Rules) is prepared with the intent of giving details as to the treatment of the various provisions for items required the unified interpretations and items not specified in the Rules, and the requirements specified in the Guidance Relating to the Rules are to be applied, in principle, in addition to the various provisions in the Rules.

As to any technical modifications which can be regarded as equivalent to any requirements in the Guidance Relating to the Rules, their flexible application will be properly considered.

# APPLICATION OF PART 1 "CLASSIFICATION AND SURVEYS"

1. Unless expressly specified otherwise, the requirements in the Guidance apply to ships for which the application for Classification Survey is submitted to the Society on or after 1 July 2025.
2. The amendments to the Guidance for 2024 version and their effective date are as follows;

**Effective Date 1 January 2025 (to ships contracted for construction)**

CHAPTER 1 CLASSIFICATION

Section 3 Classification Survey druing Construction

- **309.** has been newly added.

**Effective Date 1 January 2025**

CHAPTER 2 PERIODICAL AND OTHER SURVEYS

Section 6 Docking survey

- **603.** has been newly added.

ANNEX

Annex 1-1 Class Notations

- 1.1 ETA has been newly added,

**Effective Date 1 February 2025**

ANNEX

Annex 1-5 Thickness Measurement Method for Hull Structrual Membars

- Table 1 has been amended.

**Effective Date 10 March 2025**

ANNEX

Annex 1-1 Class Notations

- 1.1 ESR(D) has been newly added as Additional special feature notation.

**Effective Date 1 July 2025**

CHAPTER 2 PERIODICAL AND OTHER SURVEYS

Section 2 Annual survey

- 204.3 (1),(2) have been amended and newly added.

ANNEX

Annex 1-1 Class Notations

- 1.1 Remarks of Ship type for “Bulk Carrier” and for “Oil/Bulk/Ore Carrier” have been amended.
- 1.1 LSN has been newly added,
- 1.2 PMS(S) has been newly added.

Annex 1-5 Thickness Measurement Method for Hull Structrual Membars

- 2. (4) & (5) have been amended and (6) has been newly added.

Annex 1-7 Continuous Machinery Survey Procedure(CMS)

- 1. (1),(2),(5) has been amended.

Annex 1-8 Planned Maintenance System Procedure (PMS)

- 1. (6),(7) has been newly added.
- 3. has been newly added and 4. has been amended.

Annex 1-16 Procedures for Testing Tanks and Tight Boundaries

- PART A. 4. (2) (A) (d) has been amended.

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# CHAPTER 1 CLASSIFICATION

## Section 2 Class Notations

### 201. Class notations *(2021)* [See Rule]

**1.** The definitions of terms specified in **201.** (2) to (4) of the Rules are as follows. If the following definition are expressly provided by the flag administration, they are to follow the provided definition.

(A) Coastal service area : Water area within 20 Nautical miles(1 Nautical mile = 1852 m) of the shore
(B) Smooth water service area : Water area within lakes, rivers and harbours

**2.** In applications to **201.** (2) to (4) of the Rules, the following service restriction notations of hull, machinery and equipment shall be applied.

(1) Service restriction notations of hull

KRS 0 : Ships which have been built to comply with the following requirements for a limited service(i.e., coastal or smooth water service)

(A) Requirements specified in **Pt 3, Ch 1, 201.** (1) of the Guidance
(B) Requirements specified in **Ch 23, 202.** or **302.** of the **Rules for the Classification of Steel Barges**
(C) Requirements specified in **Pt 10, Ch 1, 201. 1** (1) to (3) and **2** (1) to (3) of the Guidance

(2) Service restriction notations of machinery

KRM 0 : Ships which have been built to comply with the following requirements for a limited service

(A) Requirements specified in **Pt 5, Ch 3, 203.** and **204. 2** of the Guidance
(B) Requirements specified in **Pt 6, Ch 1, 101. 1** (4) and (5) of the Guidance

(3) Service restriction notations of equipment

For ships which have been built to comply with the following requirements for a limited service (i.e., coastal or smooth water service), the notation of "C" or "S" shall be appended to the character of hull and/or machinery.

(A) C : Notation for coastal service
  (a) Hull equipment
    (i) Requirements specified in **Pt 3, Ch 1, 201.** (2) and (3) of the Guidance
    (ii) Requirements specified in **Pt 10, Ch 1, 201. 1** (4) and (5) of the Guidance
    (iii) Requirements specified in **Ch 23, 203.** of the **Rules for the Classification of Steel Barges**
  (b) Machinery equipment
    (i) Requirements specified in **Pt 5, Ch 1, 401. 1** / **Pt 8, Annex 8-3, 1** (3) (C) (b) / **Pt 5, Ch 6, 702. 2** (2), **802. 1** (2), **804. 1** (2) and **2** (1), **903. 1** (1) and (3) / **Pt 5, Ch 7, 204. 1** (2), **206. 1** (2), **207. 2** (2), **209. 2** (2), **301. 6** (2) and **Pt 5, Ch 8, 101. 1** (1) of the Guidance

(B) S : Notation for smooth water service
  (a) Hull equipment
    (i) Requirements specified in **Pt 3, Ch 1, 201.** (2), (3) and **Pt 4, Ch 8, 101. 1** of the Guidance
    (ii) Requirements specified in **Pt 10, Ch 1, 201. 2** (4) to (7) of the Guidance
    (iii) Requirements specified in **Ch 23, 303., 304., 305.** and **306.** of the **Rules for the Classification of Steel Barges**
  (b) Machinery equipment
    (i) Requirements specified in **Pt 5, Ch 1, 401. 1** / **Pt 5, Ch 6, 702. 2** (1), **802. 1** (1), **901. 5** (2), **903. 1** (1) / **Pt 5, Ch 7, 201. 1, 409.** and **Pt 5, Ch 8, 101. 1** (1) of the Guidance
    (ii) Requirements specified in **Ch 23, 307.** of the **Rules for the Classification of Steel Barges**

# Section 3 Classification Survey during Construction *(2023)*

## 302. Approval of plans 【See Rule】

**1.** The following contents shall be described in the drawings submitted to the Society for approval:

(1) Midship section

(A) Scantling draught($d_s$) or length of ship($L$) corresponding to $d_s$, where $d_s - d$(Load draught as defined in **Pt 3, Ch 1, 111.**) 〉 300mm(is to be also indicated in other Key plans). *(2017)*

(B) Kind of Freeboard to be assigned(is to be also indicated in other plans relating to the conditions of freeboard assignment).

(C) Position of freeboard deck in ships with multiple decks.

(D) Draught in meter corresponding to designed timber freeboard, where timber load line is intended to be marked.

(E) Deck load($\mathrm{KN/m^2}$) in ships carrying deck cargoes(including timbers).

(F) Loading condition(specific gravity, etc.) in bulk carriers.

(G) Length of ship($L$) specified in **Ch 2, 101.** of the Rules. *(2017)*

(2) Construction profile and deck plans

$L_f$(Length for freeboard as defined in **Pt 3, Ch 1, 103.**) and the points of fore/after end of $L_f$ or 0.25 $L_f$ from the fore end of $L_f$ *(2017)*

(3) Shell expansion

Comparison table between the standard sheer and actual sheer on the exposed deck(in case that exposed freeboard or superstructure deck has a well formed by bulwarks and end bulkheads of superstructure).

(4) Arrangements of scuppers

(A) Lines of 0.01 $L_f$ and 0.02 $L_f$ above the summer load line

(B) Line of 600 mm above the summer load line

(C) Line of 450 mm below the freeboard deck

**2. Omission and addition of plans and documents to be submitted**

(1) Submission of the plans and documents may be omitted in case where a sister ship is intended to be built. Where the omission is desired, the following plans in triplicate are to be submitted, together with a written request format. *(2022)*

(A) General arrangement
(B) Midship section
(C) Construction profile and deck plans
(D) Shell expansion
(E) Machinery arrangement of machinery space
(F) Shafting arrangement
(G) Machinery room piping diagram
(H) Electrical power diagram
(I) Revised plans for revision of original plans and corresponding original plans
(J) Revised plans where applicable requirements of the Rules are changed

(2) In application to (1), (I) and (J), calculation sheets are to be submitted, additionally. Where the omission of plans is accepted by the Society, the omitted plans shall be regarded as the same that approved for other ships.

(3) In case of other than (1), the submission of the plans and documents may be omitted also in accordance with (1) and (2) where it is desired to build the vessels based on the plans and documents which are already approved by the Society.

(4) Additional copies of the plans and documents may be required where the required attendance of the Surveyor is anticipated at more than one location.

### 3. Re-examination of plans in cases where freeboard is to be altered

Reassignment of a smaller freeboard, other than that corresponding to the designed draught($d$) may be desired due to allowance of the form freeboard found as a result of freeboard calculation. In such case, application for the intended draught($d_f$) is to be submitted to the Society with the following documents specifying the intended $d_f$ accompanied by calculation sheets on strength of hull members and on longitudinal hull strength for the desired $d_f$ as early as practicable.

(1) Where $d_f - d \leq 300\ \mathrm{mm}$ :
Application for re-examination of plans and documents for the increase of draught
Where $d_s \geq d_f$, this requirement may be ignored

(2) Where $d_f - d > 300\ \mathrm{mm}$ :
Application for re-examination of plans and documents for the increase of draught

(3) In case of above (2), the length of ship corresponding to $d_f$ is to be specified in the application for re-examination of plans and documents. In this case, key plans specifying the revised principal dimensions are to be re-submitted.

(4) The equipment number and the equipment are to comply with the requirements specified in **Pt 4, Ch 8** of the Guidance.

### 4. Examination and test plans *(2020)*

For approval or reference, the shipbuilder is to submit the examination and test plans including the followings to the Surveyor prior to the relevant examination and test.

(1) Approval
(A) Inspection and Test Plan(ITP)
(B) proposals for fit up examinations (where necessary)
(C) proposals for testing of the structure(leak and hydrostatic) as well as for all watertight and weathertight closing appliances
(D) proposals for non-destructive examination
(E) Procedure of stability experiment
(G) Procedure of Sea Trial
(H) The coating work specification and quality control scheme(including inspection of surface preparation and coating processes for ships with PSPC notation)
(I) Proposals for the examination of cargo handling appliances(where applicable)
(J) Onboard Test Procedure
(K) Hull Construction Monitoring Plan (where applicable)
(L) any other proposals specific to the ship type or to the statutory requirements(where applicable)

(2) Reference
(A) proposals for the examination of completed steelwork generally referred to as the block plan and are to include details of joining blocks together at the pre-erection and erection stages or at other relevant stages

## 304. Machinery installation[See Rule]

In application to **304.** of the Rules, the term "considered necessary by the Society" means the requirements specified in **Pt 6, Ch 2, 301. 1** and **2** of the Rules. (for CMA Ships or UMA Ships as defined in **Pt 9**, the requirements specified in **Pt 9, Ch 3, 203.** of the Rules are to be applied)

## 306. Tests[See Rule]

In application to **306.** of the Rules, the term "considered necessary tests" means the tests specified in **Pt 6, Ch 2, 302.** and **303.** of the Rules. (for CMA Ships or UMA Ships as defined in **Pt 9**, the requirements specified in **Pt 9, Ch 3, 204.** and **205.** of the Rules are to be applied) *(2021)*

## 309. In Case of Dual Class Vessel *(2025)* 【See Rules】

### 1. Plans to be submitted by the Shipyard to the Second Society

(1) Hull
- (A) General arrangement
- (B) Capacity plan
- (C) Hydrostatic curves
- (D) Loading manual, where required.
- (E) Damage stability calculation, where required.
- (F) Midship section
- (G) Construction profile and deck plans
- (I) Shell expansion
- (J) Transverse bulkheads
- (K) Rudder and Rudder stock construction
- (L) Hatches and hatch-closing arrangement (when hatch covers are provided)
- (M) For CSR vessels, plans showing, for each structural element, both as-built and renewal thicknesses and any thickness for "voluntary addition.
- (N) Plan of tank testing

(2) Machinery
- (A) Machinery arrangement of machinery space
- (B) Intermediate shaft, thrust shaft and propeller shaft
- (C) Propeller
- (D) Couplings and shaft alignment calculation
- (E) Main engines, propulsion gears and clutch systems (or manufacturer make, model and rating information)
- (F) For steam turbine vessels, main boilers, superheaters and economisers (or manufacturer make, model and rating information) and steam piping
- (G) Piping diagram
- (H) Electric wiring diagram
- (I) Steering gear systems piping and arrangements and steering gear manufacturer make and model information
- (J) Diagram of the air, sounding and overflow systems
- (K) Diagram of cooling systems (sea water and fresh water)
- (L) Diagram of fuel oil system
- (M) Diagram of the lubricating oil system
- (O) Diagram of the hydraulic systems intended for essential services or located in machinery spaces
- (P) Diagrams of sea water and / or freshwater piping systems
- (Q) Electrical power balance (main and emergency supply)
- (R) General specification for the automation of the ship
- (S) Detailed specification of the essential service systems
- (T) List of components used in the automation circuits, and references (manufacturer, type, etc.)
- (U) General diagram showing the monitoring and/or control positions for the various installations, with an indication of the means of access and the means of communication between the positions as well as with the engineers
- (V) Diagrams of the supply circuits of automation systems, identifying the power source
- (W) List of monitored parameters for alarm/monitoring and safety systems
- (X) Diagram of compressed air system

(3) Torsional vibration calculations.

(4) For vessel with ice class notation, plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting (or manufacturer make, model and rating information).

(5) For oil tankers, pumping arrangement at the forward and after ends and drainage of cofferdams and pump rooms.

(6) Additional plans required for UMA-ship
(A) Instrument and Alarm List
(B) Fire Alarm System
(C) List of Automatic Safety Functions (e.g. slowdowns, shutdowns, etc.)
(D) Function Testing Plan.

(7) Additional Documents required for approval of Alternative Design and Arrangements
(A) Document(s) of Approval of Alternative Design and Arrangements, if any.

(8) Expansion of the list of plans
This list shall be expanded depending on the type of ship under the responsibility of the Society.

**2.** Other requirements confirmed acceptable in accordance with its own Rules are to be followed with separate Instructions.

# Section 4 Classification Survey after Construction *(2023)*

## 401. Classification Survey after Construction 【See Rule】 *(2023)*

**1.** For ships intended to register with the Society, where it is deemed necessary to do a preliminary survey, due to the age and status of the ships, the preliminary survey is to be carried out prior to the commencement of the Classification Survey. The Classification Survey shall be carried out based on the results of the preliminary survey. In such case, certain survey items may be specially required by the Society.

**2.** In application to **401.** of the Rules, parts of hull, machinery, outfittings and equipment which, if necessary, are to be measured for actual scantlings are those necessary for record of particulars on hull and machinery of ship in review of register data.

**3.** In the case of Passenger Ships and Fishing Vessels that are TOC, the survey items of para. 1. and 2. of the Rules and above para 1. and 2. are to be applied.

However, the following survey may be applied to passenger ships of less than 5 years of age that are to be transferred of classification without alteration or modification from any Society which is subject to verification of compliance with QSCS(Quality System Certification Scheme) of IACS. *(2023)*

(1) Dock Survey
After reviewing the ship's age, operation history, previous repair history, etc., it may be replaced with In-water Survey in lieu of Docking Survey.

(2) Open-up survey of main and auxiliary engines
In case the open-up period recommended by the manufacturer is not exceeded after the previous open-up survey, the open-up survey is to be in accordance with **Ch. 2, 303. 1.~ 4.** of the Rules

(3) Survey of Propeller shaft and stern tube shaft
(A) For oil lubricated shafts or closed loop system fresh water lubricated shafts, the survey is to be carried out in accordance with **Ch 2, 702. 2** (2) of the Rules.

(B) For open system water lubricated shafts, the survey is to be carried out in accordance with **Ch 2, 703. 2** (2) of the Rules.

(4) Boiler Survey
The survey is to be carried out in accordance with **Ch 2, 802. 2** of the Rules.

**4.** Where the vessel has, during any portion of the five years prior to the request for classification being received, been previously classed by the Society or a Society subject to verification of compliance with QSCS and has not been subject to alteration or modification since class was withdrawn, the survey requirements may be specially considered but are not to be less than the following: *(2020)*

(1) for vessels previously classed with the Society - all overdue surveys and overdue conditions of class, or

(2) for vessels previously classed with a Society subject to verification of compliance with QSCS - surveys the same as those required by **403.** of the Guidance.

## 402. Submission of plans 【See Rule】

**1.** For the Classification Survey after Construction, the following plans and documents(except for (I) and (L) of (1)) of (1) through (5) are to be submitted for approval and (I), (L) of (1) and (6) are to be submitted for reference to the Society as well in advance.

Where deemed necessary by the Society, the list of plans and documents other than those specified below are to be notified to the owner and there are to be submitted to the Society. *(2020)*

(1) Hull : 3 copies (2 copies for (I), (J), (L), (N) and (O))
(A) General arrangement
(B) Midship section

(C) Construction profile and deck plans
(D) Shell expansion
(E) Transverse bulkheads
(F) Rudder and rudder stock construction
(G) Stern frame
(H) Hatches and hatch-closing arrangements(when hatch covers are provided)
(I) Capacity plan - for reference *(2020)*
(J) Loading manual (where required) *(2018)*
(K) Loading instrument test report(where required) *(2018)*
(L) Lines or equivalent (where required) - for reference *(2020)*
(M) Lumber storage plan (where assignment of timber freeboard is required)
(N) Stability information booklet (including hydrostatic curves or table)
(O) Damage stability calculation (where required)

(2) Machinery : 3 copies
(A) Machinery arrangement of machinery space
(B) Shafting arrangement
(C) Electric wiring diagram
(D) Power transmission systems, intermediate shaft, thrust shaft and propeller shaft
(E) Propeller
(F) Piping diagram
(G) Main engine, propulsion gears and clutch systems(or manufacturer make, model and rating information)
(H) Steering gear system piping and arrangements and steering gear manufacturer make and model information

(I) For steam turbine vessels, main boilers, superheaters and economisers(or manufacturer make, model and rating information) and steam piping

(J) For vessels less than two(2) years old, torsional vibration calculations are to be submitted
(K) Additional plans required for UMA-ship
- Instrument and alarm list
- Fire alarm system
- List of automatic safety functions(e.g. slowdowns, shutdowns, etc.)
- Function testing plan

(3) For vessels with ice class notation, plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting (or manufacturer make, model and rating information) are to be submitted.

(4) For oil tankers, pumping arrangement at the forward and after ends and drainage of cofferdams and pump rooms are to be submitted.

(5) Plans required in Flag Administration or Convention (where applicable) : 3 copies

(6) Others
(A) A copy of survey reports(including Ship's Particulars and Initial Records)
(B) Copies of Classification Certificate, Statutory Certificate and Certificate of Registry
(C) Others indicating the ship's history and other particulars if necessary

**2.** In case that the plans and documents considered equivalent to those specified in **Par 1** are submitted, they may be accepted at the discretion of the Society.

**3. Notice of review results of plans and documents**
Where examination of plans and documents specified in **Par 1** above, is made by the Society, the applicant will be notified of the results. In cases where insufficient information accompanies the submitted plans and documents, the Society may require onboard inspection.

## 403. Classification Survey of ships classed by other classes or TOC(Transfer of Classification) *(2020)* 【See Rule】

When a ship holding class with any Society which is subject to verification of compliance with QSCS(Quality System Certification Scheme) of IACS is intended for classification, plans and documents to be submitted and items to be surveyed etc., are listed as below. Where deemed necessary by the Society, the list of plans and documents other than those specified below are to be notified to the Owner and there are to be submitted for reference to the Society.

### 1. Plan and document

(1) Hull *(2020)* : 1 copy
- (A) General arrangement
- (B) Midship section
- (C) Construction profile and deck plans
- (D) Shell expansion
- (E) Transverse bulkheads
- (F) Rudder and Rudder stock construction
- (G) Hatches and hatch-closing arrangements(when hatch covers are provided)
- (H) Capacity plan
- (I) Loading manual (where required)
- (J) Lumber storage plan (where assignment of timber freeboard is required)
- (K) Stability information booklet (including hydrostatic curves or table)
- (L) Damage stability calculation (where required)
- (M) For vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13** of the Rules), plans showing, for each structural element, both as-built and renewal thicknesses and any thickness for "voluntary addition"

(2) Machinery : 1 copy
- (A) Machinery arrangement of machinery space
- (B) Shafting arrangement
- (C) Electric wiring diagram
- (D) Power transmission systems, intermediate shaft, thrust shaft and propeller shaft
- (E) Propeller
- (F) Piping diagram
- (G) Main engine, propulsion gears and clutch systems(or manufacturer make, model and rating information)
- (H) Steering gear system piping and arrangements and steering gear manufacturer make and model information
- (I) For steam turbine vessels, main boilers, superheaters and economisers(or manufacturer make, model and rating information) and steam piping
- (J) For vessels less than two(2) years old, torsional vibration calculations are to be submitted
- (K) Additional plans required for UMA-ship
  - Instrument and alarm list
  - Fire alarm system
  - List of automatic safety functions (e.g. slowdowns, shutdowns, etc.)
  - Function testing plan

(3) For vessels with ice class notation, plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting(or manufacturer make, model and rating information) are to be submitted.

(4) For oil tankers, pumping arrangement at the forward and after ends and drainage of cofferdams and pump rooms are to be submitted.

(5) Plans required in Flag Administration or Convention (where applicable) : 1 copy

(6) In accordance with the agreement of TOC, owner's authorization letter indicating that the Society may request the survey status and relevant documents from previous Society.
When ship Owner is going to change or is changed, Owner's authorization may be written by the Owner who requests at the Society the Classification Survey.

(7) Others
(A) A copy of survey reports (including Ship's Particulars and Initial Records)
(B) Copies of Classification Certificate, Statutory Certificate and Certificate of Registry
(C) Others indicating the ship's history and other particulars if necessary.
(D) Hull Executive Summary (where required)

(8) Additional documents required for approval of alternative design and arrangements
(A) Document(s) of approval of alternative design and arrangements are to be submitted, if any.

**2.** In case that the plans and documents considered equivalent to those specified in **Par 1** are submitted, they may be accepted at the discretion of the Society.

**3.** Where any of the following cases is applicable at the moment of Classification Survey of ships classed by other classes, the submission of plan and documents is to be in accordance with **402.** *(2018)*

(1) change of service area to higher grade
(2) alterations or conversions
(3) change of ship's use
(4) application of additional requirements due to change of ship's nationality.

**4. Classification Survey**

Classification Surveys may be, but are not required to be, credited as periodical surveys for maintenance of classification. Conditions of Class due for compliance at a specified periodical survey for maintenance of classification need not be carried out/complied with at a Classification Survey unless the Classification Survey is credited as the specified periodical survey for maintenance of classification or the Condition of Class is overdue. *(2020)*

(1) When a ship is classed by the Society as a results of transfer of class

(A) Notwithstanding the records indicating that all surveys are up-to-date, a Classification Survey is to be held as minimum technical requirements by the Society, the extent of which is to be based on the age of the vessel and the losing Society's class status as follows: However, the Society is to request, if necessary, more strict surveys than the following requirements according to the condition of ship.

(a) Hull Classification Survey

(i) For vessels of age less than 5 years the survey is to take the form of an Annual Survey.
(ii) For vessels between 5 and 10 years of age, the survey is to include the scope of an Annual Survey and inspection of a "representative number of ballast spaces"*****. *(2023)*
(iii) For vessels of 10 years of age and above but less than 20 years of age, the survey is to include the scope of an Annual Survey and inspection of a "representative number of ballast spaces"***** and cargo spaces, except for: *(2023)*

① For gas carriers, in lieu of internal inspection of cargo spaces, the following applies:

- Inspection of surrounding ballast tank(s) and void spaces, including external inspection of independent cargo tank(s) and associated supporting systems as far as possible;

- Review of cargo log books and operational record to verify the correct functioning of the cargo containment system.

② For oil tankers and chemical tankers of 10 years of age and above but less than 15 years of age, in lieu of an internal inspection of cargo tanks without internal stiffening and framing, inspections of surrounding ballast tank(s) and void spaces and deck structure, are to be applied. *(2024)*

***** Note : "Representative ballast tanks" include the fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks.

(iv) For vessels subject to ESP notation(Bulk carrier, Oil tanker and Chemical tanker, etc.), which are 15 years of age and above but less than 20 years of age, the survey is to have the scope of a Special Survey or an Intermediate Survey whichever is due next.

(v) For all vessels, which are 20 years of age and above, the survey is to have the scope of a Special Survey. This requirement is also applicable to the vessels having their hull under continuous survey.

(vi) In lieu of the requirements in items (i) through (v), the following apply for site specific purpose-built Floating Production and/or Storage Vessels:

① for vessels of age less than 5 years, the survey is to have the scope of an Annual Survey.

② for vessels of age between 5 and 10 years, the survey is to include the scope of an Annual Survey and inspection of 20 % of ballast tanks.

③ for vessels of age between 10 and 20 years, the survey is to include the scope of an Annual Survey, inspection of 20 % of ballast tanks and 20 % of cargo spaces.

④ for vessels of 20 years of age and above, the survey is to have the scope of a Special Survey.

(vii) The following apply for site specific purpose-built Floating Production and/or Storage Vessels which have been converted from other vessels.

① until 20 years have elapsed since conversion, the survey is to have the scope of an Annual Survey, inspection of 20 % of ballast tanks and 20 % of cargo spaces.

② after 20 years have elapsed since conversion, the survey is to have the scope of a Special Survey.

(viii) In the context of applying (iv) and (v) above, if a dry-docking of the vessel is not due at the time of Classification Survey of ships classed by other classes, consideration can be given to carrying out an underwater examination in lieu of dry-docking. *(2017)*

(ix) in the context of applying iv) and v), as applicable, the anchors and anchor chain cables ranging and gauging for vessels over 15 years of age is not required to be carried out as part of the Classification Survey unless the Classification Survey is being credited as a periodical survey for maintenance of class.

If the Classification Survey is to be credited as a periodical survey for maintenance of class, consideration may be given by the Society to the acceptance of the anchors and anchor chain cables ranging and gauging carried out by the losing Society provided they were carried out within the applicable survey window of the periodical survey in question.

(x) In the context of applying (i) to (viii) above, as applicable, consideration may be given by the Society to the acceptance of thickness measurements taken by the losing society provided;

① if the Classification Survey is to be credited as a periodical survey for maintenance of class, they were carried out within the applicable survey window of the periodical survey in question.

② if the Classification Survey is not to be credited as a periodical survey for maintenance of class, they were carried out;

- within 15 months prior to completion of Classification Survey when it is in the scope of a Special Survey,
- within 18 months prior to completion of Classification Survey when it is in the scope of an Intermediate Survey.

In ① and ② both cases, the thickness measurements are to be reviewed by the Society for compliance with the applicable survey requirements, and "confirmatory gaugings"* are to be taken to the satisfactory of the Society. *(2023)*

* Note : Where the scope of thickness measurements required by the Society is different from the scope of thickness measurements taken by the losing

Society, additional thickness measurements by the difference are to be carried out together with the confirmatory gaugings.

(xi) In the context of applying (iii) to (viii) above, as applicable, tank pressure testing for vessels over 15 years of age is not required to be carried out as part of the Classification Survey unless the Classification Survey is being credited as a periodical survey for maintenance of class. If the Classification Survey is to be credited as a periodical survey for maintenance of class, consideration may be given by the Society to the acceptance of the tank pressure testing carried out by the losing Society provided they were carried out within the applicable survey window of the periodical survey in question.

(xii) In the context of applying (i) to (viii) above, as applicable, compliance with IACS Unified Requirements that require compliance at the forthcoming due periodical surveys (such as S26(Strength and Securing of Small Hatches on the Exposed Fore Deck) and S27(Strength Requirements for Fore Deck Fittings and Equipment)) are not required to be carried out/completed as part of the Classification Survey unless the Classification Survey is credited as a periodical survey for maintenance of class.

(b) Machinery Classification Survey

A general examination of all essential machinery is to be held and included:

(i) The adjustment of all boiler, economizer and steam generator safety valves are to be verified and oil fuel burning equipment examined under working conditions.

(ii) All pressure vessels are to be identified with the submitted plans and/or certificates.

(iii) Insulation resistance, generator circuit breakers, preference tripping relays and generator prime mover governors are to be tested and paralleling and load distributing to be proved.

(iv) In all cases, navigation lights and indicators are to be examined under working condition and alternative source of supply to be verified.

(v) Bilge pumping and oil fuel burning installations, together with emergency fire pump and remote controls for oil valves, oil fuel pumps, lubricating oil pumps and forced draught fans are to be examined and tested under working conditions.

(vi) Recirculating and ice clearing arrangements are to be verified as conforming to Rule requirements(When ice class is required).

(vii) The main and all auxiliary machinery necessary for operation of the ship at sea together with essential controls and steering gear are to be tested under working conditions. Alternative means of steering are to be tested. A short sea trial may be held at the Surveyor's discretion if the ship has been laid up for a long period.

(viii) Initial start arrangements are to be verified.

(ix) In the case of oil tankers, the cargo oil system and electrical installation in way of dangerous spaces are to be checked for compliance with rule requirements. Where explosion protected electrical safe equipment is installed, the Surveyors are to confirm themselves that such equipment has been approved by a recognised authority.
The safety devices, alarms and essential instruments of inert gas system are to be verified and the plant generally examined to ensure that it does not constitute a hazard to the ship.

Note : For the transfer of class or adding class as a double classed vessel or a dual classed vessel at ship's delivery after completion of the new construction survey of other society, items (iii) and (ix) may be verified by reviewing the ship's record.

(B) For vessels less than 15 years of age, an Interim Certificate of Class, or other documents enabling the vessel to trade are not to be issued, until all relevant surveys specified in (A) above have been satisfactorily completed; until all overdue surveys and all overdue Conditions of Class previously issued against the subject vessel as specified to the Owner by the losing Society, have been completed and rectified by the Society. *(2020)*

For vessels 15 years of age and above, an Interim Certificate of Class, or other documents enabling the vessel to trade are not to be issued, until all relevant surveys specified in (A) above have been satisfactorily completed; until all overdue surveys and all overdue Conditions of Class previously issued against the subject vessel as specified to the Owner by the losing Society, have been completed and rectified by the losing Society. (*2020*)

When facilities are not available in the first port of survey, an Interim Certificate of Class may be issued to allow the vessel to undertake a direct voyage to a port where facilities are available to complete the surveys required in (A) above. In such cases, the surveys specified in (A) above are to be carried out to the maximum extent practicable at the first port of survey, but in no case less than the scope of annual hull survey and machinery surveys as required in (A) (b).

(C) The validity of the Interim Certificate of Class and the subsequent Certificate of Class is subject to any outstanding Conditions of Class previously issued against the vessel being completed by the due and as specified by the losing Society. Any outstanding Conditions of Class with their due dates are to be clearly stated on the: (*2020*)

(a) Interim Certificate of Class and/or class survey record available on board; and
(b) Survey status when the Certificate of Class is issued.

(D) Any additional information regarding outstanding surveys or Conditions of Class received from the losing Society is to be dealt with in accordance with above (B) and (C) as applicable. If this additional information is received after the Interim Certificate of Classification has been issued, any surveys or Conditions of Class which are overdue are to be dealt with at the first port of call: (*2020*)

(a) by the Society in vessels less than 15 years of age; or
(b) by the losing Society in vessels 15 years of age or over

(2) When a vessel is classed by the Society as a double classed vessel *(2020)*
(A) Classification Survey is to be carried out in accordance with the requirements of (1) (A) above taking account of the Conditions of Class of in the status provided by the first Society.

(3) When a vessel is classed by the Society as a dual classed vessel *(2020)*
(A) Classification Survey having the scope of an Annual Survey as a minimum is to be carried out.

(4) When a vessel is classed by the Society as a double classed vessel or a dual classed vessel at ship's delivery after completion of the new construction survey of other society, all relevant surveys specified in (1) (A) are to be carried out and satisfactorily completed.

**5.** When a vessel is withdrawing class of the other Society from a double class arrangement with the Society *(2020)*

(A) For vessels less than 15 years of age, all overdue Conditions of Class of the withdrawing Society are to be completed at the first port of call at which surveys can be carried out and all outstanding Conditions of Class of the withdrawing Society are to be completed by the due date of the withdrawing Society.

For vessels of 15 years of age and over, all overdue Conditions of Class of the withdrawing Society are to be completed by the withdrawing Society and all outstanding Conditions of Class of the withdrawing Society are to be completed by the due date of the withdrawing Society.

(B) The validity of the Certificate of Classification is subject to any outstanding Conditions of Class previously issued against the vessel by the withdrawing Society being completed by the due date and as specified by the withdrawing Society. Any outstanding Conditions of Class with their due dates are to be clearly stated on the:

(a) class survey record if available on board; and
(b) survey status

(C) Any additional information regarding Conditions of Class received from the withdrawing Society is to be dealt with in accordance with above (A) and (B) as applicable.

If this additional information is received from the withdrawing Society after the Interim

Certificate of Classification has been issued or the confirmation of the validation of the Certificate of Classification has been done, any Conditions of Class which are overdue are to be dealt with at the first port of call at which surveys can be carried out by the relevant Society, depending on the age of the vessel.

(D) When facilities are not available in the first port of survey, a direct voyage to a port where facilities are available may be accepted to complete surveys for overdue Conditions of Class of the withdrawing Society.

## Section 8 Competence and Duties of Surveyors

### 801. Competence of Surveyors 【See Rule】

#### 1. Request of additional survey

The Surveyor may request additional surveys even though they are not specified as the survey items for the relevant kind of survey or may increase the extent of the relevant survey considering the following items and so on, if deemed necessary by the Surveyor.

(1) where abnormality is suspect from the survey on the survey items for the relevant kind of survey
(2) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
(3) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
(4) information from the records of maneuvering, operation, maintenance, measurement, etc. and information from the ship(ship officers, crews) or maker
(5) the relevant technical information on defects from similar ships or similar survey objects according to available information

#### 2. Request of non-destructive examination

The Surveyor may request non-destructive examinations or may increase the extent of the non-destructive examinations considering the following items and so on, if deemed necessary by the Surveyor.

(1) where injurious defect is evident or suspect at surface and/or inside of materials, welding or repaired defect, etc.
(2) the areas where workmanship is suspect, where new manufacture/welding methods have been adopted, where defects are liable to occur easily, where working conditions such as accessability are not good, etc.
(3) items specified in **1.** (1) to (5) above

#### 3. Request of thickness measurement

The Surveyor may request thickness measurements or may increase the extent of the thickness measurements considering the following items and so on, if deemed necessary by the Surveyor.

(1) where wastage is evident or suspect
(2) where considered to be prone to rapid wastage
(3) where there is no hard protective coating or abnormality in hard protective coating condition such as breakdown of coating, etc. is evident or suspect *(2019)*
(4) items specified in **1.** (1) to (5) above

#### 4. Request of pressure test

The Surveyor may request pressure tests or may increase the extent of the pressure tests considering the following items and so on, if deemed necessary by the Surveyor.

(1) where abnormality is suspect from the external examination
(2) where applicant has not carried out sufficient self-inspection for leak test which is adopted instead of pressure test

(3) items specified in **1.** (1) to (5) above

**5. Request of Close-up Survey**

The Surveyor may request Close-up Surveys or may increase the extent of the Close-up Surveys considering the following items and so on, if deemed necessary by the Surveyor.

(1) where abnormality such as substantial corrosion or structural defects, etc. is suspect from the Overall Survey
(2) the maintenance of the relevant space and the condition of the corrosion prevention system
(3) items specified in **1.** (1) to (5) above

**6. Request of open-up survey, internal examination and/or performance test**

The Surveyor may request open-up surveys, internal examinations and/or performance tests or may increase the extent of the open-up surveys, internal examinations and/or performance tests considering the following items and so on, if deemed necessary by the Surveyor.

(1) where abnormality is suspect from the external examination and/or operation test
(2) items specified in **1.** (1) to (5) above

**7.** If the Surveyor considers the working conditions are unsafe or encounters the working conditions that may compromise the safety of the Surveyor, the Surveyor may stop or refuse surveys immediately until the working conditions are safe to do so.

# CHAPTER 2 PERIODICAL AND OTHER SURVEYS *(2023)*

## Section 2 Annual Survey

### 202. Hull, equipment and fire-extinguishing appliances

**1.** In application to **202. 2** of the Rules, the following items are to be surveyed. **【See Rule】** *(2017)*

(1) Examining the fire pumps, fire main, hydrants, hoses and nozzles and the international shore connection and checking that each fire pump, including the emergency fire pump, can be operated separately so that two jets of water are produced simultaneously from different hydrants at any part of the ship whilst the required pressure is maintained in the fire main.

(2) Checking the provision and randomly examining the condition of the portable and non-portable fire extinguishers.

(3) Confirming that the fire fighter's outfits and emergency escape breathing devices(EEBDs) are complete and in good condition and that the cylinders, including the spare cylinders, of any required self contained-breathing apparatus are suitably charged, and that on board means of recharging breathing apparatus used during drills or a suitable number of spare cylinders to replace those used are provided, and provision of two-way portable radiotelephone apparatus of an explosion-proof type or intrinsically safe. (SOLAS 74/00/12, Reg.II-2 /10.10) *(2017)*

(4) Checking the operational readiness and maintenance of fire fighting systems. (SOLAS 74/00 Reg.II-2/14) (SOLAS 74/88/91 Reg.II-2/21) *(2021)*

(5) Examining the fixed fire fighting system for the machinery, cargo, vehicle, special category and ro-ro spaces, as appropriate, and confirming that its means of operation is clearly marked.

(6) Examining the fire-extinguishing and special arrangements in the machinery spaces and confirming, as far as practicable and as appropriate, the operation of the remote means of control provided for the opening and closing of the skylights, the release of smoke, the closure of the funnel and ventilation openings (Conducting internal inspection, and if deemed necessary by the Society's Surveyor, an overhaul inspection is to be carried out), the closure of power operated and other doors, the stopping of ventilation and boiler forced and induced draft fans and the stopping of oil fuel and other pumps that discharge flammable liquids. *(2021)*

(7) Checking that fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces and cargo pump-rooms, where applicable, are provided with two separate controls, one for opening of the gas piping and one for discharging the gas from the storage container, each of them located in a release box clearly identified for the particular space.

(8) Examining, as far as possible, and testing, as feasible, any fire detection and alarm system and any sample extraction smoke detection system.

(9) Examining the fire-extinguishing systems for spaces containing paint and/or flammable liquids and deep-fat cooking equipment in accommodation and service spaces.

(10) Examining the helicopter facilities.

(11) Examining the arrangements for remote closing of valves for oil fuel, lubricating oil and other flammable oils and confirming, as far as practicable and as appropriate, the operation of the remote means of closing the valves on the tanks that contain oil fuel, lubricating oil and other flammable oils.

(12) Examining and testing of the general emergency alarm system.

(13) Examining, where applicable, the alternative design and arrangements for fire safety appliances and arrangements, in accordance with the test, inspection and maintenance requirements, if any, specified in the approved documentation. *(2017)*

(14) Examining, when appropriate, the special arrangements for carrying dangerous goods, including checking the electrical equipment and wiring, the ventilation, the provision of protective clothing and portable appliances and the testing of the water supply, bilge pumping and any water spray system. *(2017)*

(15) For ships designed to carry containers on or above the weather deck, as applicable, examining the water mist lance, and as appropriate, the mobile water monitors and all necessary hoses, fittings and required fixing hardware. *(2020)*

(16) Examining and testing the portable gas detectors suitable for the detection of the gas fuel, for vehicle carriers carrying motor vehicles with compressed hydrogen or natural gas in their tanks for their own propulsion as cargo. *(2020)*

### 203. Machinery, electrical installations and additional installations

**1.** In application to **203. 22** of the Rules, the term "considered satisfactory by the Surveyor" means the other cases except for the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**2.** In application to **203. 26** of the Rules, the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**3.** In application to **203. 27** of the Rules, where the electrical distribution system on board a ship includes harmonic filters but facilities to continuously monitor harmonic distortion levels experienced on the main busbar are not fitted, following requirements for measurement of the harmonic distortion levels are to be applied. *(2017)* **【See Rule】**

(1) Harmonic distortion levels are to be measured as close to the Annual Survey as possible so as to give a clear representation of the condition of the entire plant to the Surveyor. *(2017)*

(2) Harmonic distortion readings are to be carried out when the greatest amount of distortion is indicated by the measuring equipment. *(2017)*

(3) An entry showing which equipment was running and/or filters in service is to be recorded in the log so this can be replicated for the next periodical survey. *(2017)*

(4) Harmonic distortion levels are also to be measured following any modification to the ship's electrical distribution system or associated consumers by suitably trained ship's personnel or from a qualified outside source. *(2017)*

### 204. Additional requirements to ship types

**3. Liquefied gas carriers : *(2025)***

(1) In application to **204. 3** (53) of the Rules, for liquefied gas carriers that do not have a cargo pump room, the emergency lights in the cargo compressor room are inspected (if fitted).

(2) In application to **204. 3** (55) of the Rules, application of appropriate protective screens/devices to prevent the passage of flame should be considered to **Pt 7, Ch 5, 802. 15** of the Rules. **【See Rule】** *(2024)*

## Section 3 Intermediate Survey *(2023)*

### 303. Machinery, electrical installations and additional installations *(2021)*

**1.** In application to **303. 1** (1) of the Rules, the term "deemed unnecessary by the Surveyor" means the other cases except for the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**2.** In application to **303. 2** (1) and (1) (A) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**3.** In application to **303. 2** (2) of the Rules, high-rotating-speed internal combustion engines of specific construction refer to those which comply with the formulae below and which can not be included in a survey of the crankshaft and bearings without complete engine overhaul. **【See Rule】**

$$C_s = \frac{S \cdot n^2}{1.8 \times 10^6} \geq 90, \qquad V = \frac{\pi \cdot d \cdot n}{6 \times 10^4} \geq 6$$

where,

$S$ : Stroke (mm)
$n$ : Maximum continuous revolution (rpm)
$d$ : Diameter of crankshaft journal (mm)

**4.** In application to **303. 2** (3) of the Rules, "the Guidance" means that it is to be confirmed that the requirements specified in **902. 2** apply to the ship. **【See Rule】**

**5.** In application to **303. 3** of the Rules, the following items are to be opened up and examined. Nevertheless the extent of items may specially considered in accordance with the manufacturer's maintenance manual. *(2018)* **【See Rule】**

(1) Casing, rotor, disc, impellers and blades of turbines, compressors, combustion chambers, burners
(2) shaft and flexible coupling

**6.** In application to **303. 5** of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**7.** In application to **303. 6** of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

### 304. Additional requirements to Ship types 【See Rule】

In application to **304. 3** (9) of the Rules, Non-metallic membranes of pressure relief valves for cargo tanks, in principle, should be inspected every three(3) years and then replaced with new ones when they are showing probability of hardening or malfunction. However, Non-metallic membranes are may be permitted to use exceeding three(3) years subject to comply with the following inspections.

(1) To be confirmed that the function test of the pressure relief valve is carried out and found in good order. However, where deemed necessary by the surveyor in accordance with **Ch 1, 801.** of the Guidance, the open-up survey is to be carried out.

(2) To be confirmed that, on the basis of log-book or crew's statement, no leakage from the pressure relief valves during the voyage has been occurred.

(3) As a result of the examination (1) and (2) above, it is to be verified that the surface and the function of the pressure relief valves are satisfactory.

## Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)

### 401. Due range *(2023)*

**1.** In application to **401. 8** (7) of the Rules, the Society is to consider following items and so on when withdraw the approval of Continuous Survey System of hull at the discretion of the Society. **【See Rule】**

(1) where Continuous Survey of hull has not been carried out satisfactorily
(2) When the Continuous Survey of hull item(s) due or overdue at the time of Annual Survey is not surveyed, or postponed by agreement
(3) where withdrawal of the Continuous Survey System of hull is requested by the Owner
(4) the results of reconsideration for adoption of the approved Continuous Survey System of hull where the Owner is changed

### 403. Requirements of survey

**1.** In application to **Table 1.2.2** of the Rules, the Surveyor is to consider following items and so on when require to remove ceilings, sparrings, wood linings/wood planks, floor plates and/or insulations, etc. **【See Rule】**

(1) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
(2) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
(3) where wastage is evident or suspect
(4) where considered to be prone to rapid wastage

**2.** In application to **Table 1.2.2** of the Rules, "considered necessary by the Surveyor" for thickness measurements means the cases as specified in **Ch 1, 801. 3** of the Guidance. **【See Rule】**

**3.** In application to **403. 1** (1) of the Rules, in case that all of the following conditions are satisfied, it may be replaced by In-water Survey in lieu of Docking Survey. *(2021)* **【See Rules】**

(1) Approval by the relevant flag state
(2) In case previous bottom survey between Special Surveys was carried out at dry dock and the next scheduled bottom survey between Special Surveys to be carried out at dry dock.
(3) Completion of the entire scope of Special Survey including internal examination of spaces, thickness measurement, gauging of chain cables and repairs when defects are found.

Note : However, the following ships are to be excluded.

1) Ships which Docking Survey is to be carried every year.
2) General dry cargo ships, Liquefied gas carriers and ships subject to the enhanced survey programme(ESP)
3) Ships subject to Korean Ship Safety Act

**4.** In application to **403. 1** of the Rules, for ships which are to be comply with **Annex 7-8, 3** of the Guidance as a safety measure for container ships incorporating extremely thick steel plates, NDT is to be carried out in accordance with **Annex 7-8, 3** and **Table 1** of the Guidance at No. 2 Special Survey and every even Special Survey after that(e.g. No.4, No. 6 Special Survey, etc.). However, for ships contracted for construction on or after 1 January 2020, above requirement is not applied. *(2020)* **【See Rule】**

## Section 5-1 Special Survey (Machinery, Electrical Installations and Additional Installations)

### 502. Requirements of survey

**1.** In application to **502. 1** (1) (a) of the Rules, where total running hours for an internal combustion engine is confirmed and found in satisfactory by the Surveyor, the survey may be extended until next overhauling hours recommended by the manufacturer since the previous overhauling survey. However, the interval is not to exceed 5 years from the date of the previous overhauling survey. And the survey item of essential valves and valve arrangements are to be included the isolating non-return valve for starting air mains against explosion as specified in **Pt 5, Ch 2, 203. 9** of the Rules. **【See Rule】**

**2.** In application to **502. 1** (1) (b) of the Rules, "the Guidance" means the following.

(1) The definition of high-rotating-speed internal combustion engine is to be in accordance with **303. 3** of the Guidance, and the due date of survey is same as **Par 1** above.
(2) Examination for high-rotating-speed internal combustion engines is to be done by the requirement specified in **502. 1** (1) (a) of the Rules, but the measurement for crank web deflections may be dispensed with. **【See Rule】**

**3.** In application to **502. 1** (1) (d) of the Rules, "the Guidance" means the survey method in accordance with the manufacturer's maintenance manual. Nevertheless the extent of items may specially considered in accordance with the manufacturer's maintenance manual. Engines for passenger ships may also be overhauled(or opened up) in accordance with **902. 2.** (2) of the Guidance. *(2018)* **【See Rule】**

(1) Casing, rotor, disc, impeller and blades of turbines, compressors, combustion chambers, burners
(2) shaft and flexible coupling

4. In application to **502. 1.** (1) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

5. In application to **502. 2** (2) to (5), (8), (10) and (12) of the Rules, the terms "deemed necessary by the Surveyor" and "considered necessary by the Surveyor" mean the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

6. In application to **502. 2** (9) (a) and (c) of the Rules, the terms "deemed necessary by the Surveyor" and "considered necessary by the surveyor" mean the cases as specified in **Ch 1, 801. 4** and/or **6** of the Guidance. In application to **502. 2** (9) (b) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Pt 5, Ch 6, 1305.** of the Rules when open-up surveys are carried out. **【See Rule】**

7. In application to **502. 2** (9) (b) of the Rules, open type coolers which are of air-cooled type and not of shell-and-tube type are to be examined externally instead of open-up survey. **【See Rule】**

8. In application to **502. 2** (12) of the Rules, the term "as necessary" means the cases as specified in **Ch 1, 801. 3** of the Guidance. **【See Rule】**

9. In application to **502. 3** (4) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

## Section 6 Docking Survey

### 601. Due range 【See Rule】

The docking survey intervals for passenger ship engaged on international voyages are to be subject to the relevant requirements of the International Convention for Safety of Life at Sea. But in five-year Special Survey period two times of Docking Survey with an interval not exceeding 36 months from the completion date of the previous Docking Survey and three times of In-water Survey specified in **604.** of the Rules in lieu of the Docking Survey may be carried out. However, where specific requirements are provided by the Administration the relevant requirements are to be applied.

### 603. Application of Valve and Cock Opend-up Inspection

In application to **603. 4** of the Rules, the opened-up inspection of valves and cocks on ships subject to the EDD (Extended Dry-docking interval system) may be conducted once within a 7.5-year period. *(2025)*

### 605. Extended Dry-docking Interval System

1. In application to **605. 2.** (7) of the Rules, the term "The hull below load waterline is to be free of any Condition of Class" means there is no damage or deterioration below the load waterline that requires repairs affecting vessel's fitness for continued service. **【See Rule】** *(2022)*

# Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.

## 701. General *(2021)* 【See Rule】

1. In application to **701. 3** (15) of the Rules, reference for Fresh water sample test is made to IACS Rec.36(Recommended procedure for the determination of contents of materials and other contaminants in stern tube lubricating oil).

2. In application to **701. 3** (19) of the Rules, a ships with oil lubricated stern tube bearing applying an approved Condition Monitoring Scheme is to be comply with the followings and is to be assigned an additional installation notation of STCM. **【See Rule】** *(2017)*

   (1) The following systems are to be provided and relevant drawings are to be submitted for approval.

   (A) At the aft stern tube bearing, two temperature sensors are to be provided, or if only one temperature senor is provided, a spare temperature sensor which can be replaced easily is to be provided when the using sensor is out of order.
   (B) Measurement of bearing weardown is to be provided.
   (C) Oil seals devices are to be such that can be renewed without removal of propeller.

   (2) The following are carried out at each shaft survey due date required by **702. 3** (1) of the Rules
   (A) For Method 2, survey required by **702. 1** (2) (A) or (B), (C) (D) (E) (F) and (G) of the Rules. *(2021)*
   (B) For Method 3, survey required by **702. 1** (3) (A) (B) (C) (D) and (E) of the Rules. *(2021)*

   (3) The Surveyor confirms at the periodical survey that parameters in the following condition monitoring records are within permissible limits.

   (A) lubricating oil analysis specified in **701. 3** (14)
   (B) Lubricating oil consumption
   (C) Aft stern tube bearing temperatures
   (D) Bearing weardown measurement

## 702. Oil Lubricated shafts or Closed Loop System Fresh Water Lubricated Shafts 【See Rule】

1. In application to **702. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used.

2. In application to **702. 1** (2) of the Rules, where the entire withdrawal of propeller shaft is not required and the survey may be carried out on the state that propeller is moved in the possible range, the propeller need not be entirely removed. However, where considered necessary by the Surveyor, the entire removal may be required. *(2017)*

3. In application to **702. 1** (1) and (2) of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance. *(2017)*

## 703. Open System Water Lubricated Shafts 【See Rule】

1. In application to **703. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used.

2. In application to **703. 1** (1) of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance. *(2017)*

# Section 8 Boiler Survey

## 802. Survey items

**1.** In application to **802. 1** and **4** of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 1** of the Guidance and includes the following items: **【See Rule】**

(1) The measurements of the thickness of boiler plates and tubes, and diameter of stays.
(2) The hydrostatic test at a pressure above the allowable pressure after the repairs of boiler is carried out.
(3) For the unfired steam generators, exhaust gas heaters and steam reservoirs or similar pressure vessels for the purpose of processing fishes, the same examination as the requirements specified for boilers.

**2.** In application to **802. 1** of the Rules, the Surveyor is to consider following items and so on when require to remove parts of lagging. **【See Rule】**

(1) where abnormality such as record or indication of abnormal deterioration, etc. is suspect
(2) where substantial corrosion, significant deformation, fracture, damage or other defect is evident or suspect
(3) where wastage is evident or suspect
(4) where considered to be prone to rapid wastage

**3.** In application to **802. 1** (1) of the Rules, the term "considered necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. **【See Rule】**

**4.** In application to **802. 3** of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 2** of the Guidance. **【See Rule】**

## 803. Survey of ships monitoring boiler condition *(2021)*

### 1. General

(1) For ships operating on approved PMS survey scheme, the BCM notation as an additional special feature notation may be assigned provided that boilers are fitted with monitoring systems and alarm systems and maintained in accordance with **Par 2.**
(2) The additional class notation BCM may be assigned for oil/gas fired boilers, exhaust gas boilers and steam generators to new ships or exisiting ships.
(3) For ships having the BCM notation, the alternative survey carried out by the chief engineer may be accepted for water-steam side of boiler at alternate boiler surveys specified in **803.** of Rules.
(4) Documentation is to be submitted as following.
  (A) Salinometers, oil content meters in the feed water/condensate water systems, sampling points and period and method of sampling. (for approval)
  (B) In case of an exhaust gas boiler, the arrangement of the exhaust gas differential pressure monitoring device. (for approval)
  (C) The instructions for Boiler water, feed water and condensate water monitoring and treatment. (for approval)
  (D) Maintenance jobs to be applied to planned maintenance system. (for approval)
  (E) Plan for monitoring of boiler water and conservation during boiler idling or stand by. (for reference)

### 2. Ships can be assigned the BCM notation are to be satisfied the following requirements.

(1) Boiler conditions during construction survey
  (A) The boiler is to have a sound structural integrity.
  (B) The boiler is to have no plugged tubes, deformations or other sign of damages.
  (C) The boiler is to be free of soot in furnace, and scales, sludge in water side.
  (D) PMS record shows no failure or no lack of maintenance.

(2) System requirement
  (A) Means for adding/dosing chemicals at appropriate places in the system, and at suitable intervals is to be provided.
  (B) Means for taking representative samples from appropriate sampling points, at suitable temperature (e.g. sample cooler installed) is to be provided.

(C) Means for detecting salt in the condensate water is to be provided and connected to the alarm system.
(D) Means for detecting oil in the condensate water is to be provided and connected to the alarm system.

(3) Maintenance requirement
(A) Boiler feed water and condensate water monitoring and chemical treatment are implemented and conducted according to maker's recommendation at least every 24 hours. Quality of boiler water is to also be maintained and documented in accordance with maker's recommendation.
(B) Recording from boiler and feed water monitoring is kept updated onboard and sent to vendor providing analysis of feed water and condensate water at regular intervals not exceeding 12 months. Results and recommendations from the analysis are to be followed up and kept onboard, ready and available for review by the Surveyor.
(C) Internal inspection of the water side of the boiler is to be conducted by the chief engineer at regular intervals not exceeding 12 months. Specific job in the PMS is to be implemented. Mirrors, CCTVs, endoscopes, and cameras may be used for internal inspection. When direct visual internal inspection is not feasible due to the limited size of the internal spaces, such as for small boilers and/or narrow internal spaces, this may be replaced by a hydrostatic pressure test.
(D) Furnace/fire side is to be inspected by the chief engineer every 6 months as a minimum. Specific job in the PMS is to be implemented.
(E) Maintenance of the boiler, burner and control systems as recommended by the makers is implemented in PMS.
(F) In case of installations of two or more boilers, where boilers are not in use for a prolonged period, procedures for boiler water monitoring are to be established and followed up accordingly for the boilers.
(G) Provisions to monitor exhaust gas differential pressure on exhaust gas boilers are to be provided. U-tube manometer may be used for monitoring exhaust gas differential pressure.

(4) Classification Survey
(A) Surveys are to be carried out as the followings;
(a) Complete boiler survey according to **Ch 2, Sec 8.** of the Rules,
(b) Confirming that the boiler is free of plugged tubes, deformations or other sign of damages,
(c) Confirming that the boiler is free of soot, scale and sludge,
(d) Confirming that feed water and condensate water monitoring and treatment has been implemented, and
(e) Confirming applicable maintenance jobs in PMS.

(B) Where applicable, equivalent methods, as the followings, may considered for verifying a condition of the boiler as required by (A).
(a) Prior to assignment of the BCM notation, the followings are to be confirmed to verify a satisfactory condition of the boiler detailed in (1):
(i) Boiler survey to the satisfaction of the Society in conjunction with review of photographic/video evidence of condition of steam and water side of the boiler,
(ii) Review of documented history of internal inspections, repair and maintenance, and
(iii) Review of boiler water management records and comments from service providers.
(b) Historic evidence of satisfactory boiler water treatment capable of providing a protective layer is submitted.
(c) Statement from the ship's chief engineer confirms that the boiler is free of defects.

(C) BCM Record File
The file is to be kept on board, updated with the records of inspection pictures, findings and repairs.

### 3. Periodical survey

(1) The ships assigned with BCM notation may be allowed for the chief engineer to carry out and document the inspection of the water/steam side of the boiler at alternate surveys. The documentation is to be presented to the Surveyor.

(2) Annual survey
(A) Review of planed jobs conducted in PMS
(B) Review of the BCM record file.
(C) Verification of satisfactory function of alarm devices for detecting seawater and oil contamination.

(3) Alternative Boiler survey in accordance with BCM notation
(A) The internal survey on the water-steam side may be carried out by the chief engineer with the following conditions;
(a) annual surveys required in (2) have been carried out satisfactory.
(b) The chief engineer's internal inspection of the water-steam side has been carried out prior to the attendance of the surveyor. The inspection of the boiler is to be recorded in the log book.
(c) Proper documentation is presented to the Surveyor, regarding the satisfactory condition of the water-steam side. Good quality photographs or video marked with date and time may be considered as part of the documentation.
(d) A statement signed by the chief engineer that the internal water-steam side has been satisfactory examined, and that damages, scales or sludge have not been observed.
(e) Chief engineer's qualifications are satisfactorily verified by the Surveyor.

(B) The survey required in **Ch 2, Sec 8** of the Rules are to be carried out in the presence of the Surveyor other than the water-steam side inspection.

(3) Boiler survey other than alternative boiler survey
(A) Survey in accordance with **Ch 2, Sec 8** of the Rules are to be carried out.

## Section 9 Continuous Survey of Machinery

### 902. Survey items *(2021)* 【See Rule】

**1.** In application to **902. 3** of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance.

**2.** In application to **902. 4** of the Rules, in case of passenger ships, the CMS should be complied with the followings.
(1) In applying **Table 2** in **Annex 1-7**, inspections by chief engineers are not allowed for main and auxiliary engines, and inspections are to be conducted in the presence of the Surveyor. *(2020)*
(2) Nevertheless the main and auxiliary engines for passenger ships may be overhauled(or opened up) in accordance with the following tables. However, opened up survey for high-rotating-speed internal combustion engines may be carried out in accordance with the requirements specified in **303. 2** (2) and **502. 1** (1) (b) of the Rules.

**Open-up time of main and auxiliary engine**

| Nos. of Main/Aux. engines | Open-up time |
|---|---|
| 1 set | at the period of the Special Survey |
| 2 sets | 1 set : at the period of the Special Survey<br>1 set : at the period of the third Intermediate Survey |
| 3 sets | 1 set : at the period of the Special Survey<br>1 set : at the period of the second Intermediate Survey<br>1 set : at the period of the third Intermediate Survey |
| 4 sets | 1 set : at the period of the Special Survey<br>1 set : at the period of the first Intermediate Survey<br>1 set : at the period of the third Intermediate Survey<br>1 set : at the period of the fourth Intermediate Survey |

**Example for open-up survey of main & auxiliary engines(periodical survey)**

| Nos. of Main/Aux. engines | | S | $I_1$ | $I_2$ | $I_3$ | $I_4$ | S |
|---|---|---|---|---|---|---|---|
| E×1 | | ○ | △ | △ | △ | △ | ○ |
| E×2 | $E_1$<br>$E_2$ | △<br>○ | △<br>△ | △<br>△ | ○<br>△ | △<br>△ | △<br>○ |
| E×3 | $E_1$<br>$E_2$<br>$E_3$ | △<br>○<br>△ | △<br>△<br>△ | △<br>△<br>○ | ○<br>△<br>△ | △<br>△<br>△ | △<br>○<br>△ |
| E×4 | $E_1$<br>$E_2$<br>$E_3$<br>$E_4$ | △<br>△<br>△<br>○ | ○<br>△<br>△<br>△ | △<br>△<br>△<br>△ | △<br>○<br>△<br>△ | △<br>△<br>○<br>△ | △<br>△<br>△<br>○ |

(NOTES)
○ : full open-up(See **Ch 2, 502.** of the Rules)
△ : internal examinations of the cylinder and combustion side of the cylinder cover, crankshaft bearing parts and measurement for the deflection of the crank web(See **Ch 2, 303.** of the Rules).
$I_1$, $I_2$, $I_3$, $I_4$ : first, second, third, fourth Intermediate Survey between Special Surveys

**3.** In application to **902. 5** of the Rules, "the Guidance" means that it should be complied with the following requirements.

(1) The CMS may be commenced since the Classification Survey during Construction.
(2) Upon the request of owner, where deemed appropriate by the Society, the CMS may be commenced since the Classification Survey after Construction and in case of TOC(transfer of classification) the CMS may be continued to commence the CMS status executed by another society.
(3) On ships registered in the Society, where the shipowner is newly to apply for the CMS, after the Special Survey all CMS may be carried out subject to planning a regular CMS cycle at once until the date of the next Special Survey.

**4.** In application to **902. 6** of the Rules, the withdrawal of CMS should be satisfied with the followings:
(1) Where withdrawal of the CMS by the shipowner's request or the CMS system not carried out in accordance with the requirements is found, the CMS may be cancelled by the Society.
(2) After cancellation of CMS, if there are any CMS items of which due date would exceed 5 years at the date of the next Special Survey, the items are recommended to be inspected within 5 years from the last survey.
(3) All items scheduled for survey at Special Survey are to be carried out from the next Special Survey.

## 903. Planned Maintenance System

**1.** The term "deemed necessary by the Surveyor" means the cases as specified in **Ch 1, 801. 6** of the Guidance. *(2021)* **【See Rule】**

**2.** In application to **903. 2** of the Rules, the Implementation Survey and Annual Audit mean as follows; **【See Rule】**

(1) Implementation Survey;

(A) The Implementation Survey shall be carried out by the Society within one year from the date of approval of PMS. *(2019)*

(B) During the Implementation Survey the following shall be verified by the Surveyor to ensure;
(a) the PMS is implemented according to the approved documents, and is adapted to the type and complexity of the components/system on board;
(b) the PMS is producing the documentation required for the Annual Audit and the requirements of surveys and testing for retention of class are complied with;

(c) the onboard personnel is familiar with the PMS.
(d) First-grade licence issued in the relevant nation for Chief Engineer is to be provided.

(C) where this survey is carried out and the implementation is found in order, a report describing the PMS shall be submitted to the Society and the approved PMS may replace the CMS. *(2019)*

(D) An Implementation Survey shall be carried out to confirm the validity of "Certificate of Approval for Planned Maintenance Scheme".

(2) Annual Audit;

(A) An Annual Audit of the PMS shall be carried out by a Society's Surveyor and preferably concurrently with the annual survey of machinery.

(B) The Surveyor shall review the annual report or verify that it has been reviewed by the Society.

(C) The purpose of this survey shall be to verify that the scheme is being correctly operated and that the machinery has been functioning satisfactorily since the previous survey. A general examination of the items concerned shall be carried out.

(D) The performance and maintenance records shall be examined to verify that the machinery has functioned satisfactorily since the previous survey or action has been taken in response to machinery operating parameters exceeding acceptable tolerance and the overhaul intervals have been maintained.

(E) Written details of break-down or malfunction shall be made available.
(F) First-grade licence issued in the relevant nation for Chief Engineer is to be provided.

(G) Description of repairs carried out shall be examined. Any machinery part, which has been replaced by a spare one, due to damage, is to be retained on board, where possible, until examined by the Society's Surveyor.

(H) Upon satisfactory completion of the above requirements, the Society shall retain the PMS

**3.** In application to **903. 4** of the Rules, the damage and repairs for PMS should be complied with the following requirements. **【See Rule】**

(1) The damage of components/machinery, it shall be reported to the Society. The repairs of such damaged components/machinery shall be carried out to the satisfaction of the Surveyor.

(2) Any repairs and corrective action regarding machinery under PMS shall be recorded in the PMS logbook and to be verified by the Society's Surveyor at the Annual Audit.

(3) In the case of overdue outstanding Conditions of Class or a record of unrepaired damage which would affect the PMS, the relevant items shall be kept out the PMS until the Conditions of Class is fulfilled or the repair is carried out. *(2020)*

**4.** In application to **903. 5** of the Rules, the withdrawal of PMS should be satisfied with the following requirements. **【See Rule】**

(1) The survey arrangement for machinery under PMS can be cancelled by the Society if PMS is not being satisfactorily carried out either from the maintenance records or the general condition of the machinery, or when the agreed intervals between overhauls are exceeded.

(2) The shipowner may, at any time, cancel the survey arrangement for machinery under PMS by informing the Society in writing and for this case the items which have been inspected under the PMS since the last Annual Survey can be accepted by the Society.

# Section 10 Occasional Survey

## 1001. Occasional Survey *(2022)* 【See Rule】

### 1. Alteration for tank use of cargo hold as deep tank(water or oil)

When tank use is to be altered from cargo hold as deep tank to cargo hold, application of the alteration, in written form, is to be submitted by the Owners to the Society. Suction mouths in cargo holds as deep tanks are to be removed, and the end parts of the pipings are to be closed by blind flanges. Upon completion of alteration works and thereafter, tank testings for the altered cargo holds are dispensed with.

### 2. Alteration for tank use of each tank

When an alteration of tank use is desired, the Owners should notify the Society that the alteration will be made. The Society will review the recalculation of longitudinal strength and whether or not reinforcements will be necessary. However, this requirement does not apply to a ship treated according to **Pt 3, Ch 3, 101.** of the Rules.

### 3. Alteration for loading condition

When it is planned that a specialized ship is about to be loaded in an outstandingly different manner(other than that reviewed by the Society at the time of plan approval), the plans showing the calculation of longitudinal strength, shear strength and local strength should be approved by the Society.

# Section 19 Special Requirements for Ships Subject to Korean Ship Safety Act or Fishing Vessels Act

## 1901. Special requirements for ships subject to Korean Ship Safety Act *(2022)* 【See Rule】

**1.** In application to **301.**(Due range of Intermediate Survey) **3** and **401.**(Due range of Special Survey) **4** and **5** of the Rules, ships specified in **1901. 3** of the Rules are not to be applied.

**2.** The Docking Survey for ships operating in the inland waters only is able to be substituted by In-water Survey except when the Docking Survey is to be carried out in conjunction with the Special Survey, but not 3 times continuously in case of passenger ships.

**3.** In application to **1901. 2** of the Rules, the measurement record is to give names and signatures of operators including name and stamp of the company, measurement equipment, listing of electrical installations being measured, readings, checking of the effectiveness of measurement equipment (calibration records, etc.) and signature of the chief engineer, etc. *(2017)*

**4.** In application to **1901. 3** of the Rules, the surveys required in **603.** of the Rules are to be carried out in drydock or on a slipway at the Intermediate Survey. However the clearance measurements for sea water lubricated stern tube bearing and rudder bearing may be omitted but not 3 times continuously.

**5.** In application to **902. 3** (1), in principle, the CMS system cannot be applied to passenger ships subject to Korean Ship Safety Act. However, CMS for auxiliaries other than main and auxiliary engines can be applied. *(2019)* ⚓

# CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME

## Section 2 Bulk Carriers

### 202. Annual Survey *(2021)*

**1.** In application to **202. 6** (2) of the Rules, "the Guidance" means the requirements specified as follows. **【See Rule】**

(1) General

(A) In the case of bulk carrier over 5 year of age, the Annual Survey is to include, in addition to the requirements of the Annual Surveys specified in **202.** of the Rules, an examination of the following items:

(B) Extent of Survey

(a) For bulk carriers of 5 – 15 years of age:

(i) An Overall Survey of the foremost cargo hold, including Close-up Survey of sufficient extent, minimum 25% of frames, is to be carried out to establish the condition of:

- Shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads.
- Suspect areas identified at previous surveys.

(ii) Where considered necessary by the Surveyor as a result of the Overall and Close-up Survey as described in (i) above, the survey is to be extended to include a Close-up Survey of all of the shell frames and adjacent shell plating of the cargo hold.

(b) For bulk carriers exceeding 15 years of age:

(i) An Overall Survey of the foremost cargo hold, including Close-up Survey is to be carried out to establish the condition of:

- All shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads.
- Suspect areas identified at previous surveys.

(C) Extent of thickness measurement *(2018)*

(a) Thickness measurement is to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to Close-up Survey, as described in (B) (a) (i) and (b) (i) above and in case of areas found to be suspect at previous surveys, the thickness measurement for suspect areas are to be carried out additionally. Where substantial corrosion is found, the extent of thickness measurements should be increased with the requirements of **Annex 1-5, Table 14** of the Guidance.

(D) Special consideration

(a) Where the hard protective coating in the foremost cargo hold is found to be in GOOD condition, the extent of Close-up Surveys and thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

Note : For existing bulk carriers, where Owners may elect to coat or recoat cargo holds as noted above, consideration may be given to the extent of the Close-up Surveys and thickness measurement. Prior to the coating of cargo holds of existing ships, scantlings should be ascertained in the presence of a Surveyor.

# Section 3 Oil Tankers

## 304. Special Survey *(2021)*

**1.** In application to **304. 5** of the Rules, the following guidance on pressure testing of boundaries of cargo tanks under direction of the master is to be applied. **【See Rule】**

(1) Where the ship is in a shipyard or is under attendance of the Surveyor(s) the testing of cargo tanks is to be carried out under the direction, and in the presence, of the Surveyor(s). It should be noted that all ballast tanks adjacent to cargo tanks are to be tested by the Surveyor(s).

(2) Tests of the cargo tank(s) carried out under this procedure are to be the satisfaction of the master.

(3) "Failed test" : where the outcome of tank testing reveals structural damage or leakage, the Society should be advised with immediate effect, and attendance on board by the Surveyor arranged.

(4) Pressure testing using cargo

(A) In order to test the relevant boundaries, the ship may be loaded in a checker board pattern(**Fig 1.3.1**), so that each cargo tank internal bulkhead is subjected to a fully loaded head of pressure provided that the intended loading and stability condition are checked and confirmed by the master.

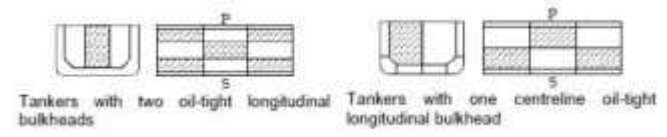



**Fig 1.3.1 "Stagger test" – checker board pattern**

(B) The ship's logbook is to confirm that (A) above and (5) below, have been successfully carried out and that it is to be signed by the master.

(5) Combined pressure and tightness testing using ballast water

If practical with respect to the operation of the ship, it is acceptable to carry out combined pressure and tightness testing using ballast water provided the relevant requirements in (4) above are complied with and that the relevant tank boundaries are accessible for inspection. The boundaries and associated welds between the tank under test and adjacent cargo tanks are to be fully inspected to ensure there is no indication of water leakage across the boundaries.

(6) Water ballast tanks inclusive boundaries facing the cargo tanks, shall be tested in accordance the relevant Rules. These tests are to be witnessed and all boundaries are to be examined by the attending Surveyor.

(7) Master's inspections, assessment and reporting

(A) General

The following requirements describe the operations that are required of the master when carrying out the inspections of the boundaries of the cargo tank which are to be submitted to a hydrostatic test. All safety precautions and facilities (lighting, ventilation, etc.) should be provided according to the ship's safety management system(SMS) documentation and the cargo tank testing procedure as approved by the Society.

(B) Places to be inspected

(a) All boundaries of the cargo tank under testing are to be examined from positions outside of the cargo tank boundaries. Boundaries of commonly shaped tanks are constituted by:

(i) a transverse aft bulkhead and associated structure;
(ii) a transverse fore bulkhead and associated structure;

(iii) two longitudinal bulkheads and relevant associated structure; and
(iv) an inner bottom plating and associated structure.

(b) Each of these boundaries is the common division between the cargo tank under testing and another:
(i) cargo tank, or
(ii) ballast tank/double bottom, or
(iii) fuel oil tank, or
(iv) void space, or pump-room.

(c) The inspection is to verify that:
(i) the plating and structures of each boundary are not affected by evident geometrical defects, such as deflection/distortion of the structures supporting the plating of the boundaries, when hydro-statically loaded; and

(ii) the tightness of each boundary is not impaired, i.e. no leakages are to appear anywhere on surface of each boundary, especially at the welded joints connecting the plates which constitute the boundary itself.

(d) Each boundary should be closely inspected, noting any defective items from the two categories above.

(C) Reporting
(a) Following the inspection of all boundaries surrounding the cargo tank under test, the master is required to report, in a simple manner, the results of the inspection. The report is to be recorded in the ship's logbook and include all data relevant to:

(i) identification of the cargo tank subjected to testing;
(ii) identification of the compartments surrounding the cargo tank subject to testing;
(iii) date, time and place of testing;
(iv) ship's loading condition during the testing, including ship trim; and
(v) outcome of the inspections carried out during the testing.

The report is to be retained on board for the attention of the Surveyor(s).

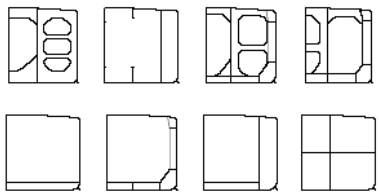
(b) Where no deficiencies have been found or noted, the testing of the cargo tank can be considered as having a satisfactory outcome. ⚓

# 〈ANNEX〉

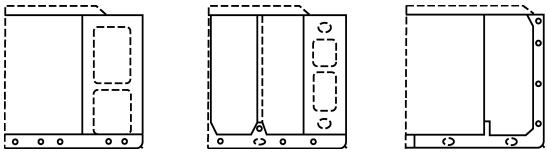
## Annex 1-1 Class Notations

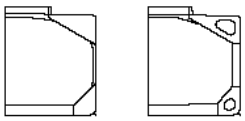
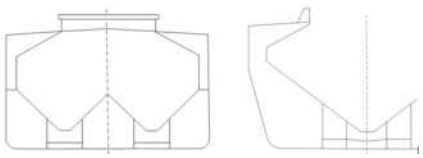
## 1. Class Notations

### 1.1 Ship Type and Special Feature Notations

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 1. Oil Tanker<br>'ESP'[(2-1)]<br>(Double Hull)[(2-2)]<br>(Double Hull)(EXP)[(2-3)]<br>(FAC)[(1)]<br>(FAO)[(1)]<br>(FBC)[(1)]<br>(CSR)[(2-4)] | Crude<br>Product<br>Crude/Product<br>Product/Asphalt<br>Asphalt | [(1)] : The notations FA, FB, FAC, FAO and FBC in rows 1, 3, 4, 8, 9 and 18 of the first column imply:<br>FA : Flash point above 60°C<br>FB : Flash point of 60°C and below<br>FAC : FA with controlled tank vents<br>FAO : FA with open tank vents<br>FBC : FB with controlled tank vents<br><br>[(2-1)] : The notation "ESP" shall be assigned to ships which are constructed with integral cargo tanks and intended primarily to carry oil in bulk. This type notation shall be assigned to tankers of both single and double hull construction, as well as tankers with alternative structural arrangements, e.g. mid-deck designs. (Typical midship sections are given in **Fig 1**) *(2024)*<br><br>Note: 1) Oil Tankers that do not comply with MARPOL I/19 may be subject to international and/or national regulations requiring phase out under MARPOL I/20 and/or MARPOL I/21.<br><br>2) Oil Tankers carrying oil in independent tanks not part of ship's hull such as aspalt carriers do not fall withing the scope of the Enhanced Survey Programme(ESP). *(2021)*<br><br>  <br>**Fig 1 Typical midship sections of Oil Tanker 'ESP'**<br><br>[(2-2)] : The notation "(Double Hull)" shall be assigned to ships which are constructed primarily for the carriage of oil in bulk, which have the cargo tanks protected by a double hull complied with the Reg. 19.3 of Annex I of MARPOL 73/78 which extends for the entire length of the cargo area, consisting of double sides and double bottom spaces for the carriage of water ballast or void spaces.<br><br>[(2-3)] : Any ships not applicable to [(2-2)], the notation "(Double Hull)(EXP)" shall be assigned to ships which are constructed primarily for the carriage of oil in bulk, which have the cargo tanks protected by a double hull complied with the Reg. 19.6 of Annex I of MARPOL 73/78 which extends for the entire length of the cargo area, consisting of double sides and double bottom spaces for the carriage of water ballast or void spaces. *(2021)*<br><br>[(2-4)] : This notation shall be assigned to ships comply with the requirements specified in **Pt 12** or **Pt 13** of the Rules. *(2019)* |

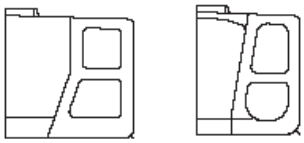
<table>
<tr><th>Ship Types</th><th colspan="6">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td rowspan="3">2-1. Liquefied Gas Carrier (2022)</td><td>A</td><td>B</td><td>(C)</td><td>D and/or P</td><td>IMO Code(5)</td><td rowspan="3">(4) : The notation "LPG" shall be assigned to liquefied gas carriers carrying only propane and butane. However, the names of the following cargoes, instead of propane and butane, may be given for vessels carrying cargoes other than propane and butane under the approval of the Society.<br>(Example) : Ammonia, Butadiene, Propylene, VCM, Ethylene Oxide, Ethylene, LCO2 etc.<br><br>(5) : As shown in the following:<br>1) The notation “NIGC” shall be appended to vessels in compliance with the requirements given in Pt 7, Ch 5 of the Rules amended after 1 July, 2016. (2021)<br><br>2) The notation "IGC" shall be appended to vessels built in compliance with the requirements given in Pt 7, Ch 5 of the Rules and constructed on or after 1 July, 1986.<br><br>3) The notation "GC" shall be appended to vessels built in compliance with the IMO Res.A328(IX).<br><br>4) The notation "GCX" shall be appended to vessels built in compliance with the IMO Res.A329(IX).<br><br>5) For the ships except the above, additional notation is not assigned.</td></tr>
<tr><td>1G<br>2G<br>2P<br>G<br>3G</td><td>2I<br>3M<br>3S<br>1A<br>1B<br>1C<br>NV</td><td>(R)<br>(P)<br>(RP)</td><td>Maximum Vapour Pressure, Minimum Temperatur eand Specific Gravity(SG)<br>Name of Liquefied Gas primar-ily carried (2024)</td><td>(NIGC)<br>(IGC)<br>(GC)<br>(GCX)</td></tr>
<tr><td colspan="5">LPG(4)</td></tr>
<tr><td>2-2. Compressed Natural Gas Carrier</td><td colspan="2">A</td><td colspan="3">B</td><td>(3-3) : This notation shall be assigned to ships having coiled cargo tanks which are complied with Ch 3, 402. 1 (2) (A) of the Guidance for Ships Carrying CNG in Bulk.<br><br>(3-4) : This notation shall be assigned to ships having cylinderical cargo tanks which are complied with Ch 3, 402. 1 (2) (B) of the Guidance for Ships Carrying CNG in Bulk.</td></tr>
<tr><td></td><td colspan="2">CO(3-3)<br>CY(3-4)</td><td colspan="3">Design Pressure, Minimum Temperature</td><td></td></tr>
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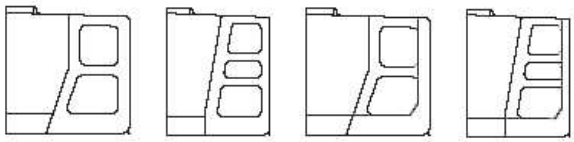
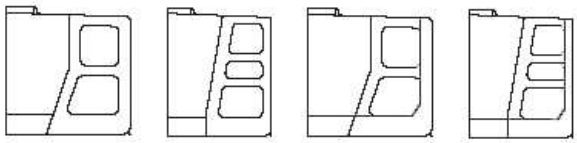
<table>
<tr><th colspan="2" rowspan="2">Ship Types</th><th colspan="4">Special Feature Notations</th><th rowspan="2">Remarks</th></tr>
<tr><th>A</th><th>B</th><th>D and/or P</th><th>IMO Code[8]</th></tr>
<tr><td rowspan="3"></td><td rowspan="3">'ESP'[7-1]</td><td rowspan="3">I<br>II<br>III<br>II&III[9]</td><td rowspan="3">1G<br>2G<br>1P</td><td>Apparent Specific Gravity (SG)</td><td rowspan="3">(IBC)<br>(BCH)<br>(BCX)</td><td rowspan="3">[7-1] : The notation "ESP" shall be assigned to ships which are constructed generally with integral tanks and intended primarily to carry chemicals(liquid cargoes specified in Pt 7, Ch 6, Sec 17 of the Rules) in bulk. This type notation shall be assigned to tankers of both single or double hull construction, as well as tankers with alternative structural arrangements. (Typical midship sections are given in Fig 2)<br>  <br>Fig 2 Typical midship sections of Chemical Tanker 'ESP'</td></tr>
<tr><td>Name of Chemical primarily carried (2024)</td></tr>
<tr><td colspan="2">3-1. Chemical Tanker<br>(FAC)[1]<br>(FAO)[1]<br>(FBC)[1]</td><td colspan="4"></td><td>[7-2] : This notation shall be appended to vessels carrying only cargoes in bulk, except liquid cargoes specified in Pt 7, Ch 6, Sec 17 of the Rules, classified as pollution category Z, or category Z and OS, which are not subject to IBC code, specified in Pt 7, Ch 6, Sec 18 of the Rules.</td></tr>
<tr><td colspan="2">3-2. NLS Tanker</td><td colspan="4">Category Z(18)[7-2]</td><td>[8] : As shown in the following:<br>1) The notation "IBC" shall be appended to vessels built in compliance with the requirements given in Pt 7, Ch 6 of the Rules and constructed on or after 1 July, 1986.<br>2) The notation "BCH" shall be appended to vessels built in compliance with the requirements given in Pt 7, Ch 6 of the Rules and constructed before 30 June, 1986 and on or after 12 April, 1972.<br>3) The notation "BCX" shall be appended to vessels built in compliance with Para. 1.7.3 of BCH code and constructed before 11 April, 1972<br>[9] : At the request of the Owner, it may be added if the requirements for Type II and Type III are simultaneously satisfied, for example, in the following cases. (2022)<br>1) Ships with a mixture of Type II and Type III cargo tank layouts<br>2) Among Type II vessels, each tank volume exceeds 3000m$^3$</td></tr>
<tr><td colspan="2">4. Oil/Chemical Tanker<br>(Double Hull)[2-2]<br>(Double Hull) (EXP)[2-3]<br>'ESP'[2-1][7-1]<br>(FAC)[1]<br>(FAO)[1]<br>(FBC)[1]<br>(CSR)[2-4]</td><td colspan="4">Special Feature Notations given in row 1 and row 3</td><td></td></tr>
</table>

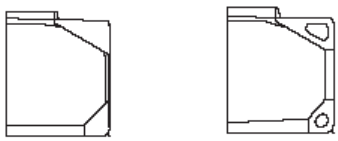
<table>
<tr><th rowspan="2">Ship Types</th><th colspan="2">Special Feature Notations</th><th rowspan="2">Remarks</th></tr>
<tr><th colspan="2">A</th></tr>
<tr><td>5-1. (2017)<br>Bulk Carrier<br>(Double Skin)(11-1)<br>'ESP'(11-2)<br>'ESP'(EXP)(11-2)<br>(CSR)(11-4)<br><br>5-2. (2017)<br>Bulk Carrier(14)<br>(Double Skin)(11-1)<br>(CSR)(11-4)<br><br>5-3. (2017)<br>Self-Unloading<br>Bulk Carrier<br>'ESP'(11-3)<br>(Double Skin)(11-1)</td><td>-<br>HC(12-1)<br>HC/E(13)<br>BC-A*1<br>BC-B*2<br>BC-C*3</td><td>GRAB[X]*4<br>max cargo density (t/m3)*5<br>no MP*6<br>Holds Nos. ... may be empty*7<br>Block loading*8</td><td>(11-1) : This notation shall be assigned in the following cases. (Note: The relevant requirements specified in Pt 1, Ch 3, Sec 6 Double Skin Bulk Carriers are to be applied if applicable even if the ship has no Double Skin notation)<br>(1) the ships, constructed before 1 July 1999, have double side skin construction<br>(2) the ships, constructed before 1 January 2000, have double side skin construction of not less than 760 mm breadth at any location within the hold length, measured perpendicular to the side shell<br>(3) the ships, constructed on or after 1 January 2000, have double side skin construction of not less than 1000 mm breadth at any location within the hold length, measured perpendicular to the side shell<br><br>(11-2) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended primarily to carry dry cargoes in bulk. However, for ships where only some of the holds meet the structural configuration stated above, ESP(EXP) shall be assigned and then Holds Nos. ... shall be assigned as a special feature notations for those holds. (2025)<br>(Typical midship sections are given in Fig 3-1)<br><br>Note: Cargo holds corresponding to ESP(EXP) are included in the scope of application of the Enhanced Survey Programme(ESP), but cargo holds not corresponding to ESP(EXP) are not included in the scope of application of the Enhanced Survey Prpgramme(ESP). (2025)<br><br>  <br>Fig 3-1 Typical midship sections of Bulk Carrier 'ESP'<br><br>(11-3) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended to carry and self-unload dry cargoes in bulk. (Typical midship sections are given in Fig 3-2)<br><br>  <br>Fig 3-2 Typical midship sections of Self-Unloading Bulk Carrier 'ESP'<br><br>(11-4) : This notation shall be assigned to ships comply with the requirements specified in Pt 11 or Pt 13 of the Rules.<br><br>(12-1) : The additional notation, HC, is normally assigned to a ship with the double bottom structure specially strengthened for the carriage of cargoes having cargo density of 1.0 ($t/m^3$) and above. (2022)</td></tr>
</table>

<table>
<tr><th rowspan="2">Ship Types</th><th colspan="2">Special Feature Notations</th><th rowspan="2">Remarks (continued)</th></tr>
<tr><th colspan="2">A</th></tr>
<tr><td></td><td>-<br>HC(12-1)<br>HC/E(13)<br>BC-A*1<br>BC-B*2<br>BC-C*3</td><td>GRAB[X]*4<br>max cargo density (t/m3)*5<br>no MP*6<br>Holds Nos. ... may be empty*7<br>Block loading*8</td><td>(13) : The additional notation, HC/E, is normally assigned to a ship intended for the alternate loading, in addition to the requirements specified in (12-1) above. (2022)<br><br>(14) : Where other structural configurations than stated in (11-2) above comply with the applicable requirements specified in Pt 7, Ch 3 of the Rules, the notation "Bulk Carrier" shall be assigned. In such cases, the additional requirements for Bulk Carrier 'ESP' and Bulk Carrier(Double Skin) 'ESP' specified in Pt 1 of the Rules shall not be applied. (2025)<br><br>*1 : Bulk carriers designed to carry dry bulk cargoes of cargo density of 1.0 $t/m^3$ and above with specified holds empty at maximum draught in addition to BC-B conditions as Pt 7, Ch 3, Sec 2 or Pt 11, Ch 1, Sec 1 or Pt 13, Sub-part 1, Ch 1, Sec 1 of the Rules.<br><br>*2 : Bulk carriers designed to carry dry bulk cargoes of cargo density of 1.0 $t/m^3$ and above with all cargo holds loaded in addition to BC-C conditions as Pt 7, Ch 3, Sec 2 or Pt 11, Ch 1, Sec 1 or Pt 13, Sub-part 1, Ch 1, Sec 1 of the Rules.<br><br>*3 : Bulk carriers designed to carry dry bulk cargoes of cargo density of less than 1.0 $t/m^3$ as Pt 7, Ch 3, Sec 2 or Pt 11, Ch 1, Sec 1 or Pt 13, Sub-part 1, Ch 1, Sec 1 of the Rules.<br><br>*4 : The additional notation GRAB[X] is assigned to ships with holds designed for loading/unloading by grabs having a maximum specific weight up to [X] tons in compliance with the requirements of Pt 11, Ch 12, Sec 1 or Pt 13, Sub-part 2, Ch 1, Sec 6 of the Rules, the GRAB[X] notation is mandatory for ships having one of BC-A or BC-B, according to Pt 11, Ch 1, Sec 1 or Pt 13, Sub-part 1, Ch 1, Sec 1 of the Rules and these ships are to be complied with for an unladen grab weight X equal to or greater than 20 tons. For all other ships GRAB[X] is voluntary.<br><br>*5 : For additional service features BC-A and BC-B if the maximum cargo density is less than 3.0 t/m3 as Pt 7, Ch 3, Sec 2 or Pt 11, Ch 4, Sec 7 or Pt 13, Sub-part 1, Ch 4, Sec 8 of the Rules.<br><br>*6 : For all additional service features when the ship has not been designed for loading and unloading in multiple ports as Pt 7, Ch 3, Sec 2 or Pt 11 Ch 4 Sec 7 or Pt 13 Sub-part 1 Ch 4 Sec 8 of the Rules.<br><br>*7 : For additional service feature BC-A as Pt 7, Ch 3, Sec 2 or Pt 11, Ch 4, Sec 7 or Pt 13, Sub-part 1, Ch 4, Sec 8 of the Rules.<br><br>*8 : For additional service feature BC-A, when the ship is intended to operate in alternate block load condition as Pt 13, Sub-part 1, Ch 4, Sec 8 of the Rules.</td></tr>
</table>

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 6. Cargo Ship *(2017)* | -<br>HC[12-2]<br>General Dry Cargo[15-1]<br>Wood Chip Carrier[15-2]<br>Cement Carrier[15-3]<br>Livestock Carrier[15-4]<br>Deck Cargo Ship[15-5]<br>General Dry Cargo(Double Skin)[15-6]<br>Liquid Cargo(Category OS only)[15-7]<br>Container[15-8] *(2019)* | [12-2] : The additional notation, **HC,** is normally assigned to a ship with the double bottom structure specially strengthened for the carriage of heavy cargoes having mass density, $\gamma$, specified in **Pt 3, Ch 7, 101. 7** of the Rules, not less than 1.25($t/m^3$). *(2022)*<br>[15-1] : This notation shall be assigned to all self-propelled general dry cargo ships of 500 GT and above carrying solid cargoes and the additional requirements for General Dry Cargo Ship specified in **Pt 1, Ch 2, Sec 15** of the Rules are to be applied. However the following ships are to be omitted.<br>- bulk carriers and double skin bulk carriers subject to the enhanced survey programme(ESP)<br>- dedicated container carriers<br>- ro-ro cargo ships<br>- refrigerated cargo ships<br>- dedicated wood chip carriers (A ship that is specially designed to carry wood chip)[15-2]<br>- dedicated cement carriers (A ship that is specially designed to carry cement)[15-3]<br>- livestock carriers (A ship that is specially designed to carry livestock)[15-4]<br>- deck cargo ships (A ship that is designed to carry cargo exclusively above deck without any access for cargo below deck)[15-5]<br>- general dry cargo ships of double side-skin construction, with double side-skin extending for the entire length of the cargo area, and for the entire height of the cargo hold to the upper deck[15-6]<br>[15-7] : This notation shall be assigned to ships carrying only liquid cargoes in bulk classified as pollution category OS, which are not subject to IBC code, specified in **Pt 7, Ch 6, Sec 18** of the Rules.<br>[15-8] : Even though cell guides are not installed on ships, but shall be assigned to the ships carrying containers generally by means of approved container securing fittings and stowage method in accordance with **Annex 7-2, Pt 7** of the Guidance. (e.g. Multi-Purpose Ship) *(2019)* |

<table>
<tr><th>Ship Types</th><th colspan="2">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td rowspan="2">7. Ore Carrier<br>'ESP'(16)<br>(2018)</td><td colspan="2">A</td><td rowspan="2">(16) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, two longitudinal bulkheads and a double bottom throughout the cargo length area and intended primarily to carry ore cargoes in the centre holds only. (Typical midship sections are given in Fig 4)<br>  <br>Fig 4 Typical midship sections of Ore Carrier 'ESP'<br>*1) : This notation shall be assigned to ships has not been designed for loading and unloading in multiple ports as Pt 7 Annex 7-10 of the Guidance.<br>*2) : This notation shall be assigned to ships with holds designed for loading/unloading by grabs having a maximum specific weight up to [X] tons in compliance with the requirements of Pt 7, Ch 2, 101. 2 of the Guidance.<br>*3),*4) : to ships designed (specially constructed or equipped) to carry solid bulk cargoes (cargoes in Group A of the IMSBC code) that may liquefy during voyage, in accordance with Pt 7, Annex 7-12 of the Guidances (2023)</td></tr>
<tr><td>no MP*1)</td><td>GRAB[X]*2)<br><br>LIQBC-1*3),<br>LIQBC-2*4)<br>(2023)</td></tr>
</table>

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 8-1.<br>Ore/Oil Carrier<br>'ESP'(17-1)<br>(FAC)(1)<br>(FAO)(1)<br>(FBC)(1) | Special Feature Notations given in row 1 and row 7 | (17-1) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, two longitudinal bulkheads and a double bottom throughout the cargo length area and intended primarily to carry ore cargoes in the centre holds or of oil cargoes in centre holds and wing tanks. However, these cargoes are not carried simultaneously. (Typical midship sections are given in **Fig 5-1**)<br><br>Note: Ore/Oil Carriers that do not comply with MARPOL I/19 may be subject to international and/or national regulations requiring phase out.<br><br>  <br>**Fig 5-1 Typical midship sections of Ore/Oil Carrier 'ESP'** |
| 8-2.<br>Ore/Chemical Carrier<br>'ESP'(17-2)<br>(FAC)(1)<br>(FAO)(1)<br>(FBC)(1) | Special Feature Notations given in row 3 and row 7 | (17-2) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, two longitudinal bulkheads and a double bottom throughout the cargo length area and intended primarily to carry ore cargoes in the centre holds or of chemical cargoes in centre holds and wing tanks. However, these cargoes are not carried simultaneously. (Typical midship sections are given in **Fig 5-2**)<br><br>  <br>**Fig 5-2 Typical midship sections of Ore/Chemical Carrier 'ESP'** |
| 8-3.<br>Oil/Liquefied Gas Carrier *(2022)*<br>'ESP'(17-3)<br>(Double Hull)<br>(DoubleHull)(EXP)<br>(FAC)<br>(FAO)<br>(FBC)<br>(CSR) | Special Feature Notations given in row 1 and row 2-1 | (17-3) : In case of a combined vessel(double hull oil tanker / liquefied gas carrier) with an independent tank in hull, the independent tank is surveyed according to the requirements of the liquefied gas carrier, and only for the cargo area with integrated tank is surveyed according to the requirements of double hull oil tanker, |

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 9. Oil/Bulk/Ore Carrier<br>'ESP'(18)<br>'ESP'(EXP)(18)<br>(FAC)(1)<br>(FAO)(1)<br>(FBC)(1) | Special Feature Notations given in row 1, row 5 and row 7 | (18) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in the cargo length area and intended primarily to carry oil or dry cargoes including ore, in bulk. However, these cargoes are not carried simultaneously. For ships where only some of the holds meet the structural configuration stated above, ESP(EXP) shall be assigned and then Holds Nos. ... shall be assigned as a special feature notations for those holds. *(2025)* (Typical midship section is given in **Fig 6**)<br><br>Note: Cargo holds corresponding to ESP(EXP) are included in the scope of application of the Enhanced Survey Programme(ESP), but cargo holds not corresponding to ESP(EXP) are not included in the scope of application of the Enhanced Survey Prpgramme(ESP). *(2025)*<br>  <br>**Fig 6 Typical midship sections of Oil/Bulk/Ore Carrier 'ESP'** |
| 10. RoRo Ship | -<br>Car Carrier(19-1)<br>Car/Cargo(19-2)(19-4)<br>Car/Container(19-2)(19-4)<br>Car/Bulk(19-2)(19-4)<br>Car Ferry(19-3)(19-4)<br>Cassette(19-5) | - : Additional notation is not required for ships not intended to carry vehicles.<br><br>(19-1) : This notation shall be assigned to ships, other than car ferry ships engaged in national voyages and subject to **Pt 7, Annex 7-3** of the Guidance, which are intended primarily to carry vehicles on vehicle decks in roll-on/roll-off system. For pure car carriers or pure car/truck carriers intended primarily to carry vehicles on several vehicle decks in superstructure running the entire length and breadth of the hull, fully enclosed as well as on vehicle decks under the freeboard deck in roll-on/roll-off system, "PCC" notation shall be assigned additionally after "Car Carrier" notation.<br><br>(19-2) : This notation shall be assigned to ships intended to carry not only vehicles in roll-on/roll-off system but also the relevant cargoes in loading/unloading system other than roll-on/roll-off system such as general cargo ships, container ships or bulk carriers. If these ships are car ferry ships engaged in national voyages which are subject to **Pt 7, Annex 7-3** of the Guidance, the notation "Car Ferry/Cargo", "Car Ferry/Container" or "Car Ferry/Bulk" shall be assigned instead of these notations applicable.<br><br>(19-3) : This notation shall be assigned to car ferry ships, other than specified in (19-2), which are engaged in national voyages and subject to **Pt 7, Annex 7-3** of the Guidance.<br><br>(19-4) : The notation "(open space)" shall be assigned additionally to car ferry ships, engaged in national voyages, having Open Vehicle Space only.<br><br>(19-5) : This notation shall be assigned to ships intended to carry cargoes in roll-on/roll-off system using cassettes primarily. |

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 11. Container Ship[20] | LS[20-1]<br>LS(CL)[20-2]<br>LS(CL, RS)[20-3]<br>LS(CL, RS+)[20-4]<br>LS(HHS or HHT)[20-5] *(2023)* | [20] : This notation shall be assigned to ships designed and constructed to carry containers exclusively.<br>[20-1] : This notation shall be assigned to ships where container securing arrangements are fitted, and design and construction of the system are in accordance with **Pt 7, Annex 7-2** of the Guidance.<br>[20-2] : This notation shall be assigned to ships where the program for lashing calculations is approved by the Society and installed and maintained onboard in accordance with **Pt 7, Annex 7-2** of the Guidance in addition to [20-1] above.<br>[20-3] : This notation shall be assigned to ships where the contents related to the application of the specific route reduction factors provided by the Society are included in Cargo Securing Manual and the specific route reduction factors are applicable to onboard lashing program in accordance with **Pt 7, Annex 7-2** of the Guidance in addition to [20-2] above.<br>[20-4] : This notation shall be assigned to ships where the contents related to the application of the user-specified route reduction factors provided by the Society are included in Cargo Securing Manual and ships equipped with a program that can calculate the route reduction factors for an arbitrary route in accordance with Pt 7, Annex 7-2 of the Guidance in addition to [20-2] above. *(2019)*<br>[20-5] : This notation shall be assigned to ships where container securing arrangements are used, and design and construction of the system are in accordance with **Ch 3, Sec 25, 2504** or **2505** of the **Guidance for Approval of Manufacturing Process and Type Approval, Etc** *(2022)* |
| 12. Fishing Vessel | Long Liner, Stern Trawler, Side Trawler, Whaler, Purse Seiner, Gill Net, Angling, Stick-held Dip Net, Bottom Long Liner, Trap, Stow Net, Lift Net, Dredge Net, Seiner, Stab Net, Lighting, Pole and Line *(2021)* | |
| 13. Fish Carrier | Fresh and Live Fish, Fresh Fish Live Fish, Fish Factory | |

<table>
<tr><th>Ship Types</th><th colspan="3">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td rowspan="2">14.<br>Passenger Ship</td><td>A<br>(Type)</td><td>B<br>(Additional purpose)</td><td>C</td><td rowspan="2">- : Additional notation is not required for passenger ship built to carry passenger exclusively.<br><br>(23-1) : Ships with Vehicle Spaces specified in Pt 7, Annex 7-3 of the Guidance, ships with Vehicle Spaces specified in Rules for the Classification of High Speed and Light Crafts or ships with spaces intended for carriage of vehicle except Special Category Spaces or RoRo Spaces specified in SOLAS Ch.II-2.<br><br>(23-2) : Ships with Special Category Spaces specified in SOLAS Ch.II-2 or IMO HSC Code (International Code of Safety for High-speed Craft).<br><br>(23-3) : Ships with RoRo Spaces specified in SOLAS Ch.II-2 or IMO HSC Code(International Code of Safety for High-speed Craft).</td></tr>
<tr><td>-<br>Hydrofoil<br>Side Wall<br>Air Cushion Vehicle<br>Hover Craft<br>Catamaran<br>Submersible</td><td>-<br>Cargo<br>Container<br>Leisure<br>Car Ferry(19-4)(23-1)<br>Car Ferry(SCS)(23-2)<br>RoRo(23-3)</td><td>Max. submerging depth and time for submersible</td></tr>
<tr><td>15-1.<br>Tug Boat<br>(2020)</td><td colspan="3">A*<br>(Purpose)<br><br>-<br>Salvage<br>Supply<br>Anchor<br>Fire-Fighting(GA or GC)(24)<br>Oil Recovery(GA, GB or GC)(25)</td><td>A* : In relation to Special Feature Notation, A(Purpose), Offshore Support Vessel's special feature notations, FFS1, FFS2, FFS3 or FF, shall be assigned to ships if they are complied with Ch 8 of Guidance for OSV and the requirements of FFS1, FFS2, FFS3 or FF, which are Special Feature Notations of Offshore Support Vessel. (2021)<br><br>- : Additional notation is not required for tug boats or pushers built only for the purpose of tug or pusher work.</td></tr>
<tr><td>15-2.<br>Pusher<br>(2018)</td><td colspan="3">-<br>(Type A)<br>(Type B)<br><br>Pusher/Tug<br>(Type A)<br>(Type B)</td><td>(24) : When it complies with the “Enforcement Regulations of Ship Arrival and Departure, Annex 2, Standards for Fire Extinguishing Facilities,” etc., the “Fire-Fighting” specialty feature notations shall be granted. GA or GC are shown in the following:<br><br>1) GA : Regarding the fire fighting equipment for other vessels, this notation shall be assigned to ships complied with the requirements for explosion-protected electrical equipment in dangerous zone.<br><br>2) GC : Regarding the fire fighting equipment for other vessels, this notation shall be assigned to ships not applied to the requirements for explosion-protected electrical equipment in dangerous zone.<br><br>Type A : permanent connection type<br>Type B : removable connection type</td></tr>
</table>

| Ship Types | Special Feature Notations | Remarks |
|---|---|---|
| 16. Work Vessel | A*<br>(Purpose) | A* : Offshore Support Vessel's special feature notations, FFS1, FFS2, FFS3 or FF, shall be assigned to ships if they are complied with **Ch 8** of Guidance for OSV and the requirements of FFS1, FFS2, FFS3 or FF, which are Special Feature Notations of Offshore Support Vessel. *(2021)*<br><br>- : Additional notation is not required for work vessels built only for the purpose of work.<br><br>(25) : As shown in the following:<br><br>1) GA : This notation shall be assigned to ships equipped for recovery and storage of spilled oil, and complied with the requirements for explosion-protected electrical equipment in dangerous zone.<br><br>2) GB : This notation shall be assigned to ships equipped for the recovery and storage of spilled oil, and complied with the requirements for explosion-protected electrical equipment at work and storage spaces.<br><br>3) GC : This notation shall be assigned to ships equipped for the recovery and storage of spilled oil, and not applied to the requirements for explosion-protected electrical equipment |
| | -<br>Launch<br>Cable Layer<br>Crane<br>Anchor<br>Ice Breaker<br>Supply<br>Oil Recovery(GA, GB or GC)(25)<br>Salvage<br>Repair Work<br>Tender<br>Drgdging *(2019)* | |
| 17. Special Purpose Ship | A*<br>(Purpose) | A* : Offshore Support Vessel's special feature notations, FFS1, FFS2, FFS3 or FF, shall be assigned to ships if they are complied with **Ch 8** of Guidance for OSV and the requirements of FFS1, FFS2, FFS3 or FF, which are Special Feature Notations of Offshore Support Vessel. *(2021)*<br><br>- : Additional notation is not required for Special Purpose Ships built only for the purpose of special purpose. *(2021)* |
| | - *(2019)*<br>Soil<br>Geological<br>Survey Boat<br>Submersible Support<br>Diving Support<br>Hopper/Waste<br>Waste<br>Hospital<br>Hydro Survey<br>Seismic Survey<br>Fire-Fighting(GA or GC)(24)<br>Buoy Laying<br>Fishery Training<br>Fishery Patrol<br>Fishery Research<br>Patrol<br>Pilot<br>Observation<br>Training<br>Research | |

<table>
<tr><th>Ship Types</th><th colspan="2">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td rowspan="2">18. Barge<br>(FAC)[1]<br>(FAO)[1]<br>(FBC)[1]</td><td>A<br>(Type)</td><td>B<br>(Loaded cargo name or additional purpose)</td><td rowspan="2">- : Additional notation is not required for barge excluding 3 types of barge below, and for barges with hatch opening on the deck and built to carry cargo in cargo holds.<br><br>(26) : See special feature for chemical tanker as shown in row 3.<br><br>(27) : See special feature for liquefied gas carrier as shown in row 2-1. (2022)<br><br>Type A : permanent connection type<br>Type B : removable connection type</td></tr>
<tr><td>-<br>Pontoon<br>Integrated<br>Pusher Barge<br>(Type A)<br>(Type B)<br>Hopper(or Dump)</td><td>Chemical[26]<br>Liquiefied Gas[27]<br>Oil<br>Container<br>Sand<br>Crane<br>Pipe-Laying<br>Piling<br>Cable-Laying<br>Salvage<br>Submersible<br>Accommodation<br>Waste<br>Log<br>Heavy Cargo<br><br>Oil Recovery (GA, GB or GC)[25]<br><br>Power Plant (2019)<br><br>Wind Turbine Transportation (2019)<br><br>Harbor Construction (Crane, Dredger, Piling or Ground Amelioration ) (2023)</td></tr>
</table>

<table>
<tr><th>Ship Types</th><th colspan="4">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td>19-1. Dredger<br><br>19-2. Dredger<br>(Self-propelled)</td><td colspan="4">Trailing Suction<br>Cutter Suction<br>Grab<br>Bucket<br>Dipper<br>Suction/Dump</td><td></td></tr>
<tr><td rowspan="2">20. Special Purpose Submersible</td><td>A</td><td>B</td><td>C</td><td>D</td><td rowspan="2">(28) : This notation shall be assigned to special purpose submersible accompanying personnel not exceeding 13.</td></tr>
<tr><td>Manned<br>Unmanned</td><td>Self-propelled<br>Non-propelled</td><td>Research<br>Rescue<br>Leisure(28)<br>Special<br>Work</td><td>Max. sub-merging depth and time</td></tr>
<tr><td rowspan="2">21. Fixed Offshore Structure</td><td colspan="2">A(Type)</td><td colspan="2">B(Purpose)</td><td rowspan="2"></td></tr>
<tr><td colspan="2">Jacket<br>GBS<br>Compliant Tower<br>Articulated Tower</td><td colspan="2">Drilling<br>Production</td></tr>
<tr><td rowspan="2">22. Mobile Offshore Unit</td><td colspan="2">A(Type)</td><td colspan="2">B(Purpose)</td><td rowspan="2"></td></tr>
<tr><td colspan="2">Self-elevating<br>Column-stabilized<br>Ship Type<br>Barge Type</td><td colspan="2">Crane<br>Accommodation<br>Floating Pier<br>Plant (2024)<br>WTIMR (2024)</td></tr>
<tr><td rowspan="2">23. Mobile Offshore Drilling Unit</td><td colspan="4">A(Type)</td><td rowspan="2"></td></tr>
<tr><td colspan="4">Self-elevating<br>Column-stabilized<br>Ship Type<br>Barge Type</td></tr>
<tr><td rowspan="2">24-1. Floating Production, Storage and Offloading Unit<br><br>24-2. Floating Production and Offloading Unit<br><br>24-3. Floating Storage and Offloading Unit</td><td>A(Type)</td><td>B</td><td>C</td><td rowspan="2">(C) : This notation shall be assigned when an existing vessel is converted to a floating production unit and is classed with the Society.<br><br>Disconnectable :<br>This notation shall be assigned for the floating production unit that has a propulsion system and a means of disengaging the unit from its mooring and riser systems.</td></tr>
<tr><td>Ship Type<br>Barge Type<br>Column-stabilized<br>Spar<br>TLP</td><td>(C)<br>Disconnectable</td><td>Production<br>Import<br>Export<br>Import-Export</td></tr>
</table>

<table>
<tr><th>Ship Types</th><th colspan="2">Special Feature Notations</th><th>Remarks</th></tr>
<tr><td rowspan="2">25-1-1. Floating LNG Storage and Regasification Unit (2019)</td><td>A</td><td>B</td><td rowspan="5">(C) : This notation shall be assigned when an existing vessel is converted to a floating liquefied gas unit and is classed with the Society.<br><br>Disconnectable :<br>This notation shall be assigned for the floating liquefied gas unit that has a propulsion system and a means of disengaging the unit from its mooring and riser systems.</td></tr>
<tr><td>(C)<br>Disconnectable</td><td>Regasification<br>Export</td></tr>
<tr><td>25-1-2. Floating LNG Regasification Unit (2019)</td><td>(C)<br>Disconnectable</td><td>Regasification<br>Export</td></tr>
<tr><td>25-1-3. Floating LNG Storage Unit (2019)</td><td>(C)<br>Disconnectable</td><td>Export</td></tr>
<tr><td>25-2. Floating LNG Production, Storage and Offloading Unit</td><td>(C)<br>Disconnectable</td><td>Process<br>Import</td></tr>
<tr><td rowspan="2">26. Offshore Support Vessel</td><td>A</td><td>B</td><td rowspan="2"></td></tr>
<tr><td>Supply<br>AH<br>Tow<br>HL<br>WTIMR<br>FFS1<br>FFS2<br>FFS3<br>FF<br>Oil Spill Recovery</td><td>HDC($P$, Locations)<br>HLC($\rho$, Tanks)</td></tr>
<tr><td>27-1. Floating Dock</td><td colspan="2" rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>27-2. Dock Gate</td></tr>
<tr><td>27-3. Launching Skid Barge</td></tr>
<tr><td>28. Refrigerated Cargo Carrier</td><td colspan="2"></td><td></td></tr>
<tr><td rowspan="2">29. Single Point Mooring (2017) (31)</td><td>A (Type)</td><td>B (Equipment)</td><td rowspan="2">(31) : See examples given in Ch 1 103. 1. of Guidance for Single Point Mooring.</td></tr>
<tr><td>CALM<br>SALM<br>VALM<br>SPMT</td><td>Buoy Body<br>Sub-sea Pipeline<br>Anchor Leg<br>PLEMFloating Hose</td></tr>
<tr><td>30. Floating Structure</td><td colspan="2">Hotel<br>Restaurant<br>Leisure</td><td></td></tr>
<tr><td rowspan="2">31. Shiplift and Transfer System (2018) (32)</td><td>A (Port to be installed)</td><td>B (Total net lifting capacity)</td><td rowspan="2">(32) : See example given in Ch 1 Section 1 & Section 2 of Guidance for Shiplift and Transfer system</td></tr>
<tr><td>(port to be specified)</td><td>MDL x effective platform length</td></tr>
</table>

| Ship Types | Special Feature Notations | | Remarks |
|---|---|---|---|
| | A (Type)[33] | B (Purpose)[34] | [33] : See **Ch. 1, 104.** in Guidance for WIG Craft (Wing-in-ground effect craft)<br>[34] : See **Ch. 1, 103. 11~13.** in Guidance for WIG Craft |
| 32. WIG Craft *(2019)* | A-type<br>B-type | Passenger<br>General<br>Small(Commercial)<br>Small(Non-commercial) | |
| 33. Floating LNG Bunkering Terminal *(2018)* | | | This notation shall be assigned to a barge comply with the requirements specified in **Guidance for Floating LNG Bunkering Terminal.** |

(Remarks) [35] : The following Additional Special Feature Notations are to be appended to ships complying with the relevant requirements. The Additional Special Feature Notations are to be located under Service Restriction Notations of Hull after Special Feature Notations regardless whether they are hull items or machinery items. *(2023)*

| Additional Special Feature Notations | | Relevant Requirements |
|---|---|---|
| SeaTrust (DSA1, DSA2, FSA1, FSA2, FSA3, SPR1, SPR2, HCM) *(2020)* | DSA1, DSA2, FSA1, FSA2, FSA3 | to ships comply with the Guidance for the direct structure and fatigue assessment specified in **Pt 3, Annex 3-2** and **3-3**. However, the (CSR) notation includes SeaTrust(DSA1, FSA2[NA]) notations, not additionally assigned. For container ships in accordance with **Pt 14**, ships complying with **Pt 14, Ch 7** and **Ch 9** are assigned the notation SeaTrust(DSA1, FSA2).<br>The notations of FSA1 to FSA3 are assigned including the following notation about evaluated sea area:<br>[NA] : North Atlantic, [WW] : Worldwide,<br>(e.g. SeaTrust(FSA1[NA]), SeaTrust(FSA1[WW])).<br>The notation of [XX years] can be assigned to FSA1 to FSA3 additionally when exceeding the following design fatigue life:<br>to ships comply with **Pt 13** and **Pt 14**: 25 years,<br>to other ships : 20 years,<br>(e.g. SeaTrust(FSA1[WW, 30 years])). |
| | SPR1, SPR2 | to ships comply with the fatigue strength requirements specified in **Guidance for Fatigue Strength Assessment Including Springing.** |
| | HCM | to ships comply with the Guidance for the hull construction monitoring procedure, **Pt 3, Annex 3-4.** However, for the ship built in accordance with **Common Structural Rules for Bulk Carriers and Oil Tankers**(**Pt 13**), Hull Consturction Monitoring notation, SeaTrust(HCM), shall be assigned mandatory. |
| WHIP *(2017)* | | to ships comply with the strength requirements specified in **Guidance on Strength Assessment of Containerships considering the Whipping Effect** |
| IA Super | | to ships where IA Super Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| IA | | to ships where IA Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| IB | | to ships where IB Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| IC | | to ships where IC Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| ID | | to ships where ID Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| Ice II *(2021)* | | to ships where II Classification of Ice Strengthening specified in **Ch 1** of the **Guidance for Ships for Navigation in Ice** is applied. |
| PC1, PC2, PC3, PC4, PC5, PC6, PC7 | | to ships comply with Polar Class specified in **Ch 2** of the **Guidance for Ships for Navigation in Ice.** |
| Icebreaker3, Icebreaker4, Icebreaker5, Icebreaker6 | | to ships comply with Icebreaker Class specified in **Ch 3** of the **Guidance for Ships for Navigation in Ice.** |
| Arctic4, Arctic5, Arctic6, Arctic7, Arctic8, Arctic9 *(2017)* | | to ships with ice breaking capability comply with Arctic Class specified in **Ch 3** of the **Guidance for Ships for Navigation in Ice.** Where a ship performs ice breaking operations periodically and complies with the relevant requirements of Icebreaker, one of Icebreaker3 or Icebreaker4 notations may be assigned additionally. |

<table>
<tr><th colspan="2">Additional Special Feature Notations</th><th colspan="2">Relevant Requirements</th></tr>
<tr><td rowspan="6">Winterization (H(t), M(t), E1(t), E2(t), E3(t), S(A), S(B), S(C), D(t), IR) (2018)</td><td>H(t)</td><td colspan="2">to ships where materials for hull construction at an external design air temperature of t degrees Celsius specified in Ch 4, Sec 2 of the Guidance for Ships for Navigation in Ice are applied.</td></tr>
<tr><td>M(t)</td><td colspan="2">to ships where materials for equipment and components at an external design air temperature of t degrees Celsius specified in compliance with Ch 4, Sec 3 of the Guidance for Ships for Navigation in Ice are applied.</td></tr>
<tr><td>E1(t), E2(t), E3(t)</td><td colspan="2">to ships where equipment and systems are in compliance with Ch 4, Sec 4, Sec 5 and Sec 6 of the Guidance for Ships for Navigation in Ice in association with an external design air temperature of t degrees Celsius.</td></tr>
<tr><td>S(A), S(B), S(C)</td><td colspan="2">to ships where stability are in compliance with Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice in association with the ice accretion values specified in Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice.</td></tr>
<tr><td>D(t)</td><td colspan="2">to ships where alternative designs complied with Ch 4, Sec 8 of the Guidance for Ships for Navigation in Ice in association with an external design air temperature of t degrees Celsius are applied.</td></tr>
<tr><td>IR</td><td colspan="2">to ships where ice removal specified in compliance with Ch 4, Sec 9 of the Guidance for Ships for Navigation in Ice is applied.</td></tr>
<tr><td colspan="2">PL10, Icebreaker PL10, PL20, Icebreaker PL20, PL30, Icebreaker PL30</td><td>to ships comply with POLAR class specified in Pt 3, Ch 22 of the Guidance which was specified until 1 January 2015.</td><td rowspan="2">1. However, arctic class ships intended for special services where intermediate ice condition value are relevant may, upon special consideration, be given intermediate notations(e.g. PL25).<br>The design ambient air temperature, the maximum operational speed and/or the maximum amidships draught may be assigned, if applicable, in accordance with Pt 3, Ch 22 of the Guidance which was specified until 1 January 2015, and the design ambient air temperature shall be assigned as DAT(-x°C).<br>2. Only ships which had been assigned these notations before 1 January 2015 can keep these notations, but these notations are not to be newly assigned to any ships after 1 January 2015.</td></tr>
<tr><td colspan="2">ICE05, Icebreaker ICE05, ICE10, Icebreaker ICE10, ICE15, Icebreaker ICE15</td><td>to ships comply with ICE class specified in Pt 3, Ch 22 of the Guidance which was specified until 1 January 2015.</td></tr>
<tr><td colspan="2">FH</td><td colspan="2">to ships where the requirements regarding longitudinal strength of hull girder in flooded condition, evaluation of allowable hold loading and evaluation of scantlings of corrugated transverse watertight bulkheads for bulk carriers specified in Pt 7, Ch 3, Sec 10 to Sec 12 of the Rules are applied.</td></tr>
<tr><td colspan="2">IWS</td><td colspan="2">to ships that meet the requirements specified in Ch 2, 604. 3 (8) of the Rules for the purpose of carrying out In-water Survey more smoothly. (2024)</td></tr>
<tr><td colspan="2">ERS</td><td colspan="2">to ships where classed with the Emergency Response Service System of the Society.</td></tr>
<tr><td colspan="2">ERS(D) (2025)</td><td colspan="2">to ships classed with the Service System for the prediction of trajectory route of Vessel drift and oil spill among the ships where classed with the Emergency Response Service System of the Society.</td></tr>
<tr><td colspan="2">CDG</td><td colspan="2">to ships comply with the requirements specified in Pt 8, Ch 12 of the Rules.</td></tr>
<tr><td colspan="2">AFP-A</td><td colspan="2">to ships comply with the requirements specified in Pt 8, Annex 8-9, Sec.2 of the Guidance.</td></tr>
<tr><td colspan="2">AFP-M</td><td colspan="2">to ships comply with the requirements specified in Pt 8, Annex 8-9, Sec.3 of the Guidance.</td></tr>
</table>

| Additional Special Feature Notations | Relevant Requirements |
|---|---|
| AFP-C<br>AFP-C(1)<br>AFP-C(2)<br>AFP-C(3)<br>AFP-C(FSC)<br>AFP-C(EV) *(2023)* | AFP-C : to ships comply with the related requirements specified in **Pt 8, Annex 8-9, Sec 4** of the Guidance.<br>AFP-C(1) : to container ships where cargo space in accordance with the requirements specified in **Pt 8, Annex 8-9, Sec 4, 405. 2** of the Guidance.<br>AFP-C(2) : to container ships where cargo space in accordance with the requirements specified in **Pt 8, Annex 8-9, Sec 4, 405. 3** of the Guidance.<br>AFP-C(3) : to container ships where cargo space in accordance with the requirements specified in **Pt 8, Annex 8-9, Sec 4, 405. 4** of the Guidance.<br>AFP-C(FSC) : to container ships where cargo space in accordance with the requirements specified in **Pt 8, Annex 8-9, Sec 4, 405. 5** of the Guidance.<br>AFP-C(EV) : to PCC notation assigned pure car carriers or pure car/truck carriers where cargo space in accordance with the requirements specified in **Pt 8, Annex 8-9, Sec 4, 402. 3** of the Guidance.*(2024)* |
| SPS | to ships comply with the Code of Safety for Special Purpose Ships(SPS Code). |
| IP *(2024)* | to ships comply with the Code of Safety for Ships Carrying Industrial Personnel(IP Code). |
| Grab | to ships where cargo holds are protected from loading/discharge equipment in accordance with the requirements specified in **Pt 7, Annex 7-7, 2** of the Guidance. |
| PCP | to ships where the cargo oil pipings are protected according to the requirements specified in **Pt 7, Ch 1, 1002. 4** of the Guidance. |
| IHM | to ships which comply with Hong Kong international convention for the safe and environmentally sound recycling of ships. |
| CLEAN1,<br>CLEAN2,<br>CLEAN3 | to ships which comply with the additional requirements for pollution prevention system specified in **Ch 1** of Guidance for **Prevention System of Pollution from ships.** *(2021)* |
| PSPC | to ships comply with the Performance Standard for Protective Coatings specified in **Pt 3, Ch 1, 801**. of the Guidance. |
| BLU | to ships comply with the additional requirements for the safe loading and unloading specified in **Pt 3, Annex 3-1, 3** (3) of the Guidance. |
| EDD | to ships carrying out the Extended Dry-docking Interval System specified in **Ch 2, 605.** of the Rules. |
| OHIMP | to ships comply with the Owner's Hull Inspection and Maintenance Program specified in **Annex 1-13** of the Guidance. |
| (LC), (LC-G),<br>(HSLC - SA0, SA1, SA2, SA3, SA4, SA5)<br>*(2018)* | LC : to Light Craft as specified in **Pt 1, Ch 1, 103.** (1) of the **Rules for the Classification of High Speed and Light Crafts.**<br>LC-G : to Light Craft as specified in **Annex 1 and Annex 2 of the Guidance relating to the Rules for the Classification of High Speed and Light Crafts, 1998 edition.**<br>HSLC : to High Speed and Light Craft as specified in **Pt 1, Ch 1, 103.** (2) of the **Rules for the Classification of High Speed and Light Crafts.**<br>SA0, SA1, SA2, SA3, SA4, SA5<br>: The service restriction notation specified in **Pt 3, Ch 1, 121.** of the **Rules for the Classification of High Speed and Light Crafts.** |

<table>
<tr><th>Additional Special Feature Notations</th><th>Relevant Requirements</th></tr>
<tr><td>(HSC),<br>(HSC-A),<br>(HSC-B),<br>(FGHSC)</td><td>(HSC) : to High-speed Crafts, other than High-speed Passenger Crafts, comply with IMO HSC Code(International Code of Safety for High-speed Craft)<br>(HSC-A) : to High-speed Category A Passenger Crafts comply with IMO HSC Code(International Code of Safety for High-speed Craft)<br>(HSC-B) : to High-speed Category B Passenger Crafts comply with IMO HSC Code(International Code of Safety for High-speed Craft)<br>(FGHSC) : to High-speed Crafts engaged in domestic voyages, comply with the flag administration's domestic laws for High-speed Crafts, not comply with IMO HSC Code(International Code of Safety for High-speed Craft)</td></tr>
<tr><td>LFFS<br>(DF-LNG, SF-LNG)<br>(DF-Methanol, SF-Methanol)<br>(DF-Ethanol, SF-Ethanol)</td><td>to ships comply with the requirements of the Rules and Guidance for the Classification of Ships Using Low-flashpoint Fuels in which low-flashpoint fuelled engine installations are installed, other than ships carrying liquefied gases in bulk.
<table>
<tr><td>DF-LNG</td><td>Dual fuel engines using LNG as fuel are installed</td></tr>
<tr><td>SF-LNG</td><td>Single fuel engines using LNG as fuel are installed</td></tr>
<tr><td>DF-Methanol</td><td>Dual fuel engines using methyl alcohol as fuel are installed</td></tr>
<tr><td>SF-Methanol</td><td>Single fuel engines using methyl alcohol as fuel are installed</td></tr>
<tr><td>DF-Ethanol</td><td>Dual fuel engines using ethyl alcohol as fuel are installed</td></tr>
<tr><td>SF-Ethanol</td><td>Single fuel engines using ethyl alcohol as fuel are installed</td></tr>
</table></td></tr>
<tr><td>LNG Ready D(A) (2022)</td><td>to ships for which the concept Design is prepared in accordance with Ch 2, Sec 2 of the Guidance for LNG Fuel Ready Ships.</td></tr>
<tr><td>LNG Ready D</td><td>to ships for which the generic Design is prepared in accordance with Ch 2, Sec 3 of the Guidance for LNG Fuel Ready Ships.</td></tr>
<tr><td>LNG Ready I<br>(SR, FT, TV, FS, BS, ME, AE, B, ME-C, AE-C, B-C) (2017)</td><td>to ships for which parts of the systems are installed with the detailed design in accordance with Ch 2, Sec 4 of the Guidance for LNG Fuel Ready Ships</td></tr>
<tr><td>FC, FC-PWR</td><td>to ships comply with the requirements of the Guidance for Fuel Cell Systems on Board of Ships in which fuel cell systems on board of ships used as auxiliary or main source of power are installed.</td></tr>
<tr><td>CEmN-E&F (2021)</td><td>to ships reducing emission of nitrogen oxides by adjusting combustion environment and/or fuel used in engines specified in Ch 2, Sec 1 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>CEmN-SCR (2021)</td><td>to ships comply with the requirements for the selective catalytic reduction system specified in Ch 2, Sec 2 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>CEmN-EGR(R, S) (2021)</td><td>to ships comply with the requirements for the exhaust gas recirculation systems specified in Ch 2, Sec 3 of the Guidance for Prevention System of Pollution from ships.<br>EGR : to ships comply with basic requirements for exhaust gas recirculation system<br>EGR(R): to ships comply with redundancy requirements in addition to basic requirements<br>EGR(S): to ships comply with type approval or test/survey requirements in addition to basic requirements</td></tr>
</table>

<table>
<tr><th>Additional Special Feature Notations</th><th>Relevant Requirements</th></tr>
<tr><td>CEmS-EGC(R, S)<br>-D, O, C, H<br>(2021)</td><td>to ships comply with the requirements for the exhaust gas cleaning system specified in Ch 3, Sec 2 of the Guidance for Prevention System of Pollution from ships<br>EGC : to ships comply with basic requirements for exhaust gas cleaning system<br>EGC(R): to ships comply with redundancy requirements in addition to basic requirements<br>EGC(S): to ships comply with type approval or test/survey requirements in addition to basic requirements<br><br>An additional notation may be assigned to ships according to a type of system
<table>
<tr><td>-D</td><td>Dry type</td></tr>
<tr><td>-O</td><td>Wet open type</td></tr>
<tr><td>-C</td><td>Wet closed type</td></tr>
<tr><td>-H</td><td>Wet hybrid type</td></tr>
</table>
</td></tr>
<tr><td>EGC Ready D-D, O, C, H (2019)</td><td>to ships for which the generic design is prepared in accordance with Ch 3 Sec 3 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>EGC Ready I(SR, EX, WR, CH, SD, EG)-D, O, C, H (2019)</td><td>to ships for which parts of the systems are installed with the detailed design in accordance with Ch 3 Sec.3 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>CEmS-LSF (2021)</td><td>to ships using low sulphur fuel without exhaust gas cleaning system specified in Ch 3 Sec.1 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>EEDI-P3,<br>EEDI-ER[x] (2022)</td><td>to ships comply with the additional requirements for the energy efficiency design index(EEDI) specified in Ch 4 of the Guidance for Prevention System of Pollution from ships.</td></tr>
<tr><td>ES-Wind, ES-Wind1<br>(2022)</td><td>to ships comply with Ch 5 of the Guidance for Prevention System of Pollution from ships<br>ES-Wind : to ships comply with basic requirements for wind assisted propulsion system<br>ES-Wind1 : to ships comply with additional requirements as well as the basic requirements</td></tr>
<tr><td>ES-ALS, ES-ALS1<br>(2023)</td><td>to ships comply with Ch 6 of the Guidance for Prevention System of Pollution from ships<br>ES-ALS : to ships comply with basic requirements for hull air lubrication system<br>ES-ALS1: to ships comply with additional requirements as well as the basic requirements</td></tr>
<tr><td>CEmC-OCCS (R, S)<br>(2023)</td><td>to ships comply with the requirements for the onboard carbon capture and storage system specified in Ch 7 of the Guidance for Prevention System of Pollution from ships<br>OCCS : to ships comply with basic requirements for onboard carbon capture and storage system<br>OCCS(R) : to ships comply with redundancy requirements in addition to basic requirements<br>OCCS(S) : to ships comply with type approval or test/survey requirements in addition to basic requirements</td></tr>
<tr><td>OCCS Ready<br>D(A), D, I<br>(2023)</td><td>to ships for which is ready to potential installation of onboard carbon capture and storage system in accordance with Ch 8 of the Guidance for Prevention System of Pollution from ships<br>D(A): ships for which the concept design is prepared<br>D : ships for which the generic design is prepared<br>I : ships for which parts of the systems are installed with the detailed design in addition to the generic design</td></tr>
<tr><td>NVH-N1, NVH-N2,<br>NVH-N3 (2017)</td><td>to ships comply with the additional requirements for Noise Criteria specified in Ch 3, of the Guidance for Noise and Vibration.</td></tr>
<tr><td>NVH-V1, NVH-V2,<br>NVH-V3 (2017)</td><td>to ships comply with the additional requirements for Vibration Criteria specified in Ch 4, of the Guidance for Noise and Vibration.</td></tr>
</table>

<table>
<tr><th>Additional Special Feature Notations</th><th>Relevant Requirements</th></tr>
<tr><td>URN(NXX), URN(QXX), URN(RXX), URN(SXX), URN(THR) (2024)</td><td>to ships comply with the additional requirements for the underwater radiated noise specified in Ch 3 of the Guidance for Radiated Noise from Ships.<br>URN : Underwater Radiated Noise<br>N : Normal mode, Q : Quiet mode,<br>R : Research mode, S : Seismic survey mode,<br>THR : THRuster mode,<br>XX : Integer ship speed (knots) in still water corresponding to the propeller output at each mode</td></tr>
<tr><td>ARN(SM), ARN(S1), ARN(S2), ARN(BM), ARN(B1), ARN(B2) (2024)</td><td>to ships comply with the additional requirements for the external airborne noise specified in Ch 4 of the Guidance for Radiated Noise from Ship.<br>ARN : Airborne Radiated Noise<br>SM : ARN for Sailing is Measured<br>BM : ARN for Berthing is Measured</td></tr>
<tr><td>CS1, CS2, CS3, (2020)</td><td>to ships operating the maritime cyber security system specified in the Guidance for Maritime Cyber Security System</td></tr>
<tr><td>CS READY (2019)</td><td>to ships with the maritime cyber security system specified in the Guidance for Maritime Cyber Security System</td></tr>
<tr><td>AL1, AL2, AL3, AL4, AL5 (2019)</td><td>to ships with the autonomous systems specified in the Guidance for Autonomous Ships</td></tr>
<tr><td>CSAP (2019)</td><td>to ships comply with the additional requirements specified in Pt. 7 Annex 7-11 Guidelines on providing safe working conditions for securing of containers on deck</td></tr>
<tr><td>FTS (2019)</td><td>to ships where fuel oil treatment system specified in Pt 5, Ch 6, Annex 5-13 of the Guidance are provided onboard. (Fuel oil Treatment System)</td></tr>
<tr><td>ISPM(0), ISPM(1), ISPM(2), ISPM(3) (2020)</td><td>to ships operating the integrated software process specified in the Guidance for Integrated software Process Management</td></tr>
<tr><td>PID, MID (2023)</td><td>to ships comply with the requirements to prevent the spread of infectious disease in the event of an outbreak of an infectious disease on board in Guidance for Ships designed to Prevent the spread of Infectious Disease<br>( PID : Prevention of the spread of Infectious Disease,<br>MID: Mitigation of the spread of Infectious Disease)</td></tr>
<tr><td>RP1, RP2, RP1-S, RP2-S</td><td>to ships comply with the additional requirements for the redundant propulsion and steering systems specified in Pt 5, Annex 5-10 of the Guidance. (2019)</td></tr>
<tr><td>ESA1, ESA2 (2022)</td><td>to ships which comply with the requirements of enhanced shaft alignment specified in Pt 5, Annex 5-12-1 of the Guidance. (Enhanced Shaft Alignment)</td></tr>
<tr><td>Methanol and/or Ethanol Ready D(A) (2022)</td><td>to ships for which the Concept Design is prepared in accordance with Sec 18, Annex 5 of the Guidances Relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels. (Approval in principle)
<table>
<tr><td>Methanol and Ethanol Ready D(A)</td><td>to ships suitable for methyl alcohol and ethyl alcohol fuel ready level</td></tr>
<tr><td>Methanol Ready D(A)</td><td>to ships suitable for methyl alcohol fuel ready level</td></tr>
<tr><td>Ethanol Ready D(A)</td><td>to ships suitable for ethyl alcohol fuel ready level</td></tr>
</table></td></tr>
<tr><td>Methanol and/or Ethanol Ready D (2022)</td><td>to ships for which the generic Design is prepared in accordance with Sec 18, Annex 5 of the Guidances Relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels.
<table>
<tr><td>Methanol and Ethanol Ready D</td><td>to ships suitable for methyl alcohol and ethyl alcohol fuel ready level</td></tr>
<tr><td>Methanol Ready D</td><td>to ships suitable for methyl alcohol fuel ready level</td></tr>
<tr><td>Ethanol Ready D</td><td>to ships suitable for ethyl alcohol fuel ready level</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Additional Special Feature Notations</th><th>Relevant Requirements</th></tr>
<tr><td>Methanol and/or Ethanol Ready I (SR, FT, TV, FS, BS, ME, AE, ME-C, AE-C) (2022)</td><td>to ships for which parts of the systems are installed with the detailed design in accordance with Sec 18, Annex 5 of the Guidances Relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels.<br>(partial Installation)
<table>
<tr><td>Methanol and Ethanol Ready I</td><td>to ships suitable for methyl alcohol and ethyl alcohol fuel ready level</td></tr>
<tr><td>Methanol Ready I</td><td>to ships suitable for methyl alcohol fuel ready level</td></tr>
<tr><td>Ethanol Ready I</td><td>to ships suitable for ethyl alcohol fuel ready level</td></tr>
</table>
SR : hull Structure Reinforcement for fuel tank<br>FT : Fuel Tank<br>TV : fuel Tank Venting systems<br>FS : Fuel Supply systems<br>BS : fuel Bunkering Systems<br>ME : Methyl alcohol and/or Ethyl alcohol fired Main Engines<br>AE : Methyl alcohol and/or Ethyl alcohol fired Auxiliary Engines,<br>ME-C : Methyl alcohol and/or Ethyl alcohol fired Main Engine - Conversion<br>AE-C : Methyl alcohol and/or Ethyl alcohol fired Auxiliary Engines - Conversion</td></tr>
<tr><td>Reduced Freeboard (2023)</td><td>to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers</td></tr>
<tr><td>ETA (2025)</td><td>to ships where the Emergency Towing Arrangement specified in Pt 4, Ch 8, 205. of the Rules is applied.</td></tr>
<tr><td>LSN (2025)</td><td>to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC<br>(Lashing Software for Nonstandardized cargo)</td></tr>
</table>

### 1.2 Additional Installations Notations

The following Additional Installations Notations may be appended to ships complying with the relevant requirements.

<table>
<tr><th colspan="2">Additional Installations Notations</th><th>Relevant Requirements</th></tr>
<tr><td rowspan="9">Hull Items</td><td>HMS (G,W,SD,S, U,LS) (2023)</td><td>to ships where the Hull Monitoring System specified in Pt 9, Ch 6 of the Rules is provided on board.</td></tr>
<tr><td>LG (F, P, OC, PA, IP) (2025)</td><td>to ships where the Cargo Handling Appliance specified in Pt 9, Ch 2 of the Rules are provided on board.
<table>
<tr><td>F</td><td>Cargo handling appliances that satisfy the registration inspection in accordance with Pt 9, Ch 2, 203. of the Rules, where "F" stands for "fully."</td></tr>
<tr><td>P</td><td>Cargo handling appliances that satisfy only the registration inspection specified in Pt 9, Ch 2, 203., 2 (2) of the Rules, where "P" stands for "partially."</td></tr>
<tr><td>OC</td><td>Offshore cranes among the cargo handling appliances that satisfy the registration inspection in accordance with Pt 9, Ch 2, 203. of the Rules</td></tr>
<tr><td>PA</td><td>Personnel lifting appliances among the cargo handling appliances that satisfy the registration inspection in accordance with Pt 9, Ch 2, 203. of the Rules.</td></tr>
<tr><td>IP</td><td>Personnel lifting appliances among the cargo handling appliances that satisfy the registration inspection in accordance with Pt 9, Ch 2, 203. of the Rules, installed on ships subject to the IP code and satisfying the relevant requirements</td></tr>
</table>
The maximum significant wave height for the operation of cranes can be added to the classification notation in the form of [X.X] (e.g., an offshore crane operable at a maximum significant wave height of 3.0 m: LG(F, OC[3.0]))</td></tr>
<tr><td>LI</td><td>to ships where the Loading Instrument on Stability specified in Ch 1, 307. of the Rules or the Longitudinal Strength Loading Instrument specified in Pt 3, Ch 3, 104. of the Rules is provided on board.</td></tr>
<tr><td>EQ-SPM</td><td>to ships where the Equipment Employed in the Mooring of Ships at Single Point Mooring specified in Pt 4, Ch 10, 101. 7 of the Rules is provided on board.</td></tr>
<tr><td>PKS</td><td>to offshore units where the Position Keeping System specified in Ch 4, Sec 6 of the Rules for the Classification of Mobile Offshore Units or Ch 3, 415. of the Rules for Mobile Offshore Drilling Units is provided on board.</td></tr>
<tr><td>SUR, BOU, SAT</td><td>to ships where the diving systems specified in Pt 9, Ch 7, 602. 1 of the Rules are provided on board.</td></tr>
<tr><td>ADUW (2019)</td><td>to ships where the anchoring systems in deep and unsheltered water specified in Pt 4, Annex 4-3 of the Guidances are installed on board.</td></tr>
<tr><td rowspan="9">Machinery Items</td><td>UMA</td><td>to ships where the Operating Systems for Periodically Unattended Machinery Spaces specified in Pt 9, Ch 3 of the Rules are provided onboard.</td></tr>
<tr><td>UMA1, UMA2, UMA3</td><td>to ships where the Automation Equipment specified in Pt 9, Ch 3 of the Rules is provided on board.</td></tr>
<tr><td>CMA</td><td>to ships where the Centralized Monitoring and Control System for Main Propulsion and Essential Auxiliary Machinery specified in Pt 9, Ch 3 of the Rules is provided on board.</td></tr>
<tr><td>PMS</td><td>to ships where the Planned Maintenance System specified in Pt 1, Ch 2, 903. of the Rules is applied.</td></tr>
<tr><td>PMS-CBM (2022)</td><td>to ships where the Condition Based Maintenance System specified in Pt 1, Ch 2, 903. 3 of the Rules is applied.</td></tr>
<tr><td>PMS(S) (2025)</td><td>to ships where the Planned Maintenance System specified in Pt 1, Ch 2, 903. of the Rules with type-approved PMS Software are applied.</td></tr>
<tr><td>STCM (2017)</td><td>to ships where the Stern Tube Condition Monitoring System specified in Ch 2, 701. 3 of Guidance is provided on board.</td></tr>
<tr><td>BCM(2021)</td><td>to ships where the Boiler Condition Monitoring System specified in Ch 2, 803. of Guidance is provided on board.</td></tr>
</table>

| Additional Installations Notations | | Relevant Requirements | |
|---|---|---|---|
| Machinery Items | DPS(0), DPS(1), DPS(2), DPS(3) | to ships where the Dynamic Positioning System specified in **Pt 9, Ch 4** of the Rules is provided on board. | |
| | NBS, NBS1, NBS2 | to ships where Bridge Layouts and Bridge Working Environments, Navigation Equipments, Accident Prevention Systems and Bridge Work Assist Systems specified in **Pt 9, Ch 5** of the Rules are provided. | |
| | HVSC | to ships where the High Voltage Shore Connection Systems specified in **Pt 9, Ch 8** of the Rules are provided on board. | |
| | HVSC-Partial | to ships where a part of high voltage shore connection systems specified in **Pt 9, Ch 8** of the Guidance are provided on board. | |
| | BWE | to ships in which the ballast water exchange system is installed in accordance with **Pt 9, Ch 10, Sec 2** for ballast water management. However, ships not applying to **Pt 9, Ch 10, Sec 2** of the Rules are to comply with relevant requirements of BWE specified in **Pt 1, Annex 1-1, 1.1** of the Guidance 2015. | However, at the request of the Owner, BWMP(T, F, S, D) may be assigned to ships which have no IBWM Statement of Compliance, until the International Convention for the Control and Management of Ship's Ballast Water and Sediments has entered into force, where the requirements specified in **Pt 9, Ch 7** of the Rules 2007 are complied. |
| | BWT | to ships in which the ballast water management system is installed in accordance with Pt 9, Ch 10, Sec 3 for ballast water management. However, ships not applying to **Pt 9, Ch 10, Sec 3** of the Rules are to comply with relevant requirements of BWT specified in **Pt 1, Annex 1-1, 1.1** of the Guidance 2015. | |
| | VEC1 | to ships in which cargo **V**apour **E**mission **C**ontrol system is installed in accordance with **Pt 9, Ch 9, Sec 2 of the Rules.** However, for ships having VEC2 notation, VEC1 notation shall not be assigned. | |
| | VEC2 | to ships in which cargo vapour emission control system is installed in accordance with **Pt 9, Ch 9, Sec 3 of the Rules**.<br>However, for ships having VECL notation, VEC2 notation shall not be assigned. | |
| | VECL | to ships engaged in the transportation of cargoes between a facility and another ship and vice versa, and in which wapour balancing system are installed in accordance with **Pt 9, Ch 9, Sec 4 of the Rules.**<br>(**V**apor **E**mission **C**ontrol system - **L**ightering operation) | |
| | IGS | to ships where the **I**nert **G**as **S**ystems specified in **Pt 8, Ch 2, 405 of the Rules** are provided onboard, other than ships carrying liquefied gases in bulk.<br>to ships carrying liquefied gases in bulk where the Inert Gas Systems specified in **Pt 7, Ch 5, 905. 1** of the Rules are provided onboard. | |
| | COW | to ships where the **C**rude **O**il **W**ashing System specified in "Annex I of MARPOL" are provided onboard. | |
| | RMC | to ships where the Cargo Refrigerating Installations specified in **Pt 9, Ch 1 of the Rules** are provided onboard.<br>(**R**efrigerating **M**achinery for **C**argo) | |
| | ns-NH3 | to fishing vessels where ammonia refrigerating installations are installed in machinery spaces in accordance with the requirements specified in **Pt 5, Ch 6, 1201. 1** (14) (B) **of the Guidance.** | |

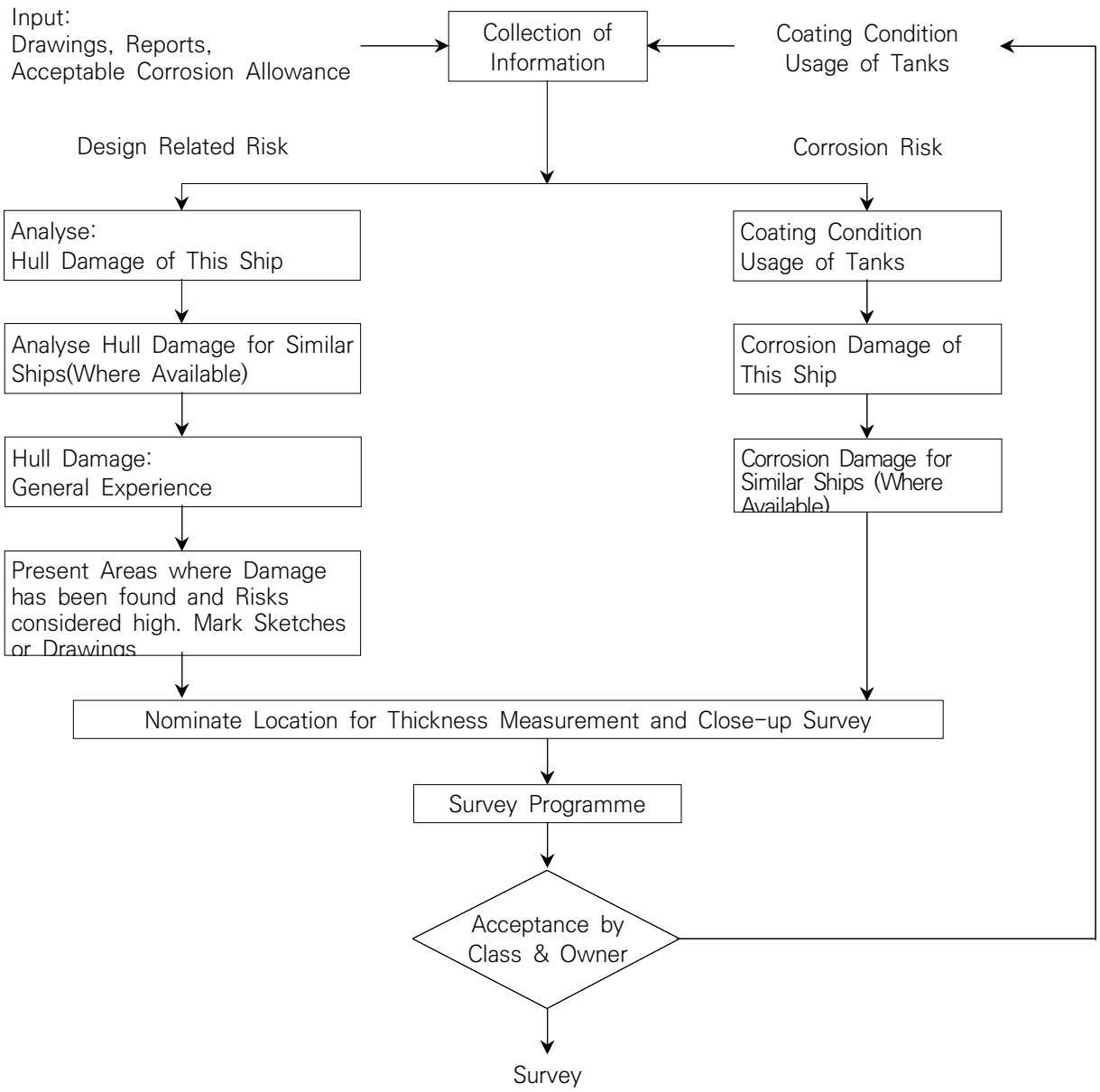
| Additional Installations Notations | | Relevant Requirements |
|---|---|---|
| Machinery Items | GCU | to ships carrying liquefied gas in bulk where the **G**as **C**ombustion **U**nit for disposal of cargo vapour specified in **Pt 7, Ch 5, 701. 1 of the Guidance** is provided onboard. |
| | Reliquefaction | to ships carrying liquefied gas in bulk where the **Reliquefaction** Plant of cargo vapour specified in **Pt 7, Ch 5, 703. 2 of the Guidance** is provided onboard. |
| | DFDE (LNG, LPG) | to ships carrying liquefied gas in bulk where the **D**ual-**F**uel **D**iesel **E**ngine specified in **Pt 7, Ch 5, 1607.** or **Annex 7A-5 207. 4 of the Guidance** is provided onboard. |
| | Drilling System | to ships where the Drilling System specified in **Annex 1 of the Rules for the Classification of Mobile Offshore Drilling Units** is provided onboard. |
| | Battery-M, Battery-A | to ships where the battery system with a capacity of 50 kWh or more specified in **Guidance for Battery Systems on Board of Ships** are provided onboard.<br>(**M** : Main, **A** : Additional) |
| | LNG Bunker | to ships where LNG bunkering systems specified in **Pt 7, Ch 5, Annex 7A-3** of the Guidance are provided onboard. |
| | VRS | to ships where arrangements for handling excess vapor specified in **Pt 7, Ch 5, Annex 7A-3 203. 2** of the Guidance and **Ch 1, 102. 2 of Guidelines for Floating LNG Bunkering Terminal** are provided onboard.<br>(**V**apour **R**ecovery **S**ystem) |
| | Smart(INFRA)<br>Smart(SHM)<br>Smart(MHM)<br>Smart(EEM)<br>Smart(NAV)<br>*(2023)* | to ships equipped with infrastructure and smart system functions specified in the **Guidance for Smart Systems**<br>(**INFRA**structure)<br>(**S**tructural **H**ealth **M**onitoring)<br>(**M**achinery **H**ealth **M**onitoring)<br>(**E**nergy **E**fficiency **M**anagement)<br>(**I**ntelligent **NAV**igation) |

# Annex 1-2 Guidance for Intact Stability - 〈Void〉 *(2020)*

# Annex 1-3 Example of the Survey Programme and the Survey Planning Questionnaire

**1.** The following process may be considered to assist in identifying critical structural areas, nomination suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage in conjunction with the preparation of the survey programme, the example is shown in **Table 1.**

(Use may be made of the IACS UR Z10's Annex I, if it necessary)




**2.** Prior to the development of the survey programme, the survey planning questionnaire is to be completed by the Owner based on the information set out in **Annex 1-3, Table 2** of the Guidance, and forwarded to the Society.

Table 1 Example of the Survey Programme

# SURVEY PROGRAMME

For Special Survey No. / Intermediate Survey at years of age,
scheduled from to
at .
(If the commencement-completion survey system is applied, outlines of each survey are to be listed in the next page)

## Basic information and particulars

| |
|---|
| Name of ship : |
| Class No. : IMO No. : |
| Class Notation : |
| Flag State : |
| Port of registry : |
| Gross tonnage : |
| Deadweight(metric tones) : |
| Length between perpendiculars(m) : |
| Shipbuilder : |
| Hull number : |
| Date of delivery of the ship : |
| Date of build / major conversion : / |
| Owner : |
| Thickness measurement firm *(2019)* : |

Prepared by the Owner in co-operation with the Society;

| Owner's representative : | Classification Society : |
|---|---|
| Signature<br>Name<br>( Place / Date ) | Signature<br>Name<br>( Place / Date ) |

SURVEY PROGRAMME

## Outlines of each commencement-completion survey

| Date | Place | Docking (Yes/No) | Overall Survey | Close-up Survey | Thickness measurement | Tank Testing | Suspect Area |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

# 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/tanks, ballast tanks, including fore and aft peak tanks, required by the Rules.

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

1.2 Documentation

All documents used in the development of the survey programme are to be available onboard during the survey as required by the relevant requirements specified in the Rules.

SURVEY PROGRAMME

## 2. Arrangement of cargo holds, tanks and spaces

This section of the survey programme is to 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.

SURVEY PROGRAMME

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

This section of the survey programme is to indicate any changes relating to (and is to update) the information on the use of the holds and tanks of the ship, the extent of coatings and the corrosion prevention system provided in the survey planning questionnaire.

SURVEY PROGRAMME

## 4. Conditions for survey

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

| Hold/Tank/Space | Cleaning | Gas freeing | Ventilation | Lighting | Etc. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

SURVEY PROGRAMME

## 5. Provisions and method of access to structures

This section of the survey programme is to indicate any changes relating to (and is to update) the information on the provisions and methods of access to structures provided in the survey planning questionnaire.

SURVEY PROGRAMME

## 6. List of equipment for survey

This section of the survey programme is to identify and list the equipment that will be made available for carrying out the survey and the required thickness measurements.
(e.g. thickness measurement equipment, fracture detection equipment, explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook, whistles, safe lighting, protective clothing(safety helmet, gloves, safety shoes, etc.), etc.)

| Equipment | Sets | Description | Used for |
|---|---|---|---|
| | | | |
| | | | |

SURVEY PROGRAMME

# 7. Survey requirements

## 7.1 Overall Survey *(2022)*

This section of the survey programme is to identify and list the spaces that are to undergo an Overall Survey for the ship in accordance with the Rules.

| Hold/Tank/Space | Remarks | Extent of Joint Survey |
|---|---|---|
| | | |
| | | |

SURVEY PROGRAMME

## 7.2 Close-up Survey *(2022)*

This section of the survey programme is to identify and list the hull structures that are to undergo a Close-up Survey for the ship in accordance with the Rules.

| Hold/Tank/Space | Areas for Close-up Survey | Extent of Joint Survey |
|---|---|---|
| | | |
| | | |

SURVEY PROGRAMME

## 8. Identification of tanks for tank testing and pipes for pipe testing

This section of the survey programme is to identify and list the cargo holds and tanks that are to undergo tank testing for the ship and the pipes that are to undergo pipe testing(for chemical tankers) in accordance with the Rules.

| Hold/Tank/Pipe | Remarks |
|---|---|
| | |
| | |

SURVEY PROGRAMME

## 9. Identification of areas and sections for thickness measurements

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

| Hold/Tank | Areas and sections for thickness measurement |
|---|---|
| | |
| | |

SURVEY PROGRAMME

## 10. Minimum thickness of hull structures

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

(a) ☐ Determined from the attached wastage allowance table and the original thickness to the hull structure plans of the ship;

(b) ☐ Given in the following table(s):

| Area or location | Original as-built thickness(mm) | Minimum thickness(mm) | Substantial corrosion thickness(mm) |
|---|---|---|---|
| | | | |
| | | | |

Note: The wastage allowance tables are to be attached to the survey programme.

For vessels built under IACS Common Structural Rules(Pt 11, Pt 12 or Pt 13), the renewal thickness of the hull structure elements is indicated in the appropriate drawings.

SURVEY PROGRAMME

## 11. Thickness measurement firm *(2019)*

This section of the survey programme is to identify changes, if any, relating to the information on the thickness measurement firm provided in the survey planning questionnaire.

SURVEY PROGRAMME

## 12. Damage experience related to the ship

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

Hull damages sorted by location for the ship

| Cargo hold, 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

| Cargo hold, tank or space number or area | Possible cause, if known | Description of the damages | Location | Repair | Date of repair |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

SURVEY PROGRAMME

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

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

| Hold/Tank/Space | Areas of substantial corrosion | Date and kind of survey |
|---|---|---|
| | | |
| | | |

SURVEY PROGRAMME

## 14. Critical structural areas and suspect areas

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

| Hold/Tank/Space | Critical structural areas | Suspect areas |
|---|---|---|
| | | |
| | | |

SURVEY PROGRAMME

## 15. Other relevant comments and information

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

SURVEY PROGRAMME

## 16. Appendices

### Appendix 1 - List of plans

The Rules require that main structural plans of cargo holds/tanks and ballast tanks (scantling drawings), including information regarding use of high tensile steel (HTS), clad steel and stainless steel(for chemical tankers) are to be available. This appendix of the survey programme is to 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, is to be appended to the survey programme.

### Appendix 3 - Other documentation

This part of the survey programme is to identify and list any other documentation that forms part of the plan.

Table 2 Example of the Survey Planning Questionnaire

# SURVEY PLANNING QUESTIONNAIRE

The following information will enable the Owner in co-operation with the Society 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, is to provide all information and material required by the Rules.

## Basic information and particulars *(2019)*

| | |
|---|---|
| Name of ship : | |
| Class No. : | IMO No. : |
| Class Notation : | |
| Flag State : | |
| Port of registry : | |
| Gross tonnage : | |
| Deadweight(metric tones) : | |
| Length between perpendiculars(m) : | |
| Shipbuilder : | |
| Hull number : | |
| Date of delivery of the ship : | |
| Date of build / major conversion : | / |
| Owner : | |
| Thickness measurement firm : | |

| |
|---|
| Owner's representative : |
| Signature<br>_____<br>Name<br>( Place / Date ) |

SURVEY PLANNING QUESTIONNAIRE

## 1. Information on access provisions for Close-up Surveys and thickness measurement

The Owner is to 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. normally within reach of hand.

| Hold/Tank / Space | Structure* | C(Cargo)/ B(Ballast) | Access provisions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Permanent Means of Access | Temporary staging | Rafts/Boats | Ladders | Direct access | Other means (please specify) |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

* Each structural components which have different type of access provisions are to be specified. (e.g. Fore peak/Aft peak/Under deck/Side shell/Bottom transverse/Longitudinal/Transverse/Hatch side coamings/Topside slopping plate/Upper stool plating/Cross deck/Side shell, frames & brackets/Transverse bulkhead/Hopper slopping plating/Lower stool/Tank top/Double bottom structure/Upper stool internal structure/Lower stool internal structure, etc.)

History of bulk cargoes of a corrosive nature(e.g. high sulphur content) /
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 for MARPOL Annex I cargoes and marine fuel oils.

SURVEY PLANNING QUESTIONNAIRE

## 2. Owner's inspections

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

| Hold/Tank/Space | Use | Corrosion prevention system (1) | Coating extent (2) | Coating condition (3) | Structural deterioration (4) | Hold/tank/space history (5) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

(1) HC=hard coating, SC=soft coating, SH=semi-hard coating, NP=no prevention
(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 is to be attached to the questionnaire)

Owner's representative :

Signature

Name
( Place / Date )

SURVEY PLANNING QUESTIONNAIRE

## 3. Reports of Port State Control inspections

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

## 4. Safety Management System

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

## 5. Name and address of the approved thickness measurement firm *(2019)*

| Name | Address | Approved by |
|---|---|---|
| | | |
| | | |

# Annex 1-4 Owners Inspection Report

The Owner of ships subject to the enhanced survey programme such as bulk carriers, oil tankers and chemical tankers, etc. is to complete the Owner Inspection Report and retain it inside the ship, according to requirement **Ch 3, 103.** of the Rules. An example of the Owner Inspection Report is shown in **Table 1.**

**Table 1 Example of Owner Inspection Report**

Owners Inspection Report(Structural Condition)

◦ Ship's Name :_____ ◦ Tank No./Hold No. : _____

◦ Grade of Steel :

· Deck :_____ · Side : _____

· Bottom :_____ · Longi. BHD : _____

· Trans. BHD :_____

| Elements | Cracks | Buckling | Corrosion | Coating Cond. | Pitting | Rep., Mod | Other |
|---|---|---|---|---|---|---|---|
| Deck | | | | | | | |
| Bottom | | | | | | | |
| Side | | | | | | | |
| Longi. BHD | | | | | | | |
| Trans BHD | | | | | | | |

◦ Repairs carried out due to :

◦ Thickness measurements carried out :
· Date :
· Result in General :

◦ Overdue Survey :

◦ Outstanding Conditions of Class :

◦ Comments :

* Repairs are to be surveyed by the Society *(2024)*

◦ Date of Inspection : _____

◦ Inspected by : _____

◦ Signature : _____

# Annex 1-5 Thickness Measurement Method for Hull Structural Members *(2024)*

## 1. General

(1) Purpose of thickness measurement *(2022)*

(A) Corrosion seems to be one of the common denominators in many cases of serious hull casualties resulting in losses of vessels, cargoes and human lives.

The purpose of thickness measurement is to prevent vessels from hull casualties.
Information provided in the report of hull thickness measurements for a vessel put in service indicates that the vessel is maintaining sufficient local and global strength, if necessary renewal/repair works can be made accordingly.

Therefore, thickness measurement reports giving information for the assessment of hull strength as well as for the maintenance of the hull is to be carefully considered. *(2024)*

(2) Extent of thickness measurement

The standard extent of thickness measurements complying with the "Rules for Classification of Steel Ships" is given in **Table 4** to **Table 13.** However, the extent of thickness measurements may be specially considered by the Society, considering the coating and corrosion condition.

(3) Thickness measurement report *(2024)*

(A) Thickness measurement reports are to be recorded in the following form and submitted.

(a) General particulars as shown in **Table 19**; and

(b) In case of non-CSR ships, measuring position, diagram with details of the position to be measured, original thickness, maximum allowable diminution and present thickness (gauged) and diminution, etc. Reporting form shown in **Table 20-1**(or equivalent form).

(c) In case of ships built in accordance with the IACS Common Structural Rules (**Pt 11, Pt 12** or **Pt 13** of the Rules), measuring position, diagram with details of the position to be measured, as builted thickness, voluntary thickness addition, renewal thickness, present thickness(gauged) and remaining corrosion addition, etc. Reporting form shown in **Table 20-2**(or equivalent form).

## 2. Wear Limit

(1) General

(A) This annex provides standard of wear limit for decision of repair of main hull structural members or hull equipment. Wear limit or allowable wear quantity means allowable wear limit.

(B) When worn down thickness of hull structural members exceed the wear limit, inspections are to be carried out in detail and corresponding hull structural members are to be renewed by the date recommended by the Surveyor.

If the thickness measurement results of structural members or fittings exceed the wear limit, the processing procedure is to comply with **Ch 2, 109**. of the Rules.

(C) Wear limit on hull structural members not provided by this annex follows what is deemed appropriate by the Surveyor.

(2) Wear limit on hull structural members

(A) Wear limits on structural members are provided in **Table 1.** However, for vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**), **Ch 3, 105. 2** of the Rules is to be applied.

(B) Value of wear limit indicates the limit on equally distributed wearing.

(C) When partial corrosion occurs in stress concentrated part, partial replacement or reinforcement shall be carried out without reference to **Table 1.**

**Table 1 Wear limit on members**

<table>
<tr><td rowspan="7">Local Wear Limit</td><td rowspan="2">Name of member</td><td colspan="3">Wear limit</td></tr>
<tr><td>Class I [1]</td><td>Class II [1]</td><td>Class III [1]</td></tr>
<tr><td>Strength deck plating, sheer strake and longitudinals to these members,<br>shell plating, bottom shell plating,<br>bulkhead plating of deep tank[3],<br>topside sloping plating,<br>hopper side sloping plating,<br>inner bottom plating (2025)</td><td>20 % of original thickness[4] (2025)</td><td>(20 % of original thickness) + 1 mm</td><td rowspan="5">1 mm</td></tr>
<tr><td>Floor & girder of double bottom,<br>web and face of primary supporting member</td><td>20 % of original thickness</td><td>25 % of original thickness</td></tr>
<tr><td>Effective deck[5] plating,<br>superstructure deck plating,<br>deck plating inside the line of cargo hatch openings,<br>watertight bulkhead plating other than bulkhead plating of deep tank,<br>hatch cover(including stiffeners),<br>hatch coaming(including stiffeners),<br>web, face and brackets of secondary stiffener[6] (2025)</td><td>25 % of original thickness</td><td>30 % of original thickness</td></tr>
<tr><td>Web, face and brackets of frames in cargo hold/tank</td><td>20 % of original thickness or 1.5 mm, whichever greater</td><td>25 % of original thickness or 2.5 mm, whichever greater</td></tr>
<tr><td>Partial corrosion (e.g pitting)</td><td>30 % of original thickness</td><td>35 % of original thickness</td></tr>
<tr><td colspan="4">(NOTES)<br>1) For ships classed through the Classification Survey during Construction : the Class I, II and III are as follow.<br>(a) Class I : It is applied to ships having one or two of the following characteristics.<br>(i) Ships, with of length of 90 m and above, which are classed with Classification Survey during Construction in accordance with the Rules after 1st July 1998.<br>(ii) Ships carry for liquid cargo, which are classed with Classification Survey during Construction in accordance with the Rules after 1st July 1998.<br>(b) Class II : Ships, other than in Class I and III.<br>(c) Class III : Ships constructed with steel, which is applied to the Rules for the Classification of High Speed and Light Crafts and the Guidance Relating to the Rules for the Classification of High Speed and Light Crafts.<br>2) For ships classed through the Classification Survey after Construction, the separate requirements specified by the Society are to be applied.<br>3) Definition of deep tank is specified in Pt 3, Ch 15, 101. of the Rules.<br>4) Definition of original thickness is the thickness on the drawing. However, if the thickness required by the rules is separately specified for each member, that is to be followed. (2025)<br>5) Definition of effective deck is specified in Pt 3, Ch 5, 103. of the Rules.<br>6) Secondary stiffener refers to the member which is supported by the primary supporting member and does not support another reinforcement member.</td></tr>
<tr><td>Wear relating to the Shearing Strength</td><td colspan="4">The shearing strength evaluation is to be carried out in any of the following cases when the thickness measurement for the longitudinal strength evaluation is carried out in accordance with the separate requirements specified by the Society.<br>1) For oil tankers(including chemical tankers), the average corrosion of any stake in side shell or longitudinal bulkhead exceeds the followings,<br>Class I : 2.0 mm<br>Class II : 3.0 mm<br>2) For liquefied gas carriers, the average corrosion of any stake in side shell exceeds the followings, or<br>Class I : 1.5 mm<br>Class II : 2.5 mm<br>3) For bulk carriers(including ore carriers) intended for alternate loading, the average corrosion of any stake in side shell or longitudinal bulkhead exceeds the followings<br>Class I : 1.5 mm<br>Class II : 2.5 mm</td></tr>
</table>

(3) Wear limit of hold hatch cover of bulk carriers which are contracted for construction after 1st July 1998 and before 1st January 2004 and designed by the Rules **Pt 4, Ch 2** is to be determined in accordance with the following requirements.

(A) Single skin hatch covers and the pontoon hatch covers

(a) Steel renewal is required where the gauged thickness is worn more than 1.5 mm (less than $t_{net}+0.5$ mm). The net thickness $t_{net}$ is the thickness obtained by subtracting the corrosion addition from the required thickness.

(b) Where the gauged thickness is worn within the range 1.0 mm and 1.5 mm ($t_{net}+0.5$ mm and $t_{net}+1.0$ mm), coating applied in accordance with coating manufacturer's requirements or annual gauging may be adopted as an alterative to steel renewal.

(B) Internal structural members of pontoon hatch covers
Thickness gauging is required when plating renewal is to be carried out in accordance with previous (a) or when it is deemed necessary, at the discretion of the Society, on the basis of the plating corrosion or deformation condition. In these cases, steel renewal for the internal structures is required where the gauged thickness is worn more than 1.5 mm (less than $t_{net}$).

(4) Wear limit of hold hatch cover and hatch coatings of all bulk carriers, ore carriers and combination carriers which are contracted for construction on or after 1st January 2004 and before 1st July 2024 and designed by the Rules **Pt 7, Ch 3, Sec 9** is to be determined in accordance with the following requirements. *(2025)*

(A) Single skin hatch covers and double skin hatch covers

(a) Steel renewal is required where the gauged thickness is worn more than 1.5 mm (less than $t_{net}+0.5$ mm).

(b) Where the gauged thickness is worn within the range 1.0 mm and 1.5 mm ($t_{net}+0.5$ mm and $t_{net}+1.0$ mm), coating applied in accordance with coating manufacturer's requirements or annual gauging may be adopted as an alterative to steel renewal. Coating is to be maintained in GOOD condition, as defined in **Ch 2, 102.** "Coating Condition" of the Rules *(2024)*

(B) Internal structural members of double skin hatch covers
Thickness gauging is required when plating renewal is to be carried out in accordance with previous (a) or when it is deemed necessary, at the discretion of the Society, on the basis of the plating corrosion or deformation condition. In these cases, steel renewal for the internal structures is required where the gauged thickness is worn more than 1.5 mm (less than $t_{net}$).

(C) Hatch coamings

(a) Steel renewal is required where the gauged thickness is worn more than 1.0 mm (less than $t_{net}+0.5$ mm).

(b) Where the gauged thickness is worn within the range 0.5 mm and 1.0 mm ($t_{net}+0.5$ mm and $t_{net}+1.0$ mm), coating applied in accordance with coating manufacturer's requirements or annual gauging may be adopted as an alterative to steel renewal. Coating is to be maintained in GOOD condition, as defined in in **Ch 2, 102.** "Coating Condition" of the Rules *(2024)*

(5) The renewal thickness($t_{renewal}$) of steel hatch covers and coamings in position I and II on exposed decks, subjected to **Pt 4, Ch 2**, of ships other than bulk carriers which are keel laid on ore after 1st January 2005 and are contracted for construction before 1st July 2024 are to be in accordance with as followings. (Refer to **Pt 4, Ch 2, 107. 2**) *(2025)*

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

Where,

$t_{as-built}$ : as built thickness

$t_c$ : corrosion addition according to **Pt 4, Ch 2, 107. Table 4.2.1** of the Rules

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

following formula

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

(6) The renewal thickness($t_{renewal}$) of steel hatch covers and coamings in position I and II on exposed decks, subjected to **Pt 4, Ch 2,** of all ships except bulk carriers to which **Pt 13** are contracted for construction on or after 1st July 2024 are to be in accordance with as followings. (Refer to **Pt 4, Ch 2, 107. 2 & 3**) *(2025)*

(A) Renewal thickness

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

where,
$t_c$ : Corrosion addition according to **Table 2**
In case that corrosion addition $t_c$ is 1.0 mm, renewal thickness may be given by the following formula.

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

**Table 2 Corrosion additions $t_c$ for hatch covers and hatch coamings**

| Application | Structure | $t_c$ (mm) |
|---|---|---|
| Container ships, car carriers, paper carriers, passenger vessels | Hatch covers | 1.0 |
| | Hatch coamings | 1.5 |
| Type-2 ships | Single skin hatch covers | 2.0 |
| | Top plating and bottom plating of double skin hatch covers | 2.0 |
| | Internal structure of double skin hatch covers | 1.5 |
| | Hatch coamings and coaming stays | 1.5 |
| All other ship types | Single skin hatch covers | 2.0 |
| | Top plating and bottom plating of double skin hatch covers | 1.5 |
| | Internal structure of double skin hatch covers and closed box girders | 1.0 |
| | Hatch coaming parts including stays and stiffeners | 1.5 |

(B) Steel renewal
(a) The treatment in relation to gauged thickness are to be obtained from **Table 3.**

(b) Where applied protection coating, coating applied in accordance with the coating manufacturer's requirements. Coating is to be maintained in GOOD condition, as defined in **Pt 1, Ch 2, 102** of the Rules.

(c) For the internal structure of double skin hatch covers, thickness gauging is required when hatch cover top or bottom plating renewal is to be carried out or when this is deemed necessary, at the discretion of the Surveyor, on the basis of the plating corrosion or deformation condition. In these cases, steel renewal for the internal structures is required where the gauged thickness is less than $t_{net}$.

**Table 3 Treatment in relation to gauged thickness**

| Treatment | Where $t_c \geq 1.5\,mm$ | Where $t_c = 1.0\,mm$ |
|---|---|---|
| Steel renewal | $t_g < t_{net} + 0.5\ mm$ | $t_g \leq t_{net}$ |
| Apply protection coating or annual gauging | $t_{net} + 0.5 < t_g < t_{net} + 1.0\ mm$ | $t_{net} < t_g < t_{net} + 0.5\ mm$ |

(7) Wear limit of corrugated transverse watertight bulkheads for bulk carriers, which are contracted for construction after 1st July 1998 and designed by the Rules **Pt 7, Ch 3, 1201.** is to be determined in accordance with the following requirements.

(A) Steel renewal is required where the gauged thickness is worn more than 3.0 mm (less than $t_{net} + 0.5$ mm).

(B) Where the gauged thickness is worn within the range 2.5 mm and 3.0 mm ($t_{net} + 0.5$ mm and $t_{net} + 1.0$ mm), coating applied in accordance with coating manufacturer's requirements or annual gauging may be adopted as an alterative to steel renewal.

(8) Corrosion addition and steel renewal of vertically corrugated transverse watertight bulkheads between cargo holds No. 1 and 2 for bulk carriers, which are applied to **Pt 7, Annex 7-5, 1** (1) (A) of the Guidance, are to be determined in accordance with the requirements specified in **Pt 7, Annex 7-5, 1** (6).

(9) The wastage allowances of supporting hull structures associated with towing and mooring, subject to **Pt 4, Ch 10** of the Rules, of ships which are keel laid on or after 1st January 2007 are specified in **Pt 4, Ch 10, 204.** Corrosion addition and **205.** Wear allowance of the Rules. *(2024)*

## 3. Location of Thickness Measurement

(1) Thickness measurements for suspect area
The thickness gaugings may be required as a result of Close-up Survey in suspect areas(i.e., locations showing substantial corrosion and/or considered by the Surveyor to be prone to rapid wastage). Details are given in **Table 2.** *(2024)*

(2) Location and number of thickness measuring points
The standard location and number of thickness measuring points and patterns are shown in **Table 3.** These figures show typical arrangements of ships such as bulk carriers and oil tankers, etc. and these may be used as guidance for different type of ships other than those illustrated. The location and number of thickness measuring points for other hull structural members which are not specified in this Annex are to be in accordance with what considered appropriate by the Surveyor taking into account of the ship's age and hull structure, etc.

(3) Thickness Measurement at Special Survey
The standard extent of thickness measurements at each Special Survey are given in **Table 4** to **Table 13.**

## 4. Additional Thickness Measurement

The extent of additional thickness measurement at those areas of substantial corrosion of ships subject to the enhanced survey programme such as bulk carriers, oil tankers and chemical tankers, etc. is shown in **Table 14** to **Table 18.**

## 5. Sampling method of thickness measurements for longitudinal strength evaluation and repair methods for oil tankers or double hull oil tankers subject to the enhanced survey programme

(1) Extent of longitudinal strength evaluation
Longitudinal strength should be evaluated within 0.4 $L$ amidships for the extent of the hull girder length that contains tanks therein and within 0.5 $L$ amidships for adjacent tanks which may extent beyond 0.4 $L$ amidships, where tanks means ballast tanks and cargo tanks.

(2) Sampling method of thickness measurement

(A) Pursuant to the requirements of **Ch 3, 304. 4** or **504. 4** of the Rules as applicable, transverse sections should be chosen such that thickness measurements can be taken for as many different tanks in corrosive environments as possible, e.g. ballast tanks sharing a common plane boundary with cargo tanks fitted with heating coils, other ballast tanks, cargo tanks permitted to be filled with sea water and other cargo tanks. Ballast tanks sharing a common plane boundary with cargo tanks fitted with heating coils and cargo tanks permitted to be filled with sea water should be selected where present.

(B) The minimum number of transverse sections to be sampled should be in accordance with **Ch 3, Table 1.3.5** or **Table 1.3.11** of the Rules as applicable. The transverse sections should be located where the largest thickness reductions are suspected to occur or are revealed from deck and bottom plating measurements prescribed in (C) and should be clear of areas which have been locally renewed or reinforced.

(C) At least two points should be measured on each deck plate and/or bottom shell plate required to be measured within the cargo area in accordance with the requirements of **Ch 3, Table 1.3.5** or **Table 1.3.11** of the Rules as applicable.

(D) Within 0.1 $D$ (where $D$ is the ship's moulded depth) of the deck and bottom at each transverse section to be measured in accordance with the requirements of **Ch 3, Table 1.3.5** or **Table 1.3.11** of the Rules as applicable, every longitudinal and girder should be measured on the web and face plate, and every plate should be measured at one point between longitudinals.

(E) For longitudinal members other than those specified in (D) above to be measured at each transverse section in accordance with the requirements of **Ch 3, Table 1.3.5** or **Table 1.3.11** of the Rules as applicable, every longitudinal and girder should be measured on the web and face plate, and every plate should be measured at least in one point per strake.

(F) The thickness of each compartment should be determined by averaging all of the measurements taken in way of the transverse section on each compartment.

(3) Additional measurements where the longitudinal strength is deficient.

(A) Where one or more of the transverse sections are found to be deficient in respect of the longitudinal strength requirements, the number of transverse sections for thickness measurement should be increased such that each tank within the 0.5 $L$ amidships region has been sampled. Tank spaces that are partially within, but extend beyond, 0.5 $L$ region, should be sampled.

(B) Additional thickness measurements should also be performed on one transverse section forward and one aft of each repaired area to the extent necessary to ensure that the areas bordering the repaired section also comply with the requirements of the Rules.

(4) Effective repair methods

(A) The extent of renewal or reinforcement carried out to comply with the Rules should be in accordance with (B) below.

(B) The minimum continuous length of a renewed or reinforced structural member should be not less than twice the spacing of the primary members in way. In addition, the thickness diminution in way of the butt joint of each joining member forward and aft of the replaced member(plates, stiffeners, girder webs and flanges, etc.) should not be within the substantial corrosion range(75% of the allowable webs and flanges, etc.) should not be within the substantial corrosion range(75% of the allowable diminution associated with each particular member).

Where differences in thickness at the butt joint exceed 15% of the lower thickness, a transition taper should be provided.

(C) Alternative repair methods involving the fitting of straps or structural member modification should be subject to special consideration. In considering the fitting of straps, it should be limited to the following conditions:

(a) to restore and/or increase longitudinal strength;

(b) the thickness diminution of the deck or bottom plating to be reinforced should not be within the substantial corrosion range(75% of the allowable diminution associated with the deck plating):

(c) the alignment and arrangement, including the termination of the straps, is in accordance with the separate requirements specified by the Society;

(d) the straps are continuous over the entire 0.5 $L$ amidships length; and

(e) continuous fillet welding and full penetration welds are used at butt welding and, depending on the width of the strap, slot welds. The welding procedures applied should be acceptable to the Society.

(D) The existing structure adjacent to replacement areas and in conjunction with the fitted straps, etc. should be capable of withstanding the applied loads, taking into account the buckling resistance and the condition of welds between the longitudinal members and hull envelope plating.

**Table 2 Suspect areas on which attention is to be paid**

| Location | Measuring Points | |
|---|---|---|
| Deck and upper structures | Special attention is to be given on fore parts (forward of 0.5 $L$ amidships) of strength deck, areas with standing bilges and members with originally light scantlings in addition to the following: | |
| | F'cle, poop and deckhouse | Break bulkheads of superstructures, Lower parts of deckhouse walls, Pipe penetration areas, Areas with drain plugs, Deck platings of superstructures, Deck platings in way of bilgeways, deck scuppers, deck machinery (winches, windlasses etc.), fair-leaders and bollards etc. |
| | Deck platings inside line of hatch openings and inside superstructures and deckhouses | Deck platings inside line of openings between cargo hatchways, and of deck platings inside superstructures and deckhouses. |
| | Hatch coamings and coaming stays | Lower parts attached to upper deck, Parts around steam pipes. |
| | Bulwark platings and bulwark stays | Lower parts attached to upper deck,<br>End parts connected to superstructures and deckhouses, Platings around freeing ports. |
| | Winch foundation | Special attention is to be given to steam winch foundations |
| | Steel hatch covers | Steel pontoon covers (including cleats, etc.) |
| Shells | Wind and water strakes | Special attention is to be given to fore and after part outside of 0.5 $L$ amidships. |
| | Shell platings connected to end brackets | After removal of limber boards and cement chocks, Close-up Survey is required. |
| | Shells attached to hold frames | Special attention is to be given to groovings on shells. |
| | Shells around chain lockers | - |
| | Hard spotted shells | Special attention is to be given to shells (parts or positions) in ballast tanks |
| Internal members | Special attention is to be given to areas with high humidity, standing bilges and poorly ventilated spaces in addition to the following : | |
| | Joint parts between hold frames and frame brackets | After removal of limber board, those parts are to be examined (problem areas in aged ships) |
| | Intersections between transverse W/T Bulkhead and inner bottom | After removal of bottom ceilings, those parts are to be examined. |
| | Tank top platings of double bottom tanks and of deep tanks used as ballast tanks | - |
| | Fillet weld parts between hold frames and side shells | Special attention is to be paid to hold frames in intermittent welds. |
| | Bilge wells | Special attention si to be given to bilge wells in E/R and bilge wells with piping arrangements. |
| | Inner bottom platings under pillars | - |
| | Internal members around sea water pumps in E/R | - |
| | Sea chest boundaries in E/R | - |
| | Joint parts between shaft tunnel and inner bottom | Close-up Survey is required for aged ships |
| | Intersections between tweendeck frames or tweendeck bulkheads and lower deck | - |
| | Lower parts of collision BHD and bottom of chain lockers | - |
| | Intersections between panting/side stringers and frames, and end parts, slot areas in way of panting/side stringers | - |

**Table 2 Suspect areas on which attention is to be paid** (continued)

| Location | Measuring Points | |
|---|---|---|
| Inside of tanks | Special attention is to be paid to the combined tanks (ballast and fuel oil), prone to rapid wastage, in addition to the following: | |
| | All of ballast tanks in front of E/R boundaries | Close-up Survey is required for tank top, bottom and boundary platings of the tanks not forming their boundaries by full envelope (both shells and decks). And special attention is to be paid to connections between frames and brackets, and on docking brackets, lightening holes |
| | Double bottom ballast tanks, side ballast tanks, and shaft tunnels | Special attention is to be paid to inner bottom platings meeting bulkheads, edge platings reaching to tank side brackets, and on lightening holes/slots in way of girders and on bottom shells around striking pads below sounding pipes. |
| | Bulkheads facing a heated zone | Special attention is to be paid to bulkheads facing E/R space, or fuel oil tanks being heated. |
| | Bottom platings below sounding pipes | Special attention is to be paid to bilge tanks in E/R |
| | Chain lockers in fore peak tanks | Special attention is to be paid to bottom platings and side boundaries of chain lockers. |

**Table 3-1 Location and number of thickness measuring points - Non-CSR Ships**

**Table 3-1** is to be applied to vessels not built under IACS Common Structural Rules (**Pt 11**, **Pt 12** or **Pt 13**) (i.e. Non-CSR Ships)

| Items | Location and number of thickness measuring points |
|---|---|
| Transverse Section | 1. For oil tankers, chemical tankers or double hull oil tankers subject to the enhanced survey programme (See **Fig 1** and **Fig 2**)<br>(1) At each transverse section, every plate within 0.1D(where D is the ship's moulded depth) of the deck and bottom is to be measured at one point between longitudinals, and all the other plate is to be measured at least one point per strake.<br>(2) Where the thickness measurements for a transverse section are to include all longitudinal members, every longitudinal is to be measured at one point on the web and face plate.<br>2. For single skin bulk carriers, double skin bulk carriers or general dry cargo ships (See **Fig 3** and **Fig 4**)<br>(1) At each transverse section, every plate of the deck and inner bottom is to be measured at one point between longitudinals, and all the other plate is to be measured at least one point per strake.<br>(2) Where the thickness measurements for a transverse section are to include all longitudinal members, every longitudinal is to be measured at one point on the web and face plate.<br>3. For general ships other than **1** and **2** above (See **Fig 5**)<br>(1) At each transverse section, every plate is to be measured at least two points per strake.<br>(2) Where the thickness measurements for a transverse section are to include all longitudinal members, every longitudinal is to be measured at one point on the web and face plate.<br>4. For transversely framed vessels, a transverse section includes adjacent frames and their end connections in way of transverse sections.<br>(For oil tankers, chemical tankers or double hull oil tankers subject to the enhanced survey programme see **Fig 1** and **Fig 2**, for single skin or double skin bulk carriers see **Fig 6** and **Fig 8**, for other ships see **Fig 7**) |
| Transverse Section of deck, side shell and bottom plating | At least two points on each plate(either at each 1/4 extremity of plate or at representative areas of average corrosion) are to be measured in the transverse section concerned. |
| Selected plates:<br>Selected plates on deck(including deck inside line of hatch openings), tank top, bottom, inner bottom plates, etc. and wind-and-water strakes | At least two points are to be measured at representative areas of average corrosion. Where the length of the plate exceeds 6 m, two points per 6 m are to be gauged additionally. Where plates cross ballast/cargo tank boundaries separate measurements for the area of plating in way of each type of tank are to be taken. In case of side shell plating, one or two wind and water strakes are to be gauged according to No. of Special Survey. The gauging location of each plate may be selected by the attending Surveyor in consideration of the corrosion pattern. |
| All plates:<br>All deck(including deck inside line of hatch openings), tank top, bottom, inner bottom plates, etc. and wind-and-water strakes | At least two points on each plate(either at each 1/4 extremity of plate or at representative areas of average corrosion) are to be measured. Where the length of the plate exceeds 6 m, two points per 6 m are to be gauged additionally. Where plates cross ballast/cargo tank boundaries separate measurements for the area of plating in way of each type of tank are to be taken. |
| Selected internal structures:<br>Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, girders | The internal structural members to be measured in each space internally surveyed are to be<br>1. at least 10% outside the cargo (length) area,<br>2. at least 20% within the cargo (length) area.<br>(For oil tankers, chemical tankers or double hull oil tankers subject to the enhanced survey programme see **Fig 1** and **Fig 2**, for single skin or double skin bulk carriers see **Fig 6**, for other ships see **Fig 7**) |

**Table 3-1 Location and number of thickness measuring points - Non-CSR Ships** (continued)

| Items | Location and number of thickness measuring points |
|---|---|
| Selected side shell frames in cargo holds for single skin bulk carriers or general dry cargo ships | 1. Include side shell frame, upper and lower end attachments and adjacent shell plating.<br>2. 25% of frames: one out of four frames should preferably be chosen throughout the cargo hold length on each side.<br>3. 50% of frames: one out of two frames should preferably be chosen throughout the cargo hold length on each side.<br>4. "Selected frames" means at least 3 frames on each side of cargo holds.<br>(For single skin bulk carriers see **Fig 6**, for general dry cargo ships see **Fig 7**) |
| Transverse webs in ballast tanks for single skin bulk carriers, double skin bulk carriers or general dry cargo ships | One of the representative tanks of each type (i.e. topside or hopper or side tank) is to be chosen in the forward part.<br>(For single skin or double skin bulk carriers see **Fig 6**, for general dry cargo ships see **Fig 7**) |
| Transverse frames in double skin tanks for double skin bulk carriers | 25% of transverse frames: one out of four transverse frames is to be chosen preferably throughout the double skin tank length. (See **Fig 8**) |
| Transverse bulkheads | 1. For oil tankers, chemical tankers or double hull oil tankers subject to the enhanced survey programme: See **Fig 1** and **Fig 2**<br>2. For single skin bulk carriers, double skin bulk carriers or general dry cargo ships (See **Fig 9** to **Fig 11**)<br>(1) Transverse bulkheads in cargo holds<br>- Includes bulkheads plating, stiffeners and girders, including internal structure of upper and lower stools, where fitted.<br>- Two selected bulkheads : one is to be the bulkhead between the two foremost cargo holds and the second may be chosen in other positions<br>(2) One transverse bulkhead in each cargo hold<br>- The Close-up Survey and related thickness measurements are to be carried out on one side of the bulkhead; the side is to be chosen based on the outcome of the Overall Survey of both sides. In the event of doubt, the Surveyor may also require (possibly partial) Close-up Survey and related thickness measurements on the other side.<br>(3) Transverse bulkheads in one ballast tank<br>- The ballast tank is to be chosen based on the history of ballasting among those prone to have the most severe conditions. |
| Cargo hold hatch covers and coamings | See **Fig 12** |
| All under deck structure inside line of hatch openings between cargo hold hatches | At each short longitudinal girder: three points for web plating(fwd/middle/aft), single point for face plate, one point for web plating and one point for face plating of transverse beam in way. At each ends of transverse beams, one point for web plating and one point for face plating.<br>(See **Fig 13**) |
| (NOTES)<br>1. ⬭ mark : means the location to be measured.<br>2. ×, V mark : means the point to be measured. | |

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)

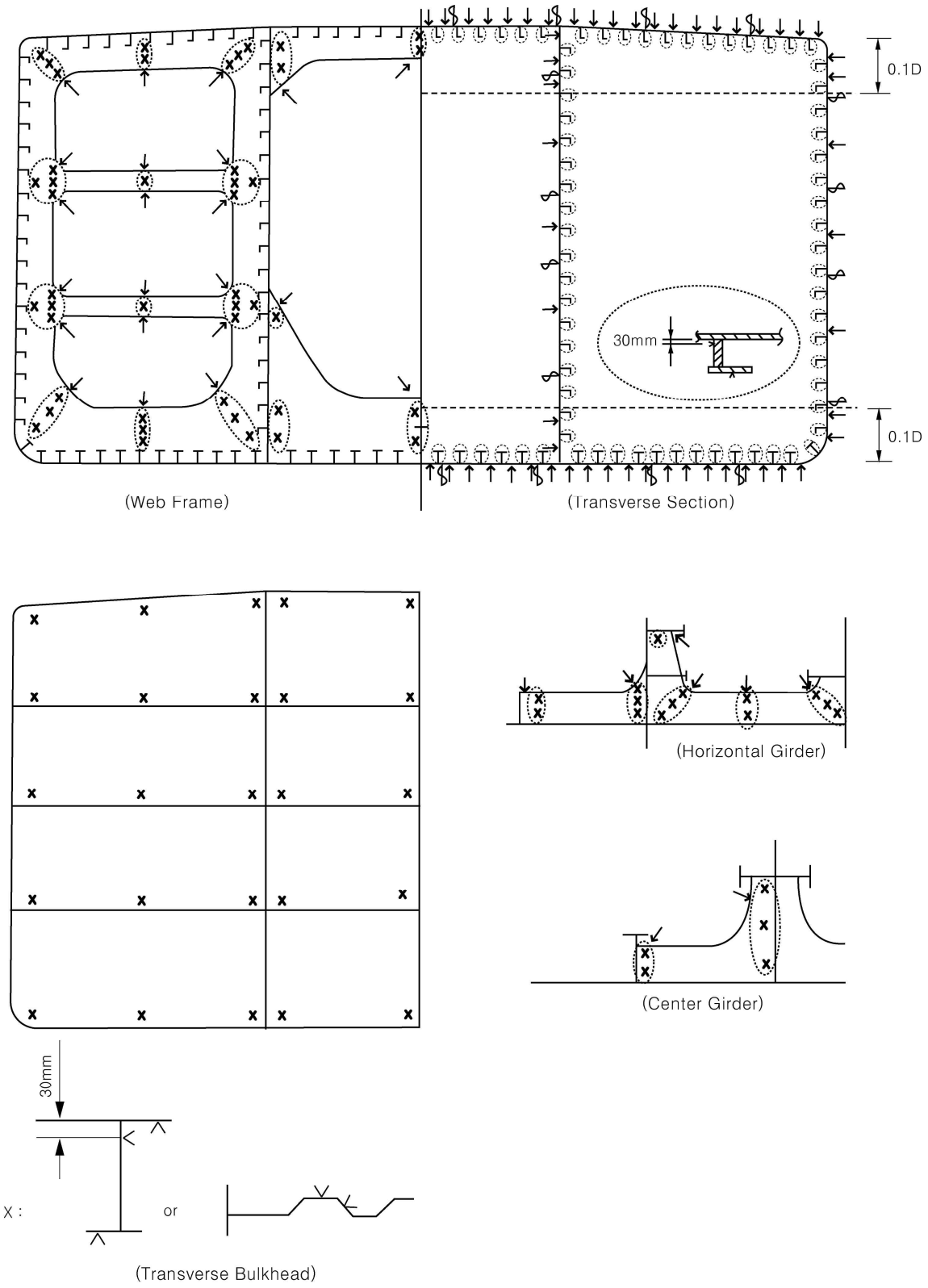



Fig 1 Locations of measurements of oil tankers and chemical tankers

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)

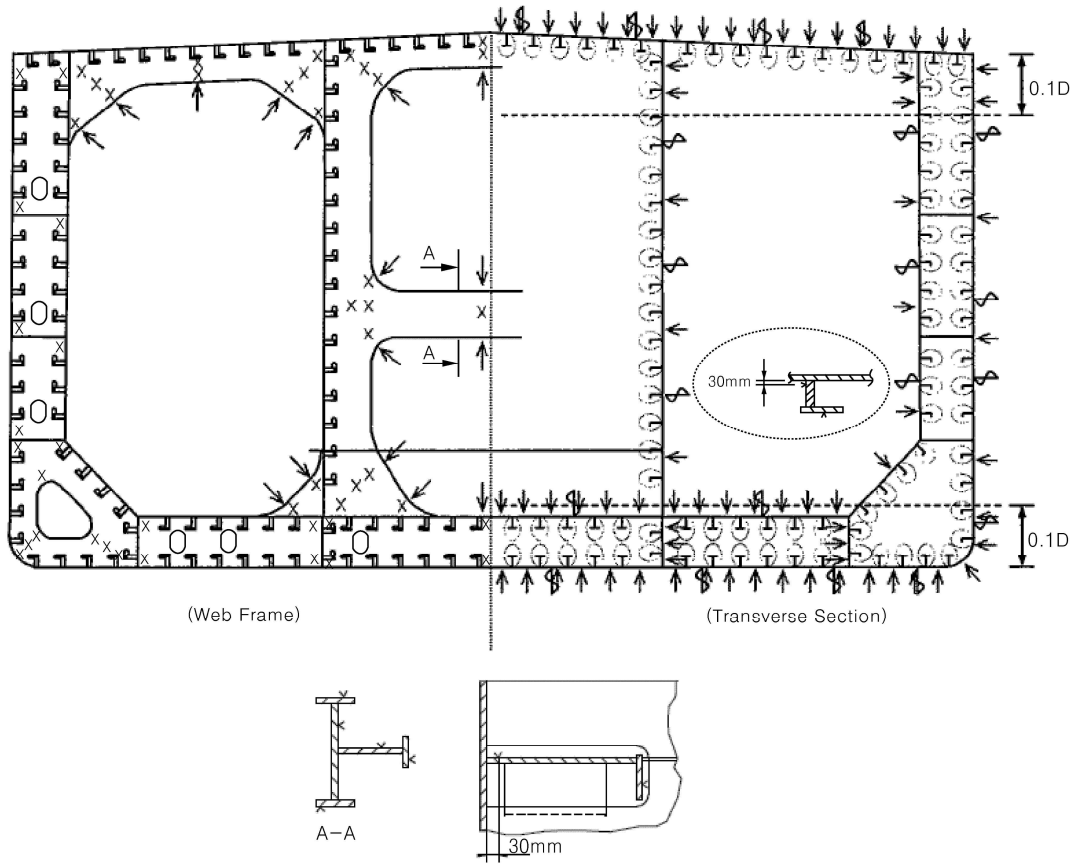



Fig 2 Locations of measurements of double hull oil tankers

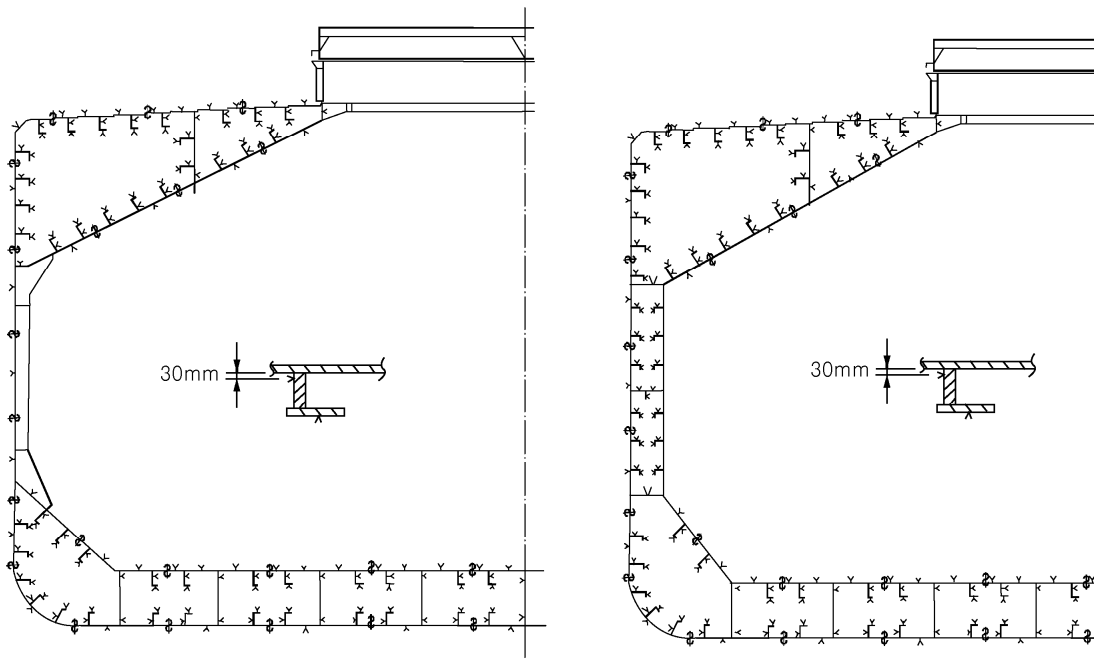



Fig 3 Locations of measurements on transverse section of single skin or double skin bulk carrie

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)

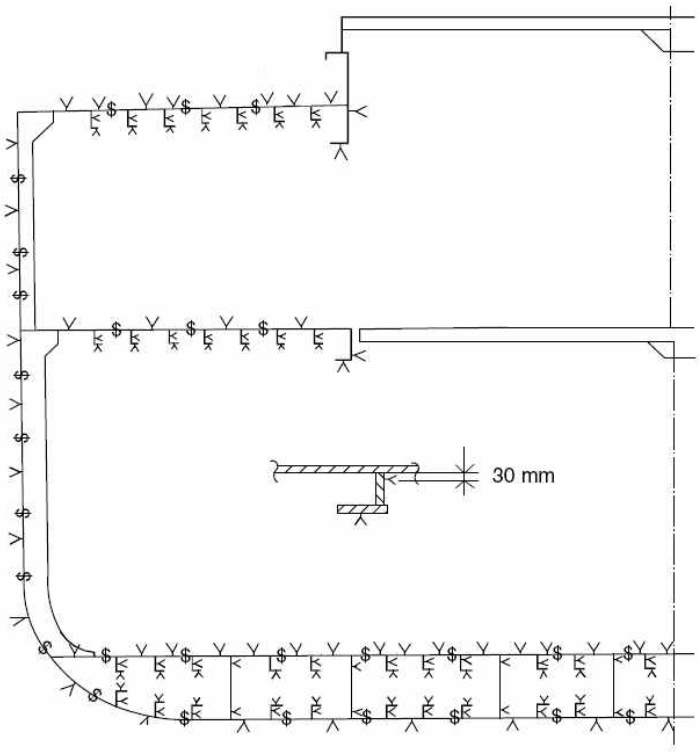
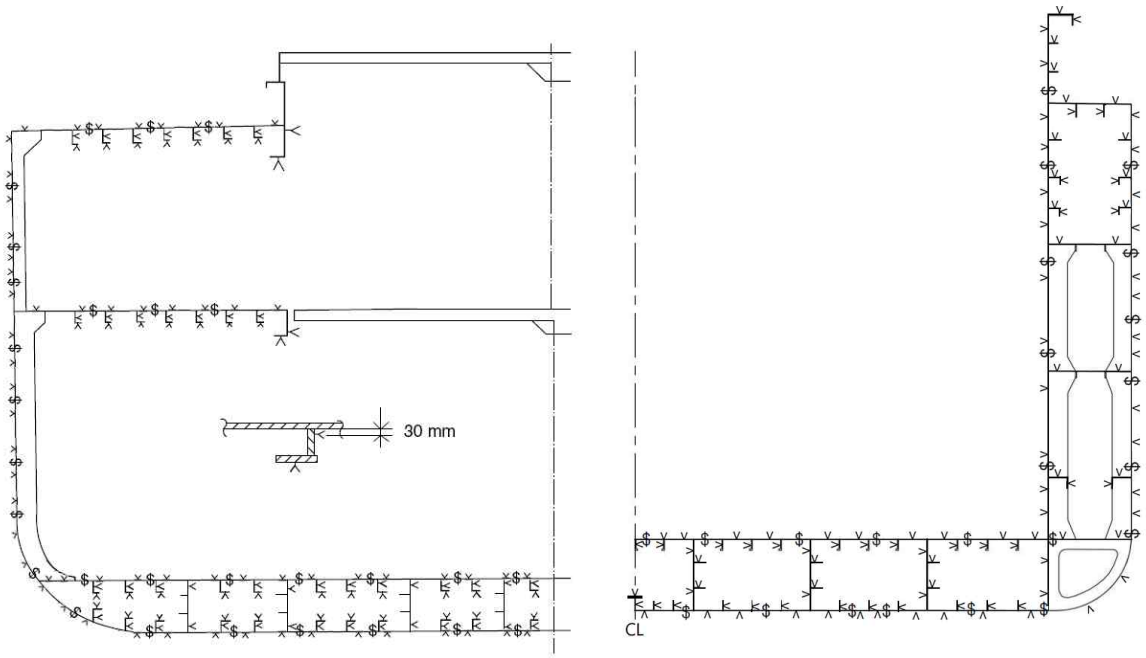


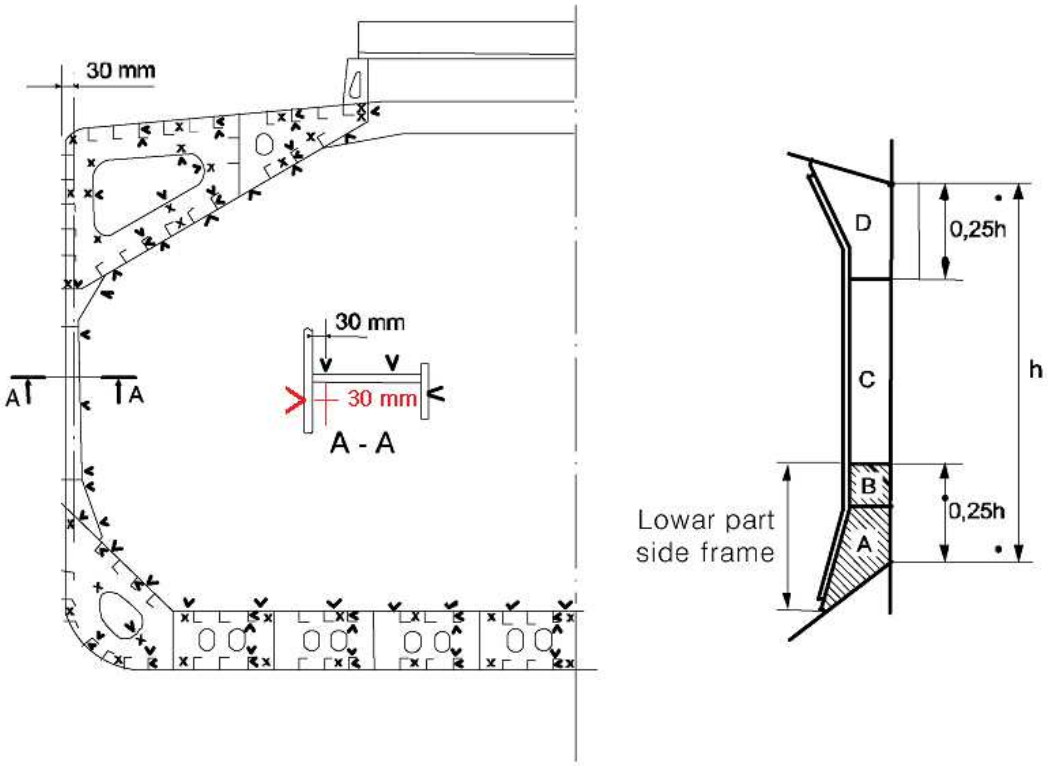

Fig 4 Locations of measurements on transverse section of general dry cargo ships



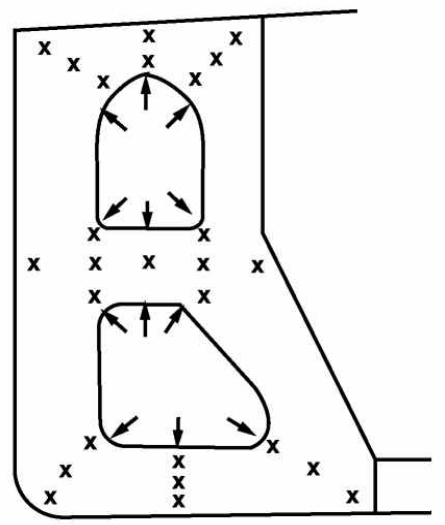

(Notes) It may also apply to other type of transverse section. In addition, where hatch coamings are included in the longitudinal strength member, such as a container ship, the right-hand transverse section is to be applied.

Fig 5 Locations of measurements on transverse section of general ships *(2024)*

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)




(Bulk Carriers)

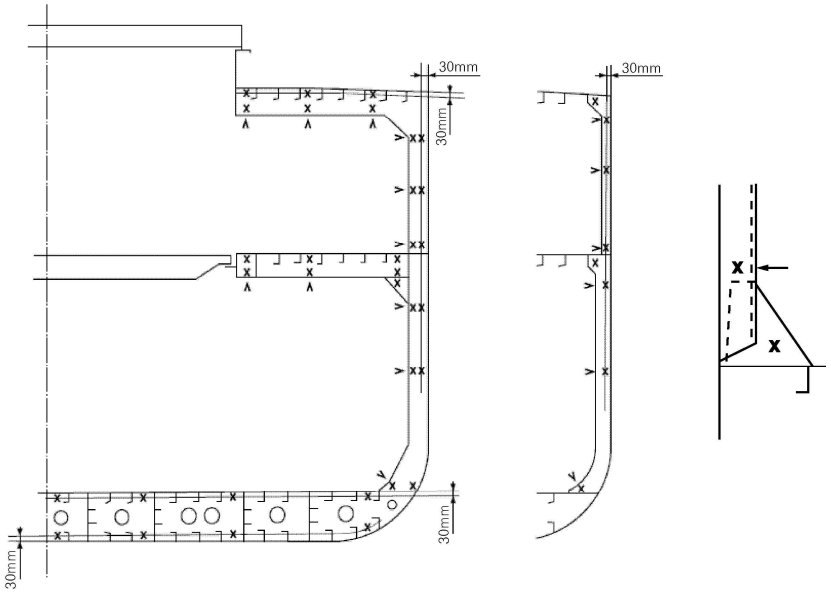


(Ore Carriers)

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

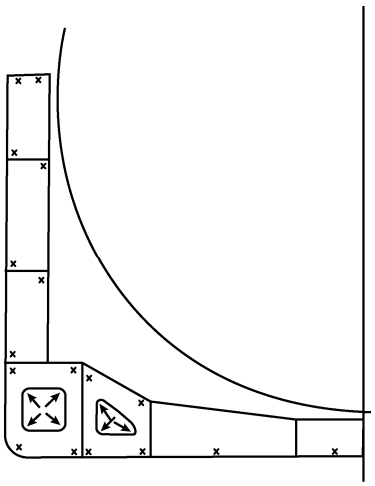
Fig 6 Locations of measurements on structural members in cargo holds and ballast tanks of single skin or double skin bulk carriers

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)




(General Dry Cargo Ships)

(Notes) It may also apply to other ship types.



(Liquified Gas Carriers)

Fig 7 Locations of measurements on selected internal structural members

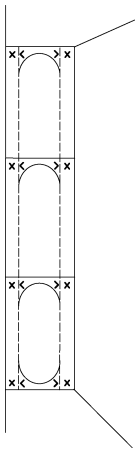
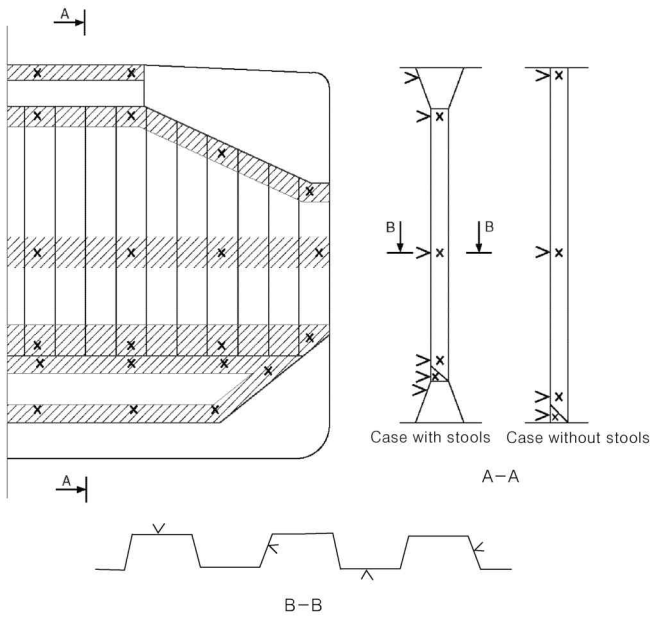
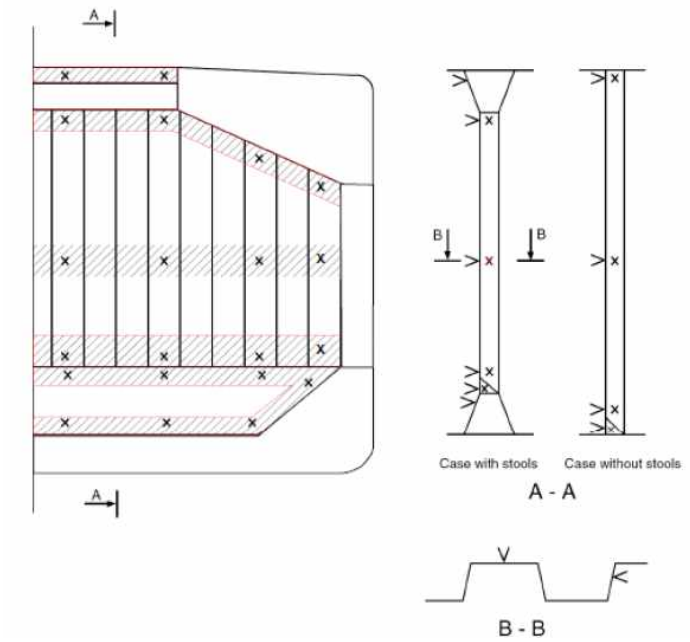


Fig 8 Locations of measurements on transverse frame in double skin tank of double skin bulk carriers

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)




Single skin bulk carriers

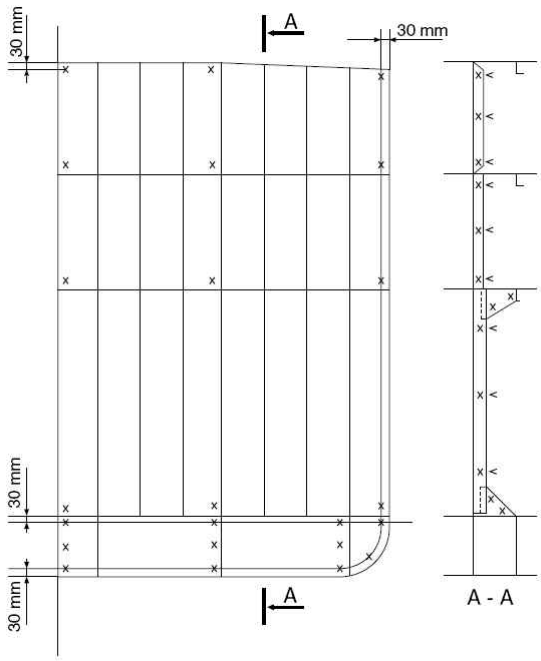



Double skin bulk carriers

(Notes) Measurements to be taken in each shaded area as per views A-A and B-B.
Additional measurements to internal structure of upper and lower stools to be added, e.g. two points in the upper and two points in the lower stools to be indicated in section A-A.

Fig 9 Locations of measurements on cargo hold transverse bulkheads of single skin or double skin bulk carriers

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)

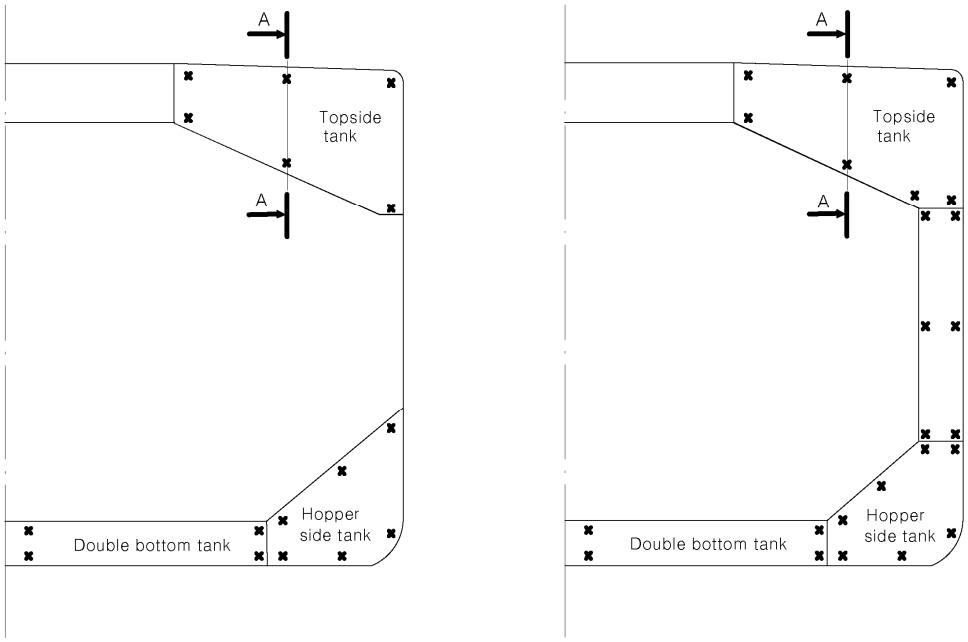


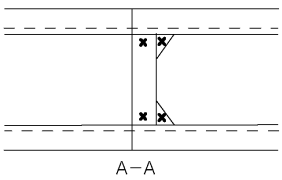

(Notes)

1. Cargo hold bulkhead/watertight floor plating to be measured as per main view.
2. One stiffener out of three to be measured as per view A-A.
3. It may also apply to other ship types.

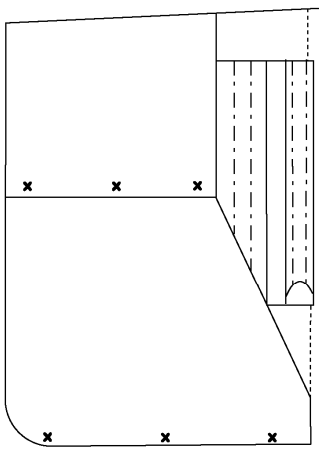
Fig 10 Locations of measurements on transverse bulkheads of general dry cargo ships

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)




(Bulk Carriers)

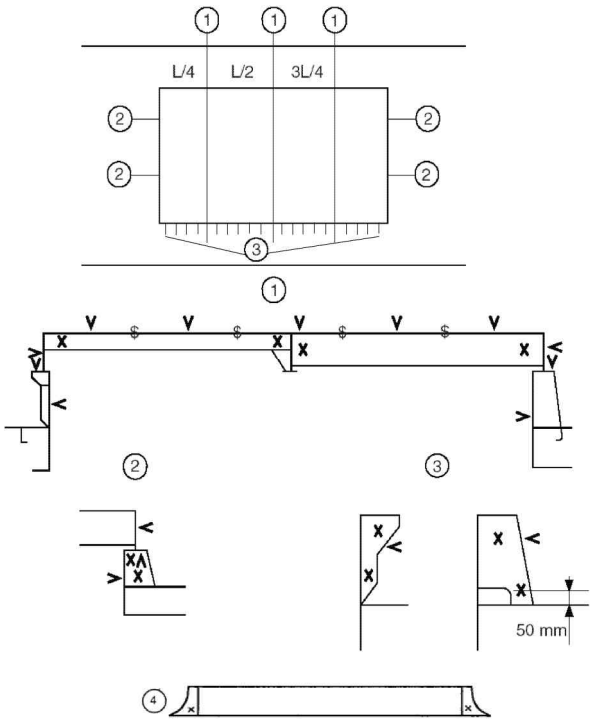


(Ore Carriers)

(Notes) Measurements to be taken in each vertical section as per view A-A.

Fig 11 Locations of measurements on transverse bulkheads in topside, hopper, double hull and double bottom ballast tanks of single skin or double skin bulk carriers

Table 3-1 Location and number of thickness measuring points - Non-CSR Ships (continued)




(Notes)

① For each hatch covers, three sections at L/4, L/2 and 3L/4 of hatch cover length, including:

- one measurement of each hatch cover plate and skirt plate
- measurements of adjacent beams or girder(including stiffeners)
- one measurement of coaming plates and coaming flange, each side

② For each hatch covers, one measurement of hatch cover skirt plate, coaming plate and coaming flange on both ends

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

④ One measurement of each hatch coaming end bracket

Fig 12 Locations of measurements on hatch covers and coamings

Table 3–1 Location and number of thickness measuring points – Non-CSR Ships (continued)

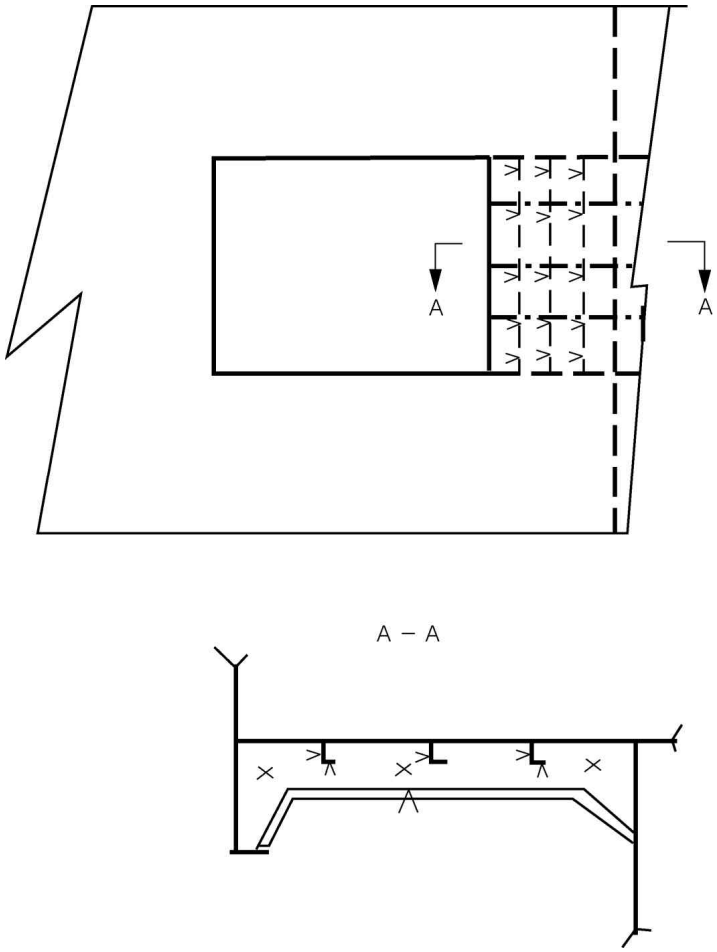



Fig 13 Locations of measurements on underdeck structure

**Table 3-2 Location and number of thickness measuring points - CSR Ships**

**Table 3-2** is to be applied to vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**) (i.e. CSR Ships).

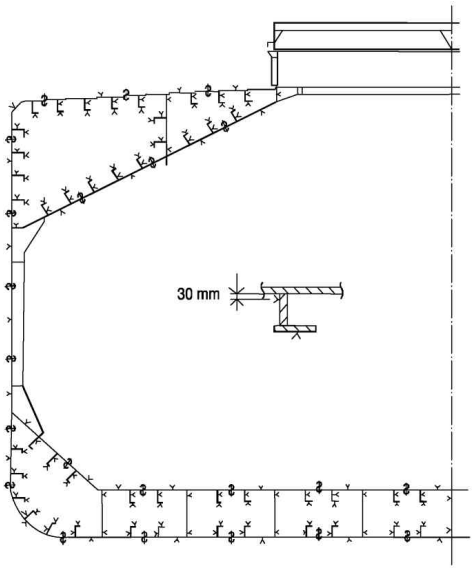
1) CSR bulk carriers

| Items | location and number of thickness measuring points | Figure reference |
|---|---|---|
| Selected plates on deck, tank top, bottom, double bottom and wind-and-water area | "Selected" means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion | |
| All deck, tank top and bottom plates and wind-and-water strakes | At least two points on each plate to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion | |
| Transverse section | - For single skin bulk carriers :<br>A transverse section includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and hopper side plating, longitudinal bulkhead and bottom plating in top wing tanks.<br><br>- For double skin bulk carriers :<br>A transverse section includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and hopper sides, inner sides and top wing inner sides. | **Fig 1** |
| All cargo hold hatch covers and coamings | Including plates and stiffeners | Locations of points are given in **Fig 2** |
| Transverse section of deck plating outside line of cargo hatch openings | Two single points on each deck plate (to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion) between the ship sides and hatch coamings in the transverse section concerned | |
| All deck plating and under deck 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 plate or at representative areas of average corrosion.<br><br>"Underdeck structure": at each short longitudinal girder: three points for web plating(fwd/middle/aft), single point for face plate, one point for web plating and one point for face plating of transverse beam in way. At each ends of transverse beams, one point for web plating and one point for face plating. | Extent of areas is shown in **Annex 1-6, 1** (2) or (6) of the Guidance<br><br>Location of points are given in **Fig 6** |

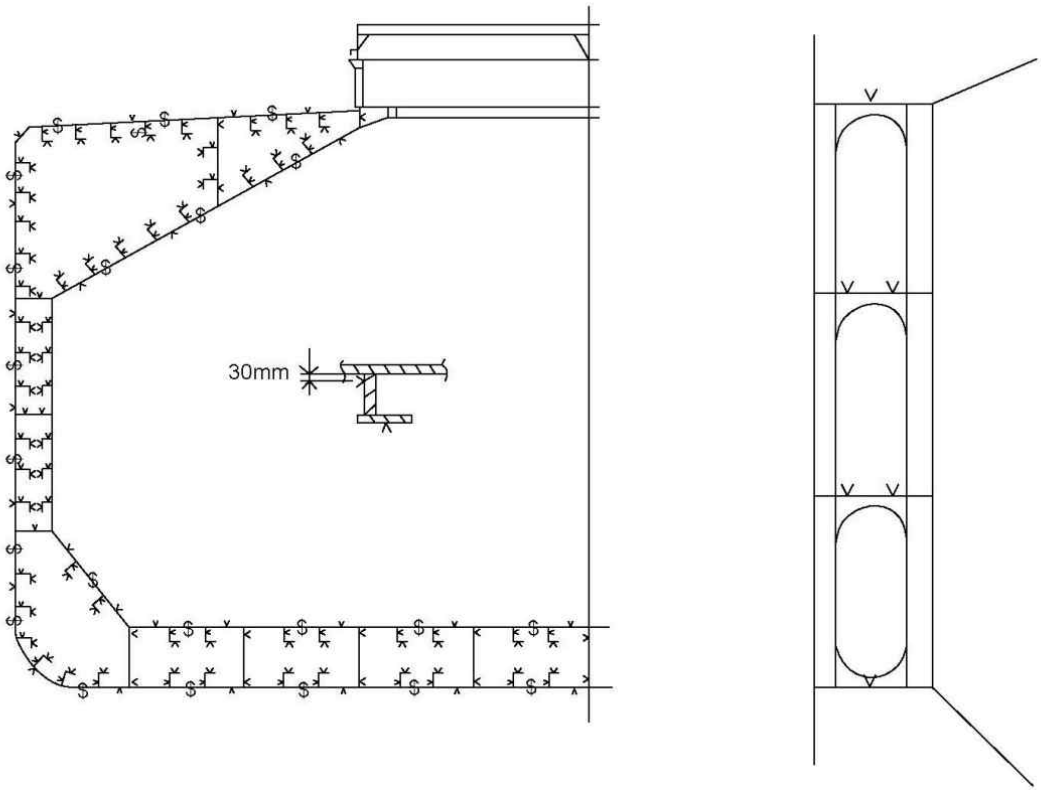
**Table 3-2 Location and number of thickness measuring points - CSR Ships** (continued)

| Items | location and number of thickness measuring points | Figure reference |
|---|---|---|
| Single skin bulk carriers: Selected side shell frames in cargo holds | Includes side shell frame, upper and lower end attachments and adjacent shell plating.<br><br>25% of frames: one out of four frames should preferably be chosen throughout the cargo hold length on each side.<br><br>50% of frames: one out of two frames should preferably be chosen throughout the cargo hold length on each side.<br><br>"Selected frames" means at least 3 frames on each side of cargo holds | Extent of areas is shown in **Annex 1-6, 1** (2) of the Guidance *(2019)*<br><br>Locations of points are given in **Fig 3** |
| Double skin bulk carriers: Transverse frame in double skin tank | | Extent of areas is shown in **Annex 1-6, 1** (6) of the Guidance *(2019)*<br><br>Locations of points are given in **Fig 3** |
| Transverse bulkheads in cargo holds | Includes bulkhead plating, stiffeners and girders, including internal structure of upper and lower stools, where fitted.<br><br>Two selected bulkheads: one is to be the bulkhead between the two foremost cargo holds and the second may be chosen in other positions | Areas of measurements are shown in **Annex 1-6, 1** (2) or (6) of the Guidance<br><br>Locations of points are given in **Fig 4** |
| One transverse bulkhead in each cargo hold | This means that the Close-up Survey and related thickness measurements are to be performed on one side of the bulkhead; the side is to be chosen based on the outcome of the overall survey of both sides. In the event of doubt, the Surveyor may also require (possibly partial) Close-up Survey and related thickness measurements on the other side | Areas of measurements are shown in **Annex 1-6, 1** (2) or (6) of the Guidance<br><br>Locations of points are given in **Fig 4** |
| Transverse bulkheads in one topside, hopper and double bottom ballast tank | Includes bulkhead and stiffening systems.<br><br>The ballast tank is to be chosen based on the history of ballasting among those prone to have the most severe conditions | Locations of points are given in **Fig 5** |
| Transverse webs in ballast tanks | Includes web plating, face plates, stiffeners and associated plating and longitudinals.<br><br>One of the representative tanks of each type (i.e. topside or hopper or side tank) is to be chosen in the forward part | Areas of measurements are shown in **Annex 1-6, 1** (2) or (6) of the Guidance<br><br>Locations of points are given in **Fig 3** |
| (NOTES)<br>1. ⬭ mark : means the location to be measured.<br>2. ×, V mark : means the point to be measured. | | |

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)



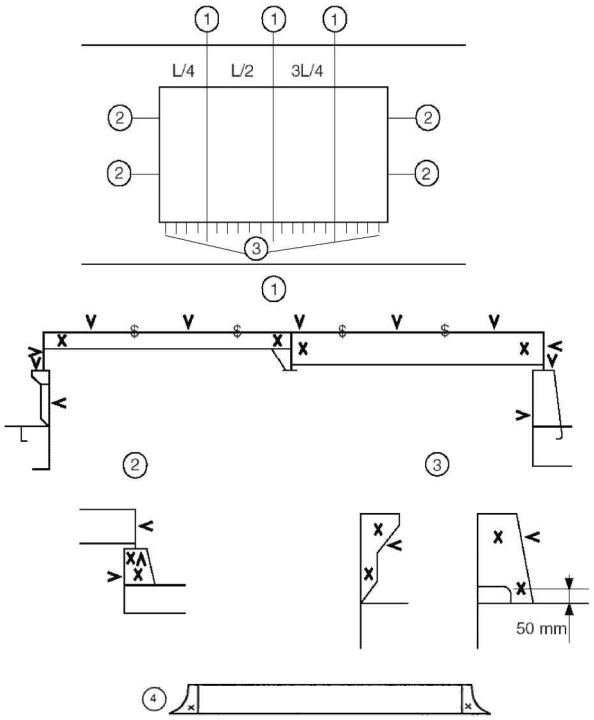

Single skin bulk carriers




(Notes) Measurements are to be taken on both port and starboard sides of the selected transverse section.

Fig 1 Locations of measurements on transverse section of single skin or double skin bulk carriers

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)

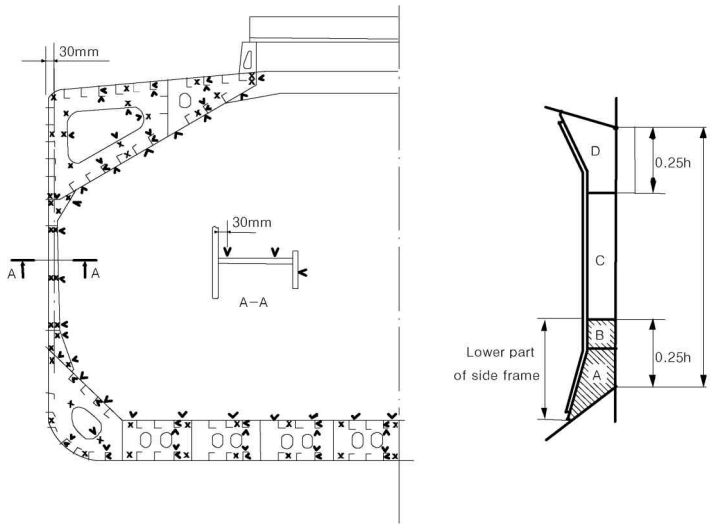



(Notes)

1. Three sections at L/4, L/2, 3L/4 of hatch cover length, including:
   - one measurement of each hatch cover plate and skirt plate
   - measurements of adjacent beams and stiffeners
   - one measurement of coaming plates and coaming flange, each side
2. Measurements of both ends of hatch cover skirt plate, coaming plate and coaming flange
3. One measurement(two points for web plate and one point for face plate) of one out of three hatch coaming brackets and bars, on both sides and both ends

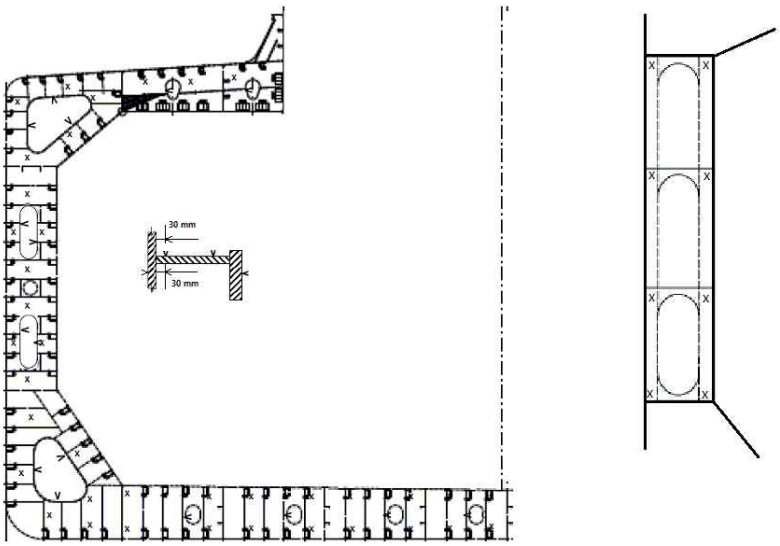
Fig 2 Locations of measurements on hatch covers and coamings

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)




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

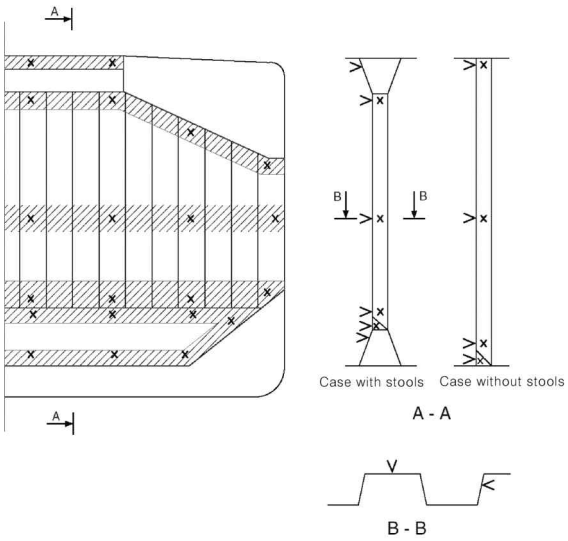
Single skin bulk carriers



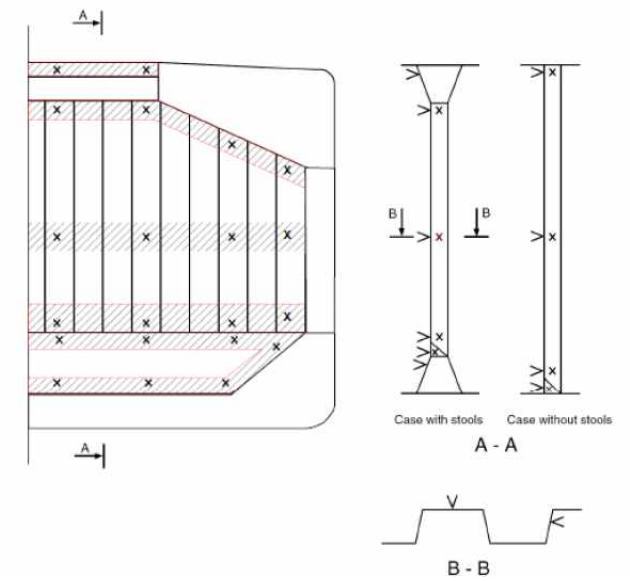

Double skin bulk carriers

Fig 3 Locations of measurements on structural members in cargo holds and ballast tanks of single skin bulk carriers and in ballast tanks(topside or hopper or side tank) of double skin bulk carriers

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)




Single skin bulk carriers

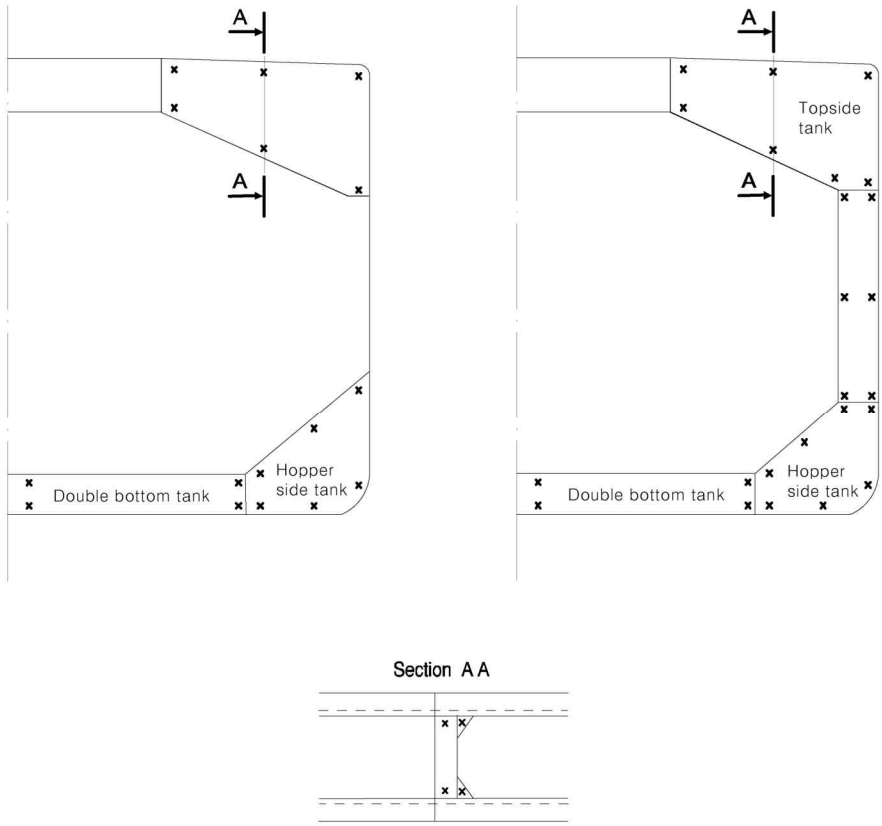



Double skin bulk carriers

(Notes) Measurements to be taken in each shaded area as per views A-A and B-B.
Additional measurements to internal structure of upper and lower stools to be added, e.g. two points in the upper and two points in the lower stools to be indicated in section A-A.

Fig 4 Location of measurements on cargo hold transverse bulkheads of single skin or double skin bulk carriers

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)




(Notes) Measurements to be taken in each vertical section as per view A-A
Two additional measurements to internal structure of double bottom tank to be added at midspan.

Fig 5 Locations of measurements on transverse bulkheads of topside, hopper, double hull and double bottom ballast tanks of single skin or double skin bulk carriers

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)

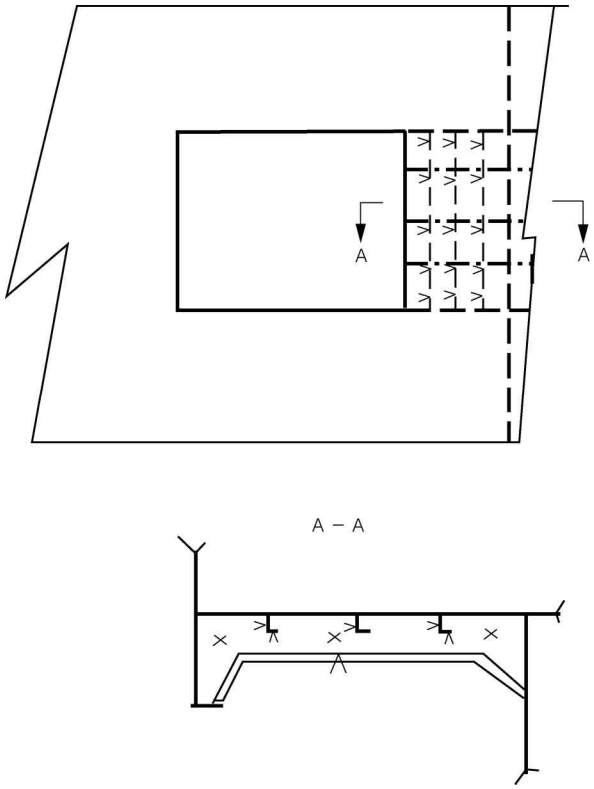



Fig 6 Locations of measurements on underdeck structure

**Table 3-2 Location and number of thickness measuring points - CSR Ships** (continued)

2) CSR double hull oil tankers

| Items | location and number of thickness measuring points | Figure reference |
|---|---|---|
| Selected plates | "Selected" means at least a single point on one out of three plates, to be chosen on 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 such as plating, longitudinals and girders 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.<br><br>For tankers older than 10 years of age:<br><br>within 0.1D (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 the web and face plate, and every plate is to be measured at one point between longitudinals. | **Fig 1** |
| Transverse rings[3] 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.<br>Minimum 4 points on the first plate below deck.<br>Additional points in way of curved parts. At least one point on each of two stiffeners between stringers / longitudinal girders. | **Fig 2** |

**Table 3-2 Location and number of thickness measuring points - CSR Ships** (continued)

| Items | location and number of thickness measuring points | Figure reference |
|---|---|---|
| Transverse bulkheads in cargo tanks | At least two points on each plate. Minimum 4 points on the first plate below main deck.<br><br>At least one point on every third stiffener to be taken between each stringer.<br><br>At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved part.<br><br>Two points of each diaphragm plate of stools if fitted. | **Fig 3** |
| Transverse bulkheads in ballast tanks | At least 4 points on plates between stringers / longitudinal girders, or per plate if stringers / girders not fitted.<br><br>At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved part.<br><br>At least one point on two stiffeners between each stringer / longitudinal girder. | **Fig 4** |
| Adjacent structural members | On adjacent structural members one point per plate and one point on every third stiffener / longitudinal. | |

(NOTES)

1. ⬭ mark : means the location to be measured.
2. ×, ∨ mark : means the point to be measured.
3. 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 (definition from IACS Common Structural Rules for Double Hull Oil Tankers(**Pt 12** or **Pt 13** of the Rules).

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)

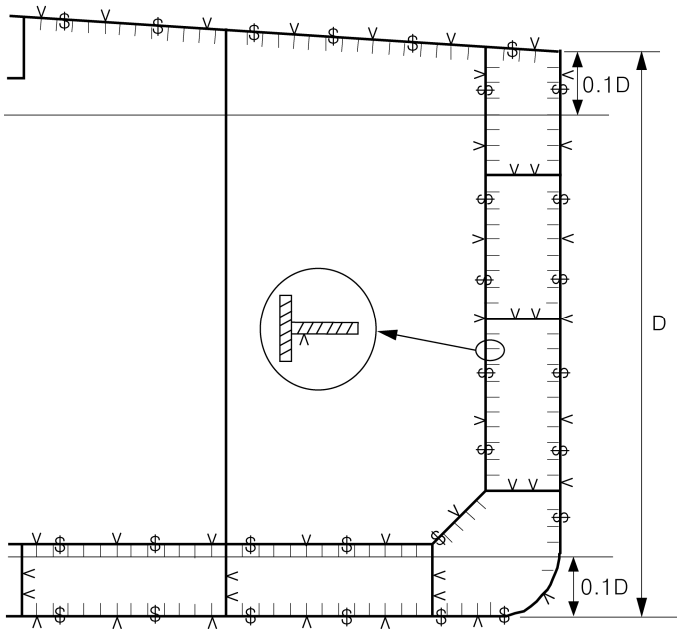



Fig 1 Locations of measurements on transverse section of double hull oil tankers

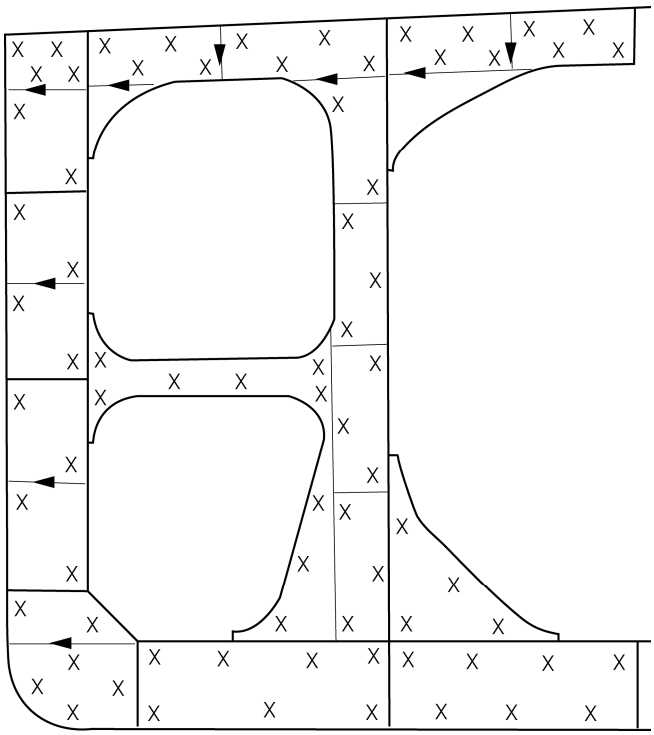


Fig 2 Locations of measurements on transverse rings in cargo and ballast tanks of double hull oil tankers

Table 3-2 Location and number of thickness measuring points - CSR Ships (continued)

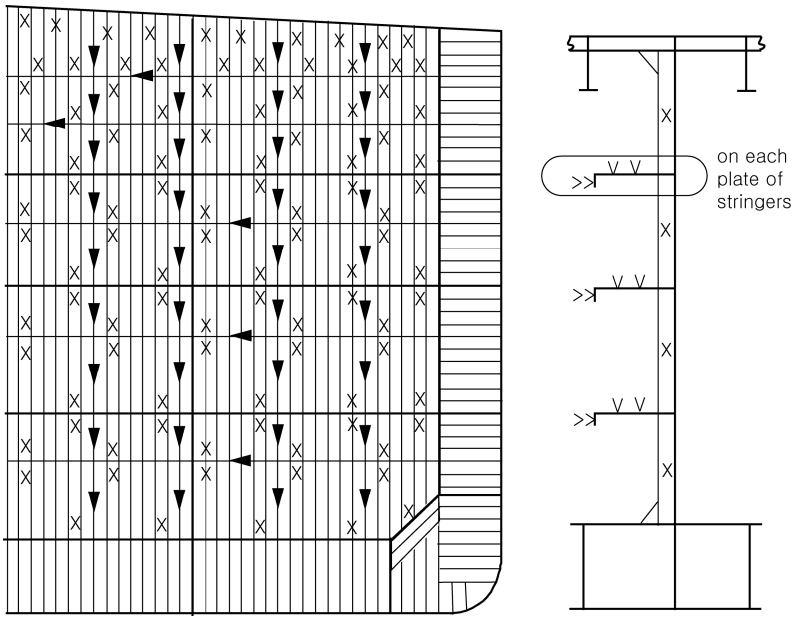



Fig 3 Locations of measurements on transverse bulkheads in cargo tanks of double hull oil tankers

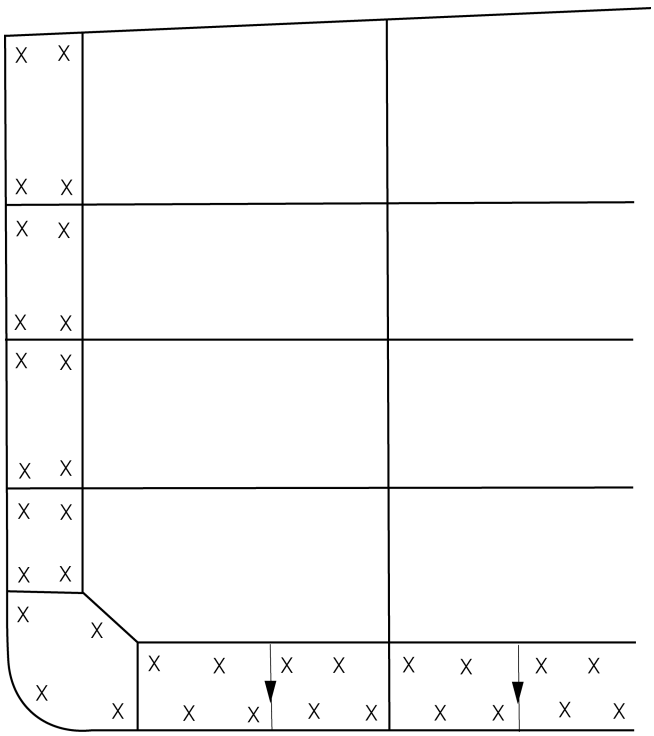


Fig 4 Locations of measurements on transverse bulkheads in ballast tanks of double hull oil tankers

**Table 4 Extent of thickness measurements at Special Survey - General Ships**

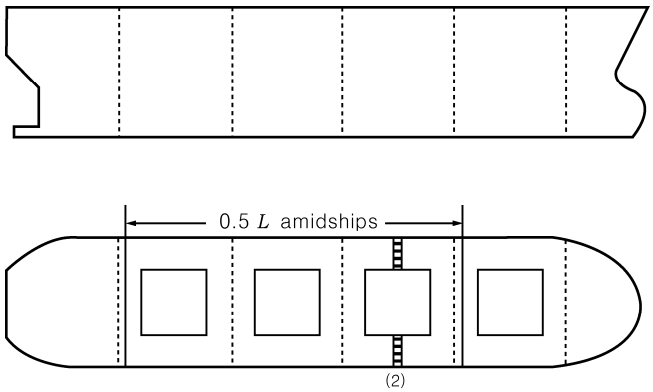
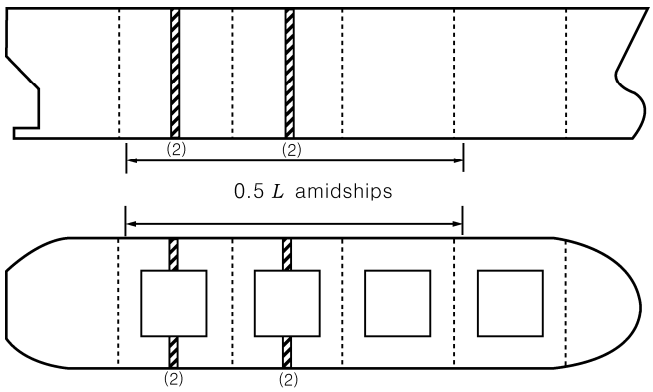
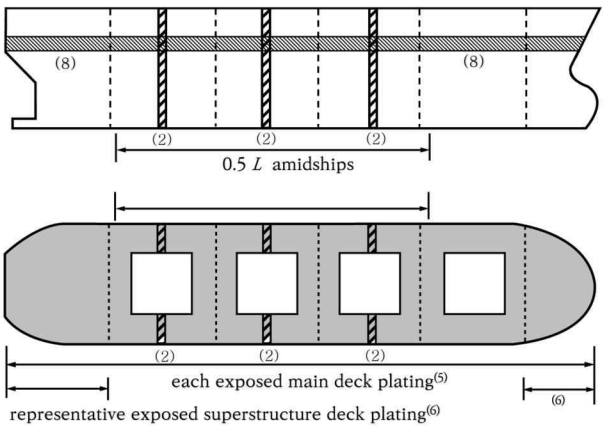
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 | (1) Suspect areas throughout the vessel |
| Special Survey No. 2 *(2023)* |  <br>(1) Suspect areas throughout the vessel<br>(2) One transverse section of deck plating within the amidships 0.5 $L$(in way of a cargo space, if applicable) |
| Special Survey No. 3 *(2023)* |  <br>(1) Suspect areas throughout the vessel<br>(2) Two transverse sections within the amidships 0.5 $L$ in way of two cargo spaces, if applicable)[4), 5), 6), 7)]<br>(3) All cargo hold hatch covers and coamings(plating and stiffeners)[9)]<br>(4) Internals in forepeak and afterpeak tanks<br>(5) All transverse bulkheads in all cargo tanks[8)]<br>(6) All transverse bulkheads in all ballast tanks[8)] |

**Table 4 Extent of thickness measurements at Special Survey - General Ships** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas throughout the vessel<br>(2) A minimum of three transverse sections within the amidships 0.5 $L$(in way of cargo spaces, if applicable)[5), 6), 7)]<br>(3) All cargo hold hatch covers and coamings(plating and stiffeners)[9)]<br>(4) Internals in forepeak and afterpeak tanks<br>(5) All exposed main deck plating full length<br>(6) Representative exposed superstructure deck plating(poop, bridge and forecastle deck)<br>(7) Lowest strake and strakes in way of 'tween decks of all transverse bulkheads in cargo spaces together with internals in way<br>(8) All wind and water strakes, port and starboard, full length<br>(9) All keel plates full length. Also, additional bottom plates in way of cofferdams, machinery space and aft end of tanks<br>(10) Plating of seachests. Shell plating in way of overboard discharges as considered necessary by the attending Surveyor<br>(11) All transverse bulkheads and one web frame ring in all cargo tanks[8)]<br>(12) All transverse bulkheads and all web frame ring in all ballast tanks[8)] |

(NOTES)

: Thickness gaugings for deck plates

: Thickness gaugings for side shell plates

: Thickness gaugings for the transverse section(applied for plates only)

: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)

1) In application to this table, General Ships means ships except Other Ships in **Table 1.2.4, 2.** of the Rules.
2) Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.
3) Thickness measurements of internals may be reduced to extent of measurement points that is sufficient to confirm the actual average condition of the structure under the coating by the Surveyor if the hard protective coating is in GOOD condition. *(2019)*
4) For ships more than 100 meters in length, at Special Survey No. 3, thickness measurements of exposed deck plating within amidship 0.5$L$ may be required.
5) For ships less than 100 meters in length, the number of transverse sections required at Special Survey No. 3 may be reduced to one (1), and the number of transverse sections required at Special Survey No. 4 and subsequent may be reduced to two (2).
6) For the pure car carrier, the extent of thickness measurement for transverse sections may by considered as follow: Exposed deck plates, side shell plates, bottom shell plates, inner bottom plates and longitudinal members in double bottom spaces.
7) Where the evaluation of longitudinal strength is required, all longitudinal structural members at the corresponding sections are to be gauged.
8) This requirement is to be applied only for tankers(including barges) for liquid cargo.
9) Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, thickness measurement shall be done of accessible parts of hatch covers structures.

Table 5 Extent of thickness measurements at Special Survey – Other Ships

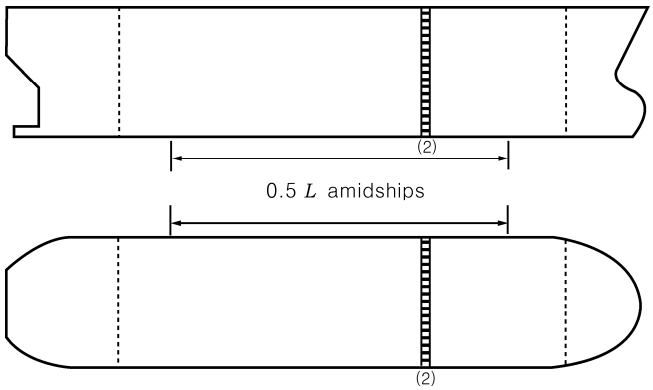
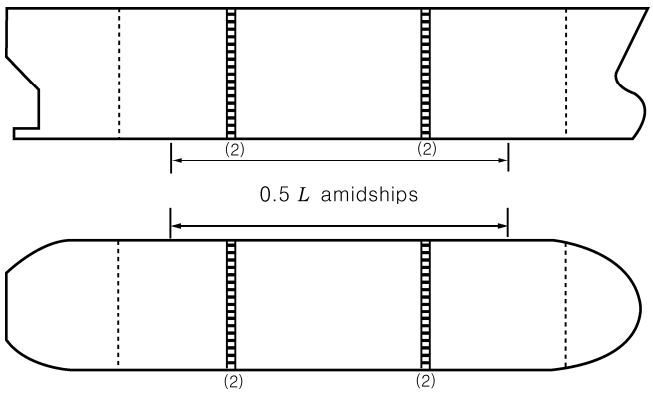
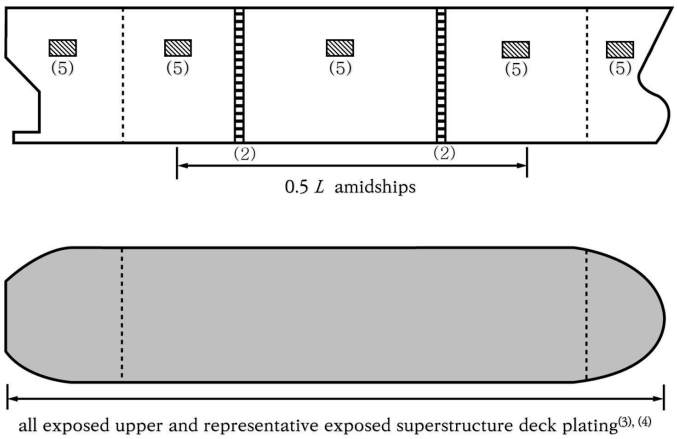
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 | (1) Suspect areas throughout the vessel |
| Special Survey No. 2 |  <br>(1) Suspect areas throughout the vessel<br>(2) One transverse section of deck plating[5], side shell plating and bottom plating within the amidships 0.5 $L$ |
| Special Survey No. 3 |  <br>(1) Suspect areas throughout the vessel<br>(2) Two transverse sections of deck plating[5], side shell plating and bottom plating within the amidships 0.5 $L$<br>(3) Internals in forepeak and afterpeak tanks |

**Table 5 Extent of thickness measurements at Special Survey – Other Ships** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas throughout the vessel<br>(2) Two transverse sections of side shell plating within the amidships 0.5 $L$<br>(3) Full length, all exposed main deck plating[5]<br>(4) Full length, representative exposed superstructure deck plating(poop, bridge and forecastle deck)<br>(5) Full length, selected wind and water strakes<br>(6) Full length, bottom plating and flat keel plating<br>(7) Internals in forepeak and afterpeak tanks |

(NOTES)

: Thickness gaugings for deck plates
: Thickness gaugings for side shell plates
: Thickness gaugings for the transverse section(applied for plates only)

1) In application to this table, Other Ships means the ship specified as follows except Special Purpose Ship – Waste in **Annex 1-1, 1.1** of the Guidance.
   – the ship type **12, 13**
   – the ship less than 500 GT and not engaged on international voyages among ship type **15, 16, 17, 19, 20** and **26** to **30**.

2) Thickness measurement locations are to be selected to provide the best representative sampling of area likely to be most exposed to corrosion.

3) Thickness measurements of internals may be specially considered by the Surveyor if the hard protective coating is in GOOD condition.

4) When the evaluation of longitudinal strength is required, all longitudinal structural members at the corresponding sections are to be gauged.

5) For fishing vessel, thickness measurement requirements in way of deck(gutter water way part and hatch coaming part) may be modified at the discretion of the Surveyor if the structure remains effectively protected against corrosion by a permanent type special coating.

**Table 6 Extent of thickness measurements at Special Survey - General Dry Cargo Ships**

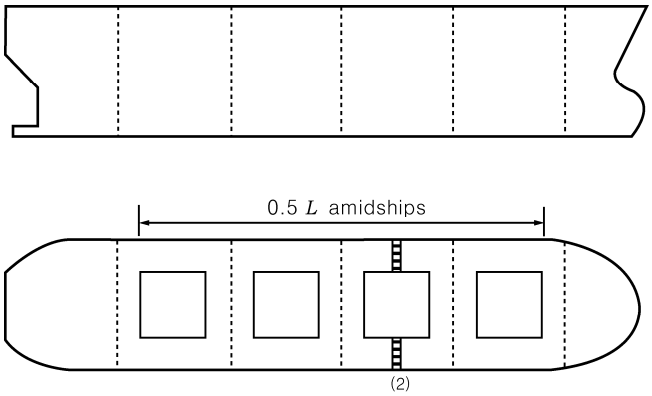
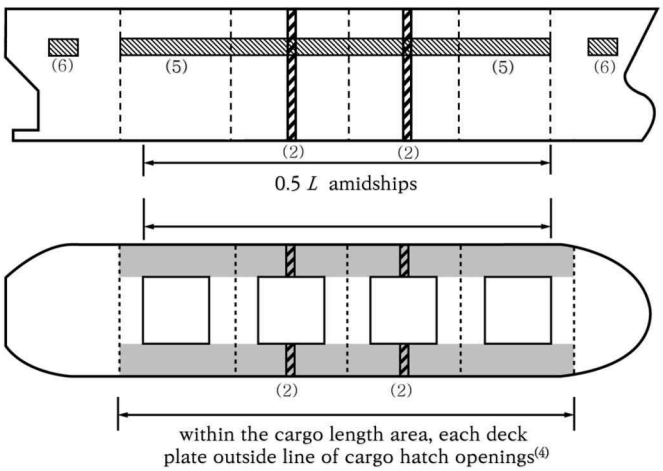
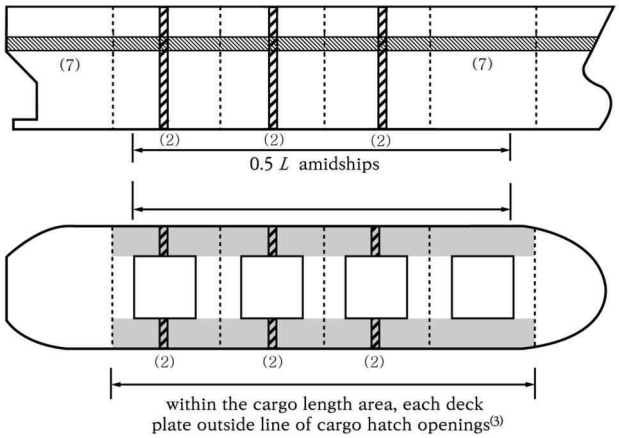
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 | (1) Suspect areas |
| Special Survey No. 2 |  <br>(1) Suspect areas<br>(2) One transverse section of deck plating in way of a cargo length area within the amidships 0.5 $L$<br>(3) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey |
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect areas<br>(2) Two transverse sections within the amidships 0.5 $L$ in way of two different cargo space[2)]<br>(3) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey<br>(4) Within the cargo length area, each deck plate outside line of cargo hatch openings<br>(5) All wind and water strakes within the cargo length area<br>(6) Selected wind and water strakes outside the cargo length area |

**Table 6 Extent of thickness measurements at Special Survey – General Dry Cargo Ships** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo length area, a minimum of three transverse sections within the amidships $0.5L$[2)]<br>(3) Within the cargo length area, each deck plate outside line of cargo hatch openings<br>(4) Within the cargo length area, each bottom plate, including lower turn of bilge<br>(5) Within the cargo length area, duct keel or pipe tunnel plating and internals<br>(6) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey<br>(7) All wind and water strakes full length |

(NOTES)

: Thickness gaugings for deck plates

: Thickness gaugings for side shell plates

: Thickness gaugings for the transverse section(applied for plates only)

: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)

1) Thickness measurement locations are to be selected to provide the best representative sampling of area likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.

2) For ships less than 100 meters in length, the number of transverse sections required at Special Survey No. 3 may be reduced to one and the number of transverse sections at Special Survey No. 4 and subsequent surveys may be reduced to two.

**Table 7 Extent of thickness measurements at Special Survey - Liquefied Gas Carriers**

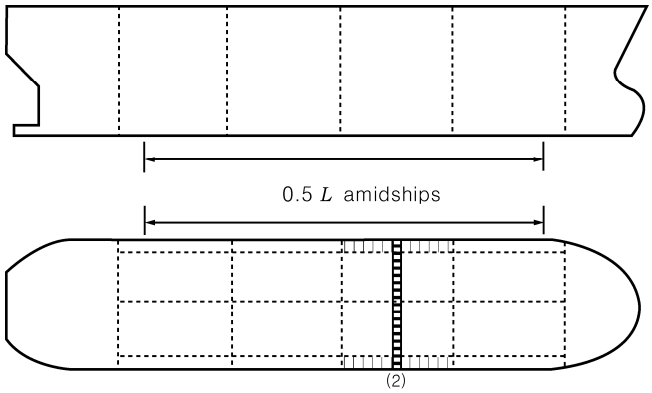
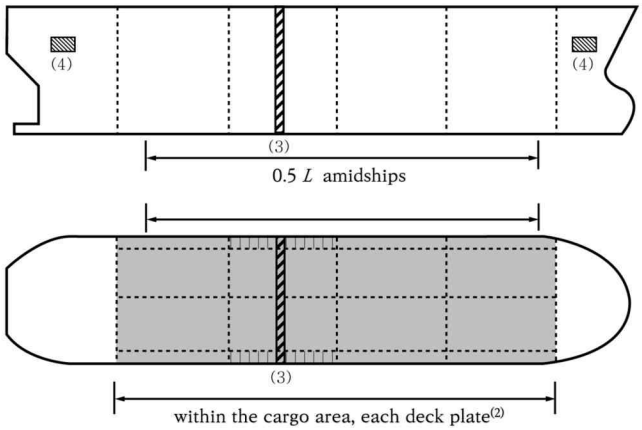
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 |  <br>(1) Suspect areas<br>(2) One section of deck plating for the full beam of the ship within 0.5 $L$ amidships in way of a ballast tank, if any<br>(3) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey |
| Special Survey No. 2 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, one transverse section within 0.5 $L$ amidships in way of a ballast tank, if any<br>(4) Selected wind and water strakes outside the cargo area<br>(5) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey |

**Table 7 Extent of thickness measurements at Special Survey – Liquefied Gas Carriers** (continued)

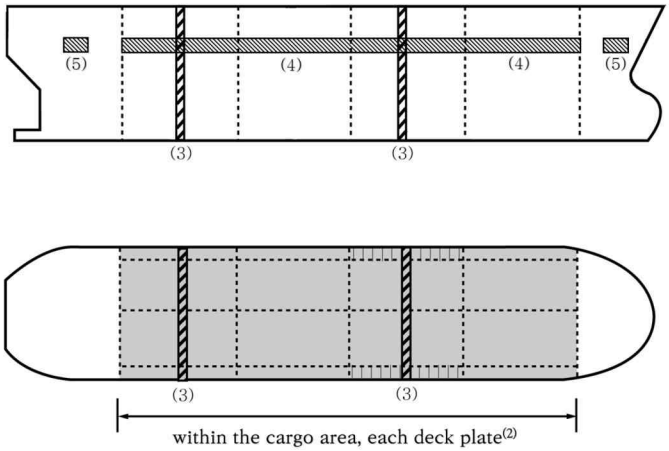
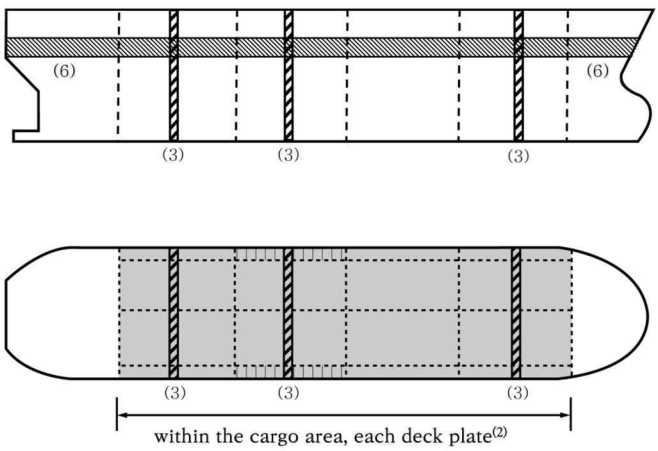
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, two transverse sections[1)]<br>(4) Within the cargo area, all wind and water strakes<br>(5) Selected wind and water strakes outside the cargo area<br>(6) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey |
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, three transverse sections[1)]<br>(4) Within the cargo area, each bottom plate<br>(5) Within the cargo area, duct keel plating and internals<br>(6) All wind and water strakes, full length<br>(7) Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up Survey |

**Table 7 Extent of thickness measurements at Special Survey – Liquefied Gas Carriers** (continued)

(NOTES)

- : Thickness gaugings for deck plates
- : Thickness gaugings for side shell plates
- : Thickness gaugings for the transverse section(applied for plates only)
- : Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)

1) At least one section is to include a ballast tank within 0.5 $L$ amidships, if any.

2) For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of thickness measurements may be increased to include the tank top plating at the discretion of the Surveyor.

3) For areas in spaces where hard protective coatings are found to be in GOOD condition, the extent of thickness measurements may be reduced by sufficiently confirming the actual average condition of the structure under the coating. *(2019)*

4) The Surveyor may extend the thickness measurements as deemed necessary. Where substantial corrosion is found, the extent of thickness measurements is to be increased to the satisfaction of the Surveyor.

**Table 8 Extent of thickness measurements at Special Survey – Bulk Carriers with ESP notation**

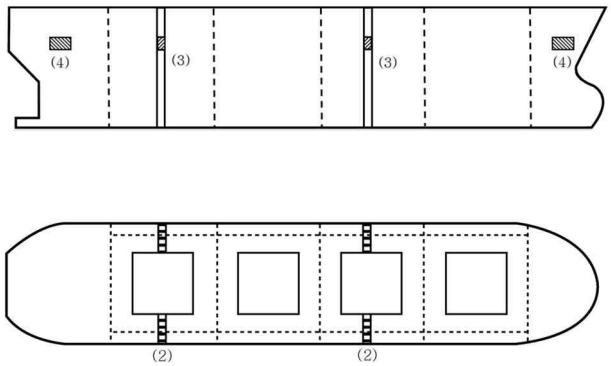
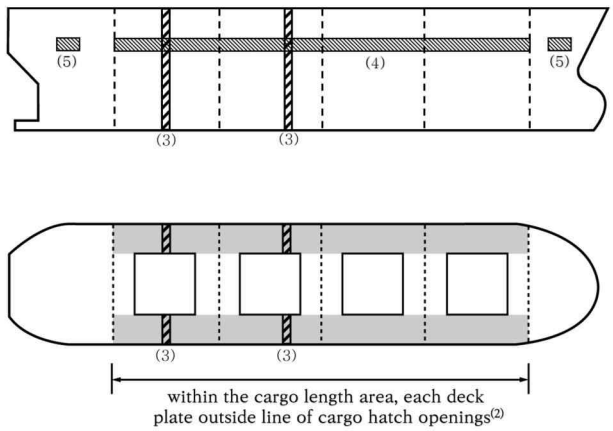
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 | (1) Suspect areas |
| Special Survey No. 2 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo length, two transverse sections of deck plating outside line of cargo hatch openings<br>(3) Wind and water strakes in way of transverse sections considered under (2) above<br>(4) Selected wind and water strakes outside the cargo length area<br>(5) Measurement for, general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) See **Ch 3, 201. 1** (4) of the Rules, **Pt 7, Ch 3, Sec 17** of the Rules and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 |
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo length, each deck plate outside line of cargo hatch openings<br>(3) Within the cargo length, two transverse sections, one in the amidship area, outside line of cargo hatch openings<br>(4) Within the cargo length, all wind and water strakes<br>(5) Selected wind and water strakes outside the cargo length area<br>(6) Measurement for, general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(7) See **Ch 3, 201. 1** (3) of the Rules and **Annex 1-5, Table 9** of the Guidance for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with IACS URs S19 and S23<br>(8) See **Ch 3, 201. 1** (4) of the Rules, **Pt 7, Ch 3, Sec 17** of the Rules and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 |

**Table 8 Extent of thickness measurements at Special Survey - Bulk Carriers with ESP notation** (continued)

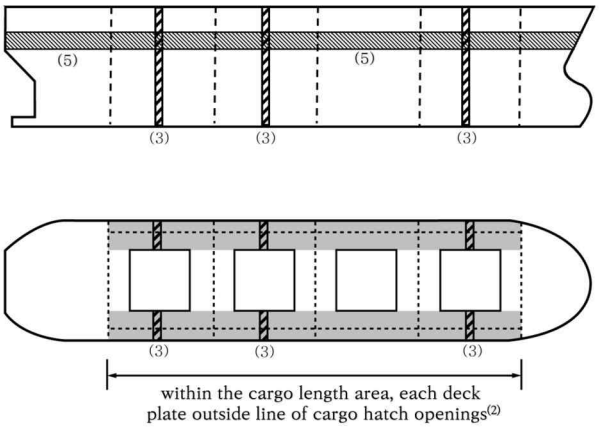
| No. of Special Survey | Structural members to be measured |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo length, each deck plate outside line of cargo hatch openings<br>(3) Within the cargo length, three transverse sections, one in the amid ship area, outside line of cargo hatch openings<br>(4) Within the cargo length, each bottom plates<br>(5) All wind and water strakes, full length<br>(6) Measurement for, general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(7) See **Ch 3, 201. 1** (3) of the Rules and **Annex 1-5, Table 9** of the Guidance for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with IACS URs S19 and S23<br>(8) See **Ch 3, 201. 1** (4) of the Rules, **Pt 7, Ch 3, Sec 17** of the Rules and the separate requirements specified by the Society for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with IACS UR S31 |
| (NOTES)<br>: Thickness gaugings for deck plates<br>: Thickness gaugings for side shell plates<br>: Thickness gaugings for the transverse section(applied for plates only)<br>: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections) | |

**Table 9 Additional thickness measurements of the vertically corrugated transverse watertight bulkhead between holds Nos. 1 and 2(Only for ships subject to IACS UR S19) *(2022)***

| Location | Vertically corrugated transverse watertight bulkhead between holds Nos. 1 and 2 |
|---|---|
| Gauging point | 1. The gauging is to be carried out at the levels as described below. To adequately assess the scantlings of each individual vertical corrugation, each corrugation flange, webs, shedder plate and gusset plate within each of the levels given below are to be gauged.<br>(1) Level (A) : Ships without lower stool (See **Fig 1**)<br>(a) The mid-breadth of the corrugation flanges at approximately 200 mm above the line of shedder plates;<br>(b) The middle of gusset plates between corrugation flanges, where fitted;<br>(c) The middle of the shedder plates;<br>(d) The mid-breadth of the corrugation webs at approximately 200 mm above the line of shedder plates.<br>(2) Level (B) : Ships with lower stool (See **Fig 2**)<br>(a) The mid-breadth of the corrugation flanges at approximately 200 mm above the line of shedder plates;<br>(b) The middle of gusset plates between corrugation flanges, where fitted;<br>(c) The middle of the shedder plates;<br>(d) The mid-breadth of the corrugation webs at approximately 200 mm above the line of shedder plates.<br>(3) Level (C) : Ships with or without lower stool (See **Fig 1** or **Fig 2**)<br>(a) The mid-breadth of the corrugation flanges and webs at about the mid-height of the corrugation.<br>2. Where the thickness changes within the horizontal levels, the thinner plate is to be gauged. |

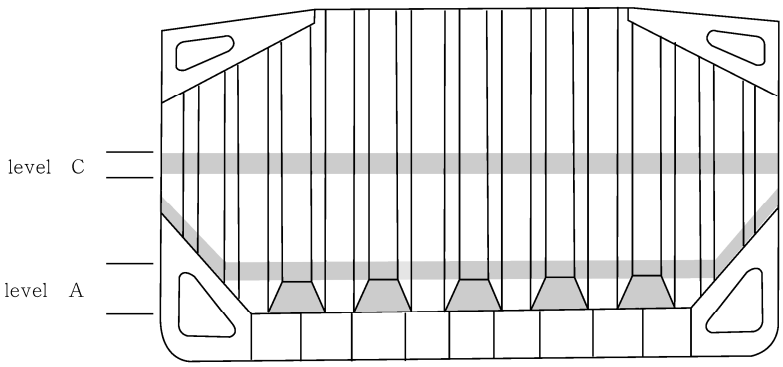



**Fig 1 Ships without lower stool**

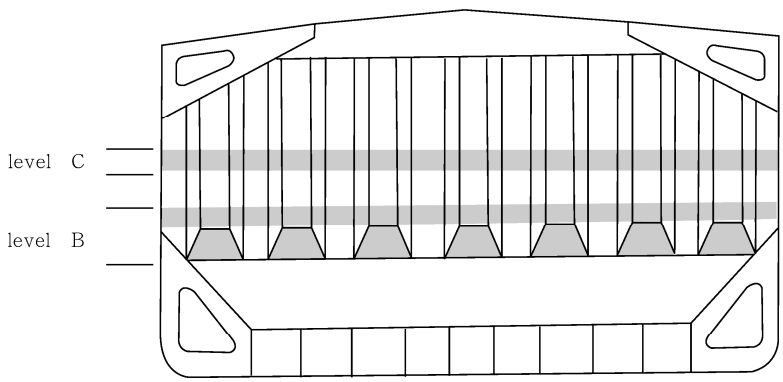



**Fig 2 Ships with lower stool**

Table 10 Extent of thickness measurements at Special Survey – Oil Tankers with ESP notation

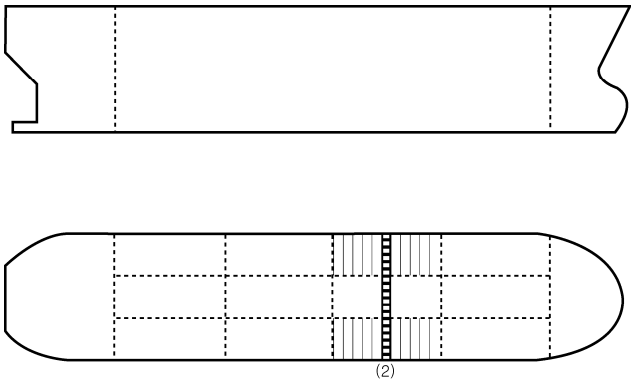
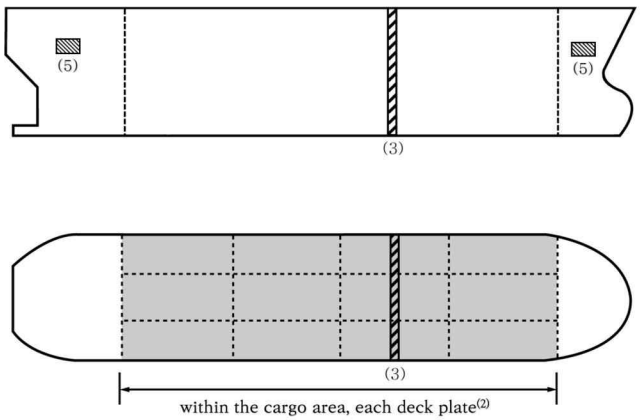
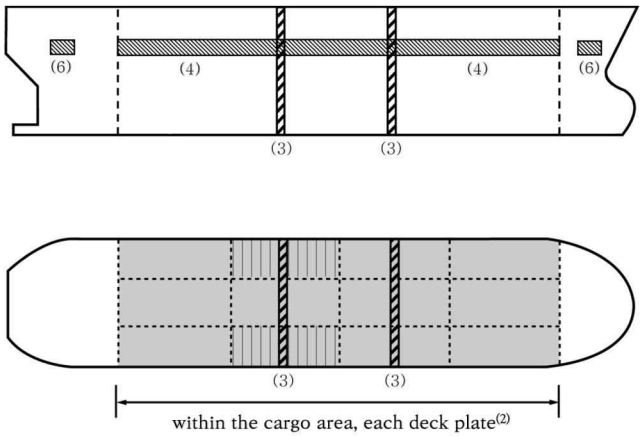
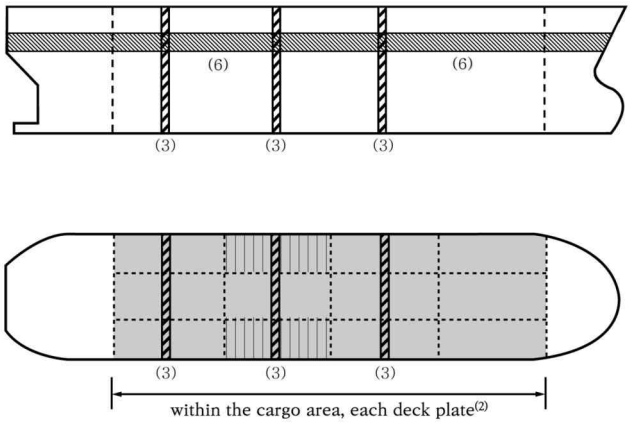
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 |  <br>(1) Suspect areas<br>(2) One transverse section of deck plates for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast)<br>(3) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey |
| Special Survey No. 2 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, one transverse section<br>(4) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(5) Selected wind and water strakes outside the cargo area |

**Table 10 Extent of thickness measurements at Special Survey – Oil Tankers with ESP notation** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect area<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, two transverse sections[1)]<br>(4) Within the cargo area, all wind and water strakes<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) Selected wind and water strakes outside the cargo area |
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, three transverse sections[1)]<br>(4) Within the cargo area, each bottom plate<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) All wind and water strakes, full length |

(NOTES)

- : Thickness gaugings for deck plates
- : Thickness gaugings for side shell plates
- : Thickness gaugings for the transverse section(applied for plates only)
- : Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)
- : Thickness gaugings in way of the ballast tank

1) At least one section is to include a ballast tank within 0.5 $L$ amidships.

Table 11 Extent of thickness measurements at Special Survey – Chemical Tankers with ESP notation

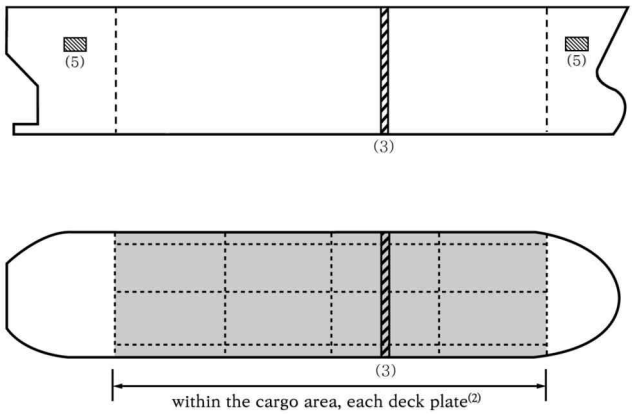
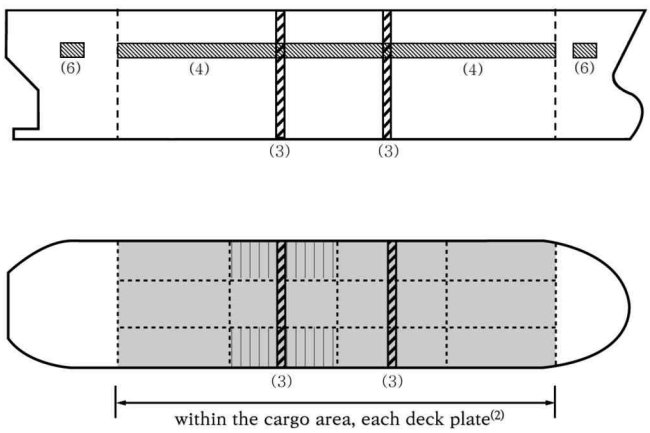
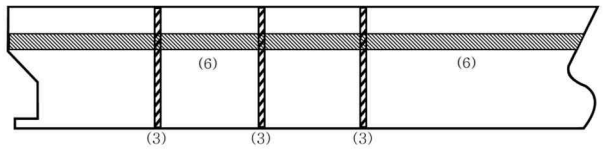
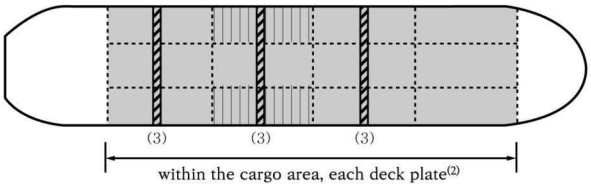
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 *(2023)* | (1) Suspect areas |
| Special Survey No. 2 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, one transverse section<br>(4) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(5) Selected wind and water strakes outside the cargo area |
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect area<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, two transverse sections[1)]<br>(4) Within the cargo area, all wind and water strakes<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) Selected wind and water strakes outside the cargo area |

**Table 11 Extent of thickness measurements at Special Survey – Chemical Tankers with ESP notation** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, three transverse sections[1)]<br>(4) Within the cargo area, each bottom plate<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) All wind and water strakes, full length |

(NOTES)

: Thickness gaugings for deck plates
: Thickness gaugings for side shell plates
: Thickness gaugings for the transverse section(applied for plates only)
: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)
: Thickness gaugings in way of the ballast tank

1) At least one section is to include a ballast tank within 0.5 $L$ amidships.

**Table 12 Extent of thickness measurements at Special Survey – Double Hull Oil Tankers with ESP notation**

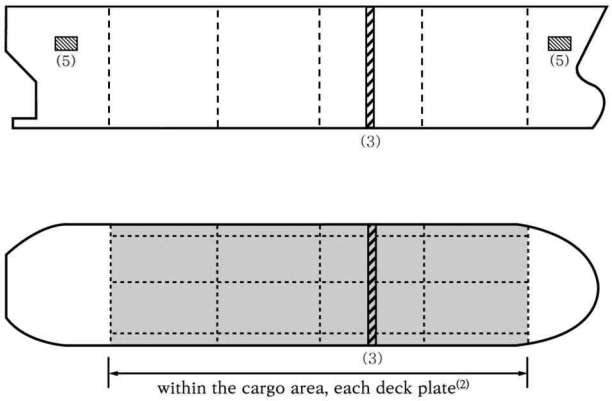
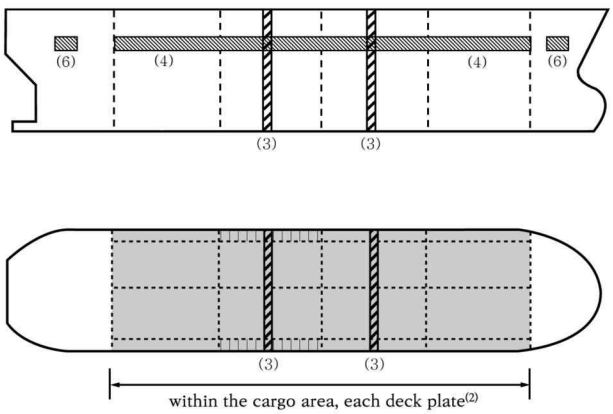
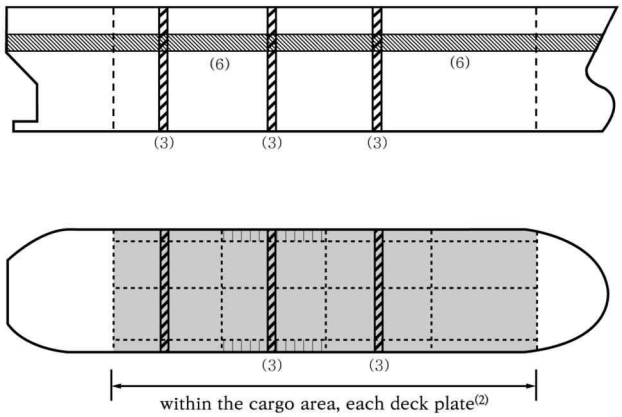
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 *(2023)* | (1) Suspect areas |
| Special Survey No. 2 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, one transverse section<br>(4) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(5) Selected wind and water strakes outside the cargo area |
| Special Survey No. 3 *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, two transverse sections[1)]<br>(4) Within the cargo area, all wind and water strakes<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) Selected wind and water strakes outside the cargo area |

**Table 12 Extent of thickness measurements at Special Survey - Double Hull Oil Tankers with ESP notation** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo area, each deck plate<br>(3) Within the cargo area, three transverse sections[1)]<br>(4) Within the cargo area, each bottom plate<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey<br>(6) All wind and water strakes, full length |

(NOTES)

: Thickness gaugings for deck plates
: Thickness gaugings for side shell plates
: Thickness gaugings for the transverse section(applied for plates only)
: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)
: Thickness gaugings in way of the ballast tank

1) At least one section is to include a ballast tank within 0.5 $L$ amidships.

**Table 13 Extent of thickness measurements at Special Survey - Double Skin Bulk Carriers with ESP notation**

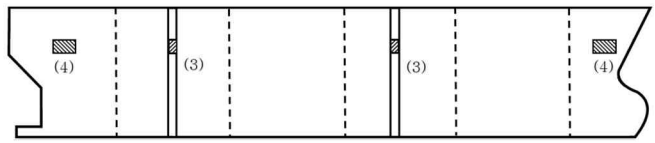
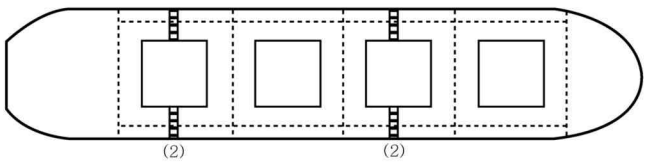
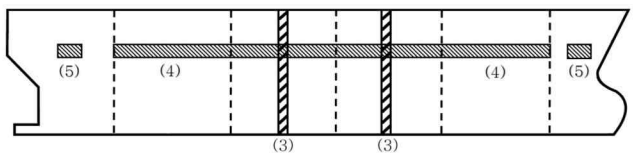
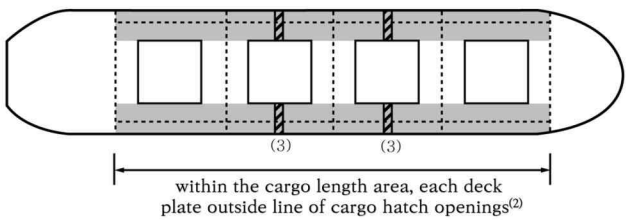
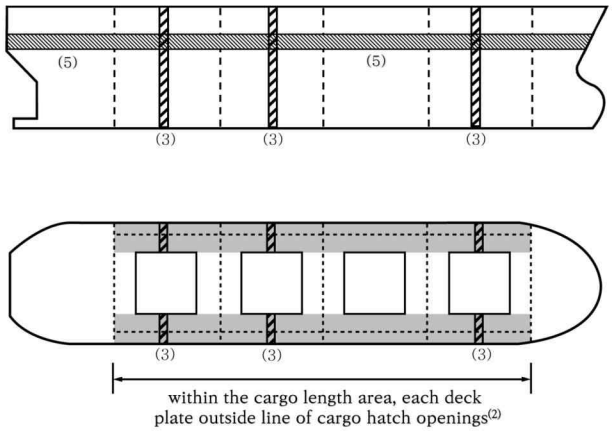
| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 1 | (1) Suspect areas |
| Special Survey No. 2 *(2024)* |  <br>  <br>(1) Suspect areas<br>(2) Within the cargo length, two transverse sections of deck plating outside line of cargo hatch openings<br>(3) Wind and water strakes in way of the two transverse sections considered (2) above<br>(4) Selected wind and water strakes outside the cargo length area<br>(5) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey |
| Special Survey No. 3 *(2024)* |  <br>  <br>(1) Suspect areas<br>(2) Within the cargo length, each deck plate outside line of cargo hatch openings<br>(3) Within the cargo length, two transverse sections, one in the amidship area, outside line of cargo hatch openings<br>(4) Within the cargo length, all wind and water strakes<br>(5) Selected wind and water strakes outside the cargo length area<br>(6) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey |

**Table 13 Extent of thickness measurements at Special Survey - Double Skin Bulk Carriers with ESP notation** (continued)

| No. of Special Survey | Extent and location of measurement |
|---|---|
| Special Survey No. 4 and Subsequent *(2024)* |  <br>(1) Suspect areas<br>(2) Within the cargo length, each deck plate outside line of cargo hatch openings<br>(3) Within the cargo length, three transverse sections, one in the amidship area, outside line of cargo hatch openings<br>(4) Within the cargo length, each bottom plate<br>(5) All wind and water strakes, full length<br>(6) Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey |

(NOTES)

: Thickness gaugings for deck plates

: Thickness gaugings for side shell plates

: Thickness gaugings for the transverse section(applied for plates only)

: Thickness gaugings for the transverse section(including longitudinal members, for transversely framed vessels including adjacent frames and their end connections in way of transverse sections)

**Table 14 Requirements for extent of thickness measurements at those areas of substantial corrosion – Bulk Carriers with ESP notation**

1) Shell Structures

| Structural Member | Extent of Measurement | Pattern of measurement |
|---|---|---|
| 1. Bottom and Side Shell Plating | 1) Suspect plate, plus four adjacent plates<br>2) See other tables for particulars on gauging in way tanks and cargo holds | 1) 5 point pattern for each panel between longitudinals |
| 2. Bottom/Side Shell Longitudinals | Minimum of three longitudinals in way of suspect areas | 3 measurement in line across web<br>3 measurement on flange |

2) Transverse Bulkheads in Cargo Holds

| Structural member | Extent of Measurement | Pattern of measurement |
|---|---|---|
| 1. Lower Stool | 1) Transverse band within 25 mm of welded connection to inner-bottom<br>2) Transverse band within 25 mm of welded connection to shelf plate | 1) 5 point between stiffeners over 1 metre length<br>2) 5 point between stiffeners over 1 metre length |
| 2. Transverse Bulkhead | 1) Transverse band at approximately mid height<br>2) Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with upper stools) | 1) 5 point pattern over 1 sq. metre of plating<br>2) 5 point pattern over 1 sq. metre of plating |

3) Deck Structure including Cross Strips, Main Cargo Hatchways, Hatch Covers, Coamings and Topside Tanks

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Cross Deck Strip Plating | Suspect cross deck strip plating | 5 point pattern between underdeck stiffeners over 1 metre length |
| 2. Underdeck Stiffeners | 1) Transverse members<br><br>2) Longitudinal member | 1) 5 point pattern at each end and mid span<br><br>2) 5 point pattern on both web and flange |
| 3. Hatch Covers | 1) Side and end skirts, each 3 locations<br><br>2) 3 longitudinal bands, outboard strakes (2) and centerline strake (1) | 1) 5 point pattern at each location<br><br>2) 5 point measurement each band |
| 4. Hatch Coamings | Each side and end of coaming, one band lower 1/3, one band upper 2/3 of coaming | 5 point measurement each band i.e. end or side coaming |
| 5. Topside Ballast Tanks | 1) Watertight transverse bulkheads<br>a) lower 1/3 of bulkhead<br>b) upper 2/3 of bulkhead<br>c) stiffeners<br><br>2) 2 representative swash transverse bulkheads<br>a) lower 1/3 of bulkhead<br>b) upper 2/3 of bulkhead<br>c) stiffeners<br><br>3) 3 representative bays of slop plating<br>a) lower 1/3 of tank<br>b) upper 2/3 of tank<br><br>4) Longitudinals, suspect and adjacent | 1)<br>a) 5 point pattern over 1 sq. metre of plating<br>b) 5 point pattern over 1 sq. metre of plating<br>c) 5 point pattern over 1 metre length<br><br>2)<br>a) 5 point pattern over 1 sq. metre of plating<br>b) 5 point pattern over 1 sq. metre of plating<br>c) 5 point pattern over 1 metre length<br><br>3)<br>a) 5 point pattern over 1 sq. metre of plating<br>b) 5 point pattern over 1 sq. metre of plating<br><br>4) 5 point pattern both web and flange over 1 metre length |
| 6. Main Deck Plating | Suspect plates and adjacent (4) | 5 point pattern over 1 sq. metre of plating |
| 7. Main Deck Longitudinals | Minimum of 3 longitudinals where plating measured | 5 point pattern on both web and flange over 1 metre length |
| 8. Web Frames /Transverses | Suspect plates | 5 point pattern over 1 sq. metre |

**Table 14 Requirements for extent of thickness measurements at those areas of substantial corrosion – Bulk Carriers with ESP notation** (continued)

4) Double Bottom and Hopper Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Inner/Double Bottom Plating | Suspect plate plus all adjacent plates | 5 point pattern for each panel between longitudinals over 1 metre length |
| 2. Inner/Double Bottom Longitudinals | Three longitudinals where plates measured | 3 measurements in line across web and 3 measurements on flange |
| 3. Longitudinal Girders or Transverse Floors | Suspect plates | 5 point pattern over about 1 square metre |
| 4. Watertight Bulkhead (W.T Floors) | 1) lower 1/3 of tank<br>2) upper 2/3 of tank | 1) 5 point pattern over 1 sq. metre of plating<br>2) 5 point pattern alternate plates over 1 sq. metre of plating |
| 5. Web Frames | Suspect plating | 5 point pattern over 1 sq. metre of plating |
| 6. Bottom/Side Shell Longitudinals | Minimum of three longitudinals in way of suspect areas | 3 measurements in line across web<br>3 measurements on flange |

5) Cargo Holds

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Side Shell Frames | Suspect frame and each adjacent frame | a) At each end and mid span : 5 point pattern of both web and flange<br>b) 5 point pattern within 25 mm of welded attachment of both shell and lower slope plate |

**Table 15 Requirements for extent of thickness measurements at those areas of substantial corrosion – Oil Tankers, Ore/Oil Ships, Etc. with ESP notation**

1) Bottom Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Bottom Plating | Minimum of 3 bays across tank including aft bay.<br>Measurements around and under all bell mouths | 5 point pattern for each panel between longitudinals and webs |
| 2. Bottom Longitudinals | Minimum of 3 longitudinals in each bay where bottom plating measured | 3 measurements in line across flange and 3 measurements on vertically web |
| 3. Bottom Girders and Brackets | At fore and aft transverse bulkhead bracket toes and in centre of tanks | Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements.<br>Two measurements across face flat.<br><br>5 point pattern on girder/bulkhead brackets. |
| 4. Bottom Transverse Webs | 3 webs in bays where bottom plating measured, with measurements at both ends and middle | 5 points pattern over 2 square metre area<br><br>Single measurements on face flat |
| 5. Panel Stiffening | Where provided | Single measurements |

2) Deck Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deck Plating | Two bands across tank | Minimum of three measurements per plate per band |
| 2. Deck Longitudinals | Minimum of 3 longitudinals in each of two bands | 3 measurements in line vertically on webs, and 2 measurements on flange (if fitted) |
| 3. Deck Girders and Brackets | At fore and aft transverse bulkhead, bracket toes and in centre of tanks | Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements.<br><br>Two measurements across face flat.<br><br>5 point pattern on girder/bulkhead brackets. |
| 4. Deck Transverse Webs | Minimum of two webs with measurements at middle and both ends of span | 5 points pattern over about 2 square metre areas<br><br>Single measurements on face flat |
| 5. Panel Stiffening | Where provided | Single measurement |

**Table 15 Requirements for extent of thickness measurements at those areas of substantial corrosion – Oil Tankers, Ore/Oil Ships, Etc. with ESP notation** (continued)

3) Side Shell and Longitudinal Bulkheads

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deckhead and Bottom Strakes, and Strakes in way of Stringer Platforms | Plating between each pair of longitudinals in a minimum of 3 bays | Single measurement |
| 2. All Other Strakes | Plating between every 3rd pair of longitudinals in same 3 bays | Single measurement |
| 3. Longitudinals-deckhead and Bottom Strakes | Each longitudinal in same 3 bays | 3 measurements across web and 1 measurement on flange |
| 4. Longitudinals – All Others | Every third longitudinal in same 3 bays | 3 measurements across web and 1 measurement on flange |
| 5. Longitudinals – Bracket | Minimum of three at top, middle and bottom of tank in same 3 bays | 5 point pattern over area of bracket |
| 6. Web Frames and Cross Ties | 3 webs with minimum of three locations on each web, including in way of cross tie connections | 5 point pattern over about 2 square metre area, plus single measurements on web frame and cross tie face flats |

4) Transverse Bulkheads and Swash Bulkheads

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deckhead and Bottom Strakes, and Strakes in way of Stringer Platforms | Plating between pair of stiffeners at three locations – approx. 1/4, 1/2 and 3/4 width of tank | 5 points pattern between stiffeners over 1 meter length |
| 2. All Other Strakes | Plating between pair of stiffeners at middle location | Single measurement |
| 3. Strakes in Corrugated Bulkheads | Plating for each change of scantling at centre of panel and a flange or fabricated connection | 5 point pattern over about 1 square metre of plating |
| 4. Stiffeners | Minimum of three typical stiffeners | For web, 5 point pattern over span between bracket connections (2 measurements across web at each bracket connection, and one at centre of span)For flange, single measurements at each bracket toe and at centre of span |
| 5. Brackets | Minimum of three at top, middle and bottom of tank | 5 point pattern over areas of bracket |
| 6. Deep Webs and Girders | measurements at toe of bracket and at centre of span | For web, 5 point pattern over about 1 square metre<br>3 measurements across face flat |
| 7. Stringer Platforms | All stringers with measurements at both ends and middle | 5 point pattern over 1 square metre of area plus single measurements near bracket toes and on face flats |

**Table 16 Requirements for extent of thickness measurements at those areas of substantial corrosion – Chemical Tankers with ESP notation**

1) Bottom, Inner Bottom and Hopper Structure

| Structure Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Bottom, Inner Bottom and Hopper Structure Plating | Minimum of three bays across double bottom tank, including aft bay. Measurements around and under all suction bell mouths | 5-point pattern for each panel between longitudinals and floors |
| 2. Bottom, Inner Bottom and Hopper Structure Longitudinals | Minimum of three longitudinals in each bay where bottom plating measured | Three measurements in line across the flange and three measurements on vertical web |
| 3. Bottom Girders, including the watertight ones | At fore and aft watertight floor and in centre of tanks | Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements.<br>Two measurements across face flat where fitted. |
| 4. Bottom Floors, including the watertight ones | Three floors in bays where bottom plating measured, with measurements at both ends and middle | 5-point pattern over two square metre area |
| 5. Hopper Structure Web Frame Ring | Three floors in bays where bottom plating measured | 5-point pattern over one square metre of plating. Single measurements on flange |
| 6. Hopper Structure Transverse Watertight Bulkhead or Swash Bulkhead | · Lower 1/3 of the bulkhead | · 5-point pattern over one square meter of plating |
| | · Upper 2/3 of the bulkhead | · 5-point pattern over two square metre of plating |
| | · Stiffeners(minimum of three) | · For web, 5-point pattern over span(two measurements across web at each end and one at centre of span)<br>· For flange, single measurements at each end and centre of span |
| 7. Panel Stiffening | Where applicable | Single measurements |

2) Deck Structure

| Structure Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deck Plating | Two transverse bands across tank | Minimum of three measurements per plate per band |
| 2. Deck Longitudinals | Every third longitudinal in each two bands with a minimum of one longitudinal | Three measurements in line vertically on webs and two measurements on flange(if fitted) |
| 3. Deck Girders and Brackets | At fore and aft transverse bulkhead, bracket toes and in centre of tanks | Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements.<br>Two measurements across flange.<br>5 point pattern on girder/bulkhead brackets |
| 4. Deck Transverse Webs | Minimum of two webs, with measurements at both ends and middle of span | 5-point pattern over one square metre area. Single measurements on flange |
| 5. Vertical Web and Transverse Bulkhead in Wing Ballast Tank for double hull design(two metres from deck) | Minimum of two webs, and both transverse bulkheads | 5-point pattern over one square metre area |
| 6. Panel Stiffening | Where applicable | Single measurements |

**Table 16 Requirements for extent of thickness measurements at those areas of substantial corrosion – Chemical Tankers with ESP notation** (continued)

3) Side Shell and Longitudinal Bulkheads

| Structure Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Side Shell and Longitudinal Bulkhead Plating<br>· Deckhead and Bottom Strakes, and Strakes in way of Horizontal Girders<br>· All Other Strakes | · Plating between each pair of longitudinals in a minimum of three bays(along the tank)<br>· Plating between every third pair of longitudinals in same three bays | · Single measurement<br>· Single measurement |
| 2. Side Shell and Longitudinal Bulkhead Longitudinals on:<br>· Deckhead and Bottom Strakes<br>· All Other Strakes | · Each longitudinal in same three bays<br>· Every third longitudinal in same three bays | · 3 measurements across web and 1 measurement on flange<br>· 3 measurements across web and 1 measurement on flange |
| 3. Longitudinals – Brackets | Minimum of three at top, middle and bottom of tank in same three bays | 5-point pattern over area of bracket |
| 4. Vertical Web and Transverse Bulkheads of Double Side Tanks (excluding deckhead area):<br>· Strakes in way of Horizontal Girders<br>· Other Strakes | · Minimum of two webs and both transverse bulkheads<br>· Minimum of two webs and both transverse bulkheads | · 5-point pattern over approx. two square metre area<br>· Two measurements between each pair of vertical stiffeners |
| 5. Web Frames and Cross Ties for Other Tanks than Double Side Tanks | Three webs with minimum of three locations on each web, including in way of cross tie connections and lower end bracket | 5-point pattern over approximately two square metre area of webs, plus single measurements on flanges of web frame and cross ties |
| 6. Horizontal Girders | Plating on each girder in a minimum of three bays | Two measurements between each pair of longitudinal girder stiffeners |
| 7. Panel Stiffening | Where applicable | Single measurements |

4) Transverse Watertight and Swash Bulkheads

| Structure Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Upper and Lower Stool, where fitted | · Transverse band within 25 mm of welded connection to inner bottom/deck plating<br>· Transverse band within 25 mm of welded connection to shelf plate | 5-point pattern between stiffeners over one metre length |
| 2. Deckhead and Bottom Strakes, and Strakes in way of Horizontal Stringers | Plating between pair of stiffeners at three locations: approximately 1/4, 1/2 and 3/4 width of tank | 5-point pattern between stiffeners over one metre length |
| 3. All Other Strakes | Plating between pair of stiffeners at middle location | Single measurement |
| 4. Strakes in Corrugated Bulkheads | Plating for each change of scantling at centre of panel and at flange of fabricated connection | 5-point pattern over about one square metre of plating |
| 5. Stiffeners | Minimum of three typical stiffeners | For web, 5-point pattern over span between bracket connections (two measurements across web at each bracket connection and one at centre of span).<br>For flange, single measurements at each bracket toe and at centre of span |
| 6. Brackets | Minimum of three at top, middle and bottom of tank | 5-point pattern over area of bracket |
| 7. Horizontal Stringers | All stringers with measurements at both ends and middle | 5-point pattern over one square metre area, plus single measurements near bracket toes and on flanges |
| 8. Deep Webs and Girders | Measurements at toe of bracket and at centre of span | For web, 5-point pattern over about one square metre. three measurements across face flat |

**Table 17 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Hull Oil Tankers with ESP notation**

1) Bottom, Inner Bottom and Hopper Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Bottom, Inner Bottom and Hopper Structure Plating | Minimum of three bays across double bottom tank, including aft bay. Measurements around and under all suction bell mouths | 5-point pattern for each panel between longitudinals and floors |
| 2. Bottom, Inner Bottom and Hopper Structure Longitudinals | Minimum of three longitudinals in each bay where bottom plating measured | Three measurements in line across flange and three measurements on vertical web |
| 3. Bottom Girders, including the watertight ones | At fore and aft watertight floors and in centre of tanks | Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements |
| 4. Bottom Floors, including the watertight ones | Three floors in bays where bottom plating measured, with measurements at both ends and middle | 5-point pattern over two square metre area |
| 5. Hopper Structure Web Frame Ring | Three floors in bays where bottom plating measured | 5-point pattern over one square metre of plating. Single measurements on flange |
| 6. Hopper Structure Transverse Watertight Bulkhead or Swash Bulkhead | · Lower 1/3 of bulkhead | · 5-point pattern over one square metre of plating |
| | · Upper 2/3 of bulkhead | · 5-point pattern over two square metre of plating |
| | · Stiffeners (minimum of three) | · For web, 5-point pattern over span (two measurements across web at each end and one at centre of span).<br>· For flange, single measurements at each end and centre of span |
| 7. Panel Stiffening | Where applicable | Single measurements |

2) Deck Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deck Plating | Two transverse bands across tank | Minimum of three measurements per plate per band |
| 2. Deck Longitudinals | Every third longitudinal in each of two bands with a minimum of one longitudinal | Three measurements in line vertically on webs and two measurements on flange (if fitted) |
| 3. Deck Girders and Brackets (usually in cargo tanks only) | At fore and aft transverse bulkhead, bracket toes and in centre of tanks | Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements.<br><br>Two measurements across flange. 5-point pattern on girder/bulkhead brackets |
| 4. Deck Transverse Webs | Minimum of two webs, with measurements at both ends and middle of span | 5-point pattern over one square metre area. Single measurements on flange |
| 5. Vertical Web and Transverse Bulkhead in Wing Ballast Tank (two metres from deck) | Minimum of two webs, and both transverse bulkheads | 5-point pattern over one square metre area |
| 6. Panel Stiffening | Where applicable | Single measurements |

**Table 17 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Hull Oil Tankers with ESP notation** (continued)

3) Structure in Wing Ballast Tanks

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Side Shell and Longitudinal Bulkhead Plating :<br>· Upper Strake and Strakes in way of Horizontal Girders<br>· All Other Strakes | · Plating between each pair of longitudinals in a minimum of three bays (along the tank)<br>· Plating between every third pair of longitudinals in same three bays | · Single measurement<br>· Single measurement |
| 2. Side Shell and Longitudinal Bulkhead Longitudinals on :<br>· Upper Strake<br>· All Other Strakes | · Each longitudinal in same three bays<br>· Every third longitudinal in same three bays | · 3 measurements across web and 1 measurement on flange<br>· 3 measurements across web and 1 measurement on flange |
| 3. Longitudinals – Brackets | Minimum of three at top, middle and bottom of tank in same three bays | 5-point pattern over area of bracket |
| 4. Vertical Web and Transverse Bulkheads (excluding deckhead area) :<br>· Strakes in way of Horizontal Girders<br>· Other Strakes | · Minimum of two webs and both transverse bulkheads<br>· Minimum of two webs and both transverse bulkheads | · 5-point pattern over approx. two square metre area<br>· two measurement between each pair of vertical stiffeners |
| 5. Horizontal Girders | Plating on each girder in a minimum of three bays | Two measurements between each pair of longitudinal girder stiffeners |
| 6. Panel Stiffening | Where applicable | Single measurements |

4) Longitudinal Bulkheads in Cargo Tanks

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Deckhead and Bottom Strakes, and Strakes in way of the Horizontal Stringers of Transverse Bulkheads | Plating between each pair of longitudinal in a minimum of three bays | Single measurement |
| 2. All Other Strakes | Plating between every third pair of longitudinals in same three bays | Single measurement |
| 3. Longitudinals on Deckhead and Bottom Strakes | Each longitudinal in same three bays | Three measurements across web and one measurement on flange |
| 4. All Other Longitudinals | Every third longitudinal in same three bays | Three measurements across web and one measurement on flange |
| 5. Longitudinals - Brackets | Minimum of three at top, middle and bottom of tank in same three bays | 5-point pattern over area of bracket |
| 6. Web Frames and Cross Ties | Three webs with minimum of three locations on each web, including in way of cross tie connections | 5-point pattern over approximately two square metre area of webs, plus single measurements on flanges of web frame and cross ties |
| 7. Lower End Brackets (opposite side of web frame) | Minimum of three brackets | 5-point pattern over approximately two square metre area of brackets, plus single measurements on bracket flanges |

**Table 17 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Hull Oil Tankers with ESP notation** (continued)

5) Transverse Watertight and Swash Bulkheads in Cargo Tanks

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Upper and Lower Stool, where fitted | · Transverse band within 25 mm of welded connection to inner bottom/deck plating<br>· Transverse band within 25 mm of welded connection to shelf plate | 5-point pattern between stiffeners over one metre length |
| 2. Deckhead and Bottom Strakes, and Strakes in way of Horizontal Stringers | Plating between pair of stiffeners at three locations : approximately 1/4, 1/2 and 3/4 width of tank | 5-point pattern between stiffeners over one metre length |
| 3. All Other Strakes | Plating between pair of stiffeners at middle location | Single measurement |
| 4. Strakes in Corrugated Bulkheads | Plating for each change of scantling at centre of panel and at flange of fabricated connection | 5-point pattern over about one square metre of plating |
| 5. Stiffeners | Minimum of three typical stiffeners | For web, 5-point pattern over span between bracket connections (two measurements across web at each bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span |
| 6. Brackets | Minimum of three at top, middle and bottom of tank | 5-point pattern over area of bracket |
| 7. Horizontal Stringers | All stringers with measurements at both ends and middle | 5-point pattern over one square metre area, plus single measurements near bracket toes and on flanges |

**Table 18 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Skin Bulk Carriers with ESP notation**

1) Bottom, Inner Bottom and Hopper Structure

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Bottom, Inner Bottom and Hopper Structure Plating | Minimum of three bays across double bottom tank, including aft bay.<br><br>Measurements around and under all suction bell mouths | 5-point pattern for each panel between longitudinals and floors |
| 2. Bottom, Inner Bottom and Hopper Structure Longitudinals | Minimum of three longitudinals in each bay where bottom plating measured | Three measurements in line across flange and three measurements on the vertical web |
| 3. Bottom Girders, including the watertight ones | At fore and aft watertight floors and in centre of tanks | Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements |
| 4. Bottom Floors, including the watertight ones | Three floors in the bays where bottom plating measured, with measurements at both ends and middle | 5-point pattern over two square metre area |
| 5. Hopper Structure Web Frame Ring | Three floors in bays where bottom plating measured | 5-point pattern over one square metre of plating. Single measurements on flange |
| 6. Hopper Structure Transverse Watertight Bulkhead or Swash Bulkhead | · Lower 1/3 of bulkhead | · 5-point pattern over one square metre of plating |
| | · Upper 2/3 of bulkhead | · 5-point pattern over two square metre of plating |
| | · Stiffeners(minimum of three) | · For web, 5-point pattern over span(two measurements across web at each end and one at centre of span).<br><br>· For flange, single measurements at each end and centre of span |
| 7. Panel Stiffening | Where applicable | Single measurement |

**Table 18 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Skin Bulk Carriers with ESP notation** (continued)

2) Deck Structure including Cross Strips, Main Cargo Hatchways, Hatch Covers, Coamings and Topside Tanks

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Cross Deck Strip Plating | Suspect cross deck strip plating | 5-point pattern between underdeck stiffeners over 1 metre length |
| 2. Underdeck Stiffeners | 1) Transverse members<br>2) Longitudinal members | 1) 5-point pattern at each end and mid span<br>2) 5-point pattern on both web and flange |
| 3. Hatch Covers | 1) Side and end skirts, each three locations<br>2) Three longitudinal bands, outboard strakes(2) and centerline strake(1) | 1) 5-point pattern at each location<br>2) 5-point measurement each band |
| 4. Hatch Coamings | Each side and end of coaming, one band lower 1/3, one band upper 2/3 of coaming | 5-point measurement each band i.e. end or side coaming |
| 5. Topside Ballast Tanks | 1) Watertight transverse bulkhead<br>a) Lower 1/3 of bulkhead<br>b) Upper 2/3 of bulkhead<br>c) Stiffeners<br>2) Two representative swash transverse bulkheads<br>a) Lower 1/3 of bulkhead<br>b) Upper 2/3 of bulkhead<br>c) Stiffeners<br>3) Three representative bays of slope plating<br>a) Lower 1/3 of tank<br>b) Upper 2/3 of tank<br>4) Longitudinals, suspect and adjacent | 1)<br>a) 5-point pattern over 1 sq. metre of plating<br>b) 5-point pattern over 1 sq. metre of plating<br>c) 5-point pattern over 1 metre length<br>2)<br>a) 5-point pattern over 1 sq. metre of plating<br>b) 5-point pattern over 1 sq. metre of plating<br>c) 5-point pattern over 1 metre length<br>3)<br>a) 5-point pattern over 1 sq. metre of plating<br>b) 5-point pattern over 1 sq. metre of plating<br>4) 5-point pattern on both web and flange over 1 metre length |
| 6. Main Deck Plating | Suspect plates and adjacent(4) | 5-point pattern over 1 sq. metre of plating |
| 7. Main Deck Longitudinals | Suspect plates | 5-point pattern on both web and flange over 1 metre length |
| 8. Web Frames/ Transverse | Suspect plates | 5-point pattern over 1 sq. metre of plating |

**Table 18 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Skin Bulk Carriers with ESP notation** (continued)

3) Structure in Double Side Spaces(including Wing Void Spaces of Ore Carriers)

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Side Shell and Inner Plating :<br>· Upper strake and strakes in way of horizontal girders<br>· All other strakes | · Plating between each pair of transverse frames/longitudinals in a minimum of three bays(along the tank)<br>· Plating between every third pair of longitudinals in same three bays | · Single measurements<br>· Single measurements |
| 2. Side Shell and Inner Side Transverse Frames/ Longitudinals on :<br>· Upper strake<br>· All other strakes | · Each transverse frame/ longitudinal in same three bays<br>· Every third transverse frame/longitudinal in same three bays | · Three measurements across web and 1 measurement on flange<br>· Three measurements across web and 1 measurement on flange |
| 3. Transverse Frames/Longitudinals Brackets | Minimum of three at top, middle and bottom of tank in same three bays | 5-point pattern over area of bracket |
| 4. Vertical Web and Transverse Bulkheads :<br>· Strakes in way of horizontal girders<br>· Other strakes | · Minimum of two webs and both transverse bulkheads<br>· Minimum of two webs and both transverse bulkheads | · 5-point patterns over approx. two square metre area<br>· Two measurements between each pair of vertical stiffeners |
| 5. Horizontal Girders | Plating on each girder in a minimum of three bays | Two measurements between each pair of longitudinal girder stiffeners |
| 6. Panel Stiffening | Where applicable | Single measurements |

4) Transverse Bulkheads in Cargo Holds

| Structural Member | Extent of Measurement | Pattern of Measurement |
|---|---|---|
| 1. Lower Stool, where fitted | · Transverse band within 25 mm of welded connection to inner bottom<br>· Transverse band within 25 mm of welded connection to shelf plate | · 5-point pattern between stiffeners over one metre length<br>· 5-point pattern between stiffeners over one metre length |
| 2. Transverse Bulkheads | · Transverse band at approximately mid height<br>· Transverse band at part of bulkhead adjacent to upper deck of below upper stool shelf plate(for those ships fitted with upper stools) | · 5-point pattern over one square metre of plating<br>· 5-point pattern over one square metre of plating |

Table 19 General Particulars *(2019)*

## GENERAL PARTICULARS

Ship's name :
IMO Number :
Class Identification number :
Port of registry :
Gross tons :
Deadweight :
Date of build :
Classification society :

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Name of firm performing thickness measurement :
Thickness measurement firm certified by :
Certificate No. :
Certificate valid from to
Place of measurement :
First date of measurement :
Last date of measurement :
Special survey/intermediate survey due :*
Details of measurement equipment :
Qualification of operator :

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Report Number : consisting of Sheets

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Name of operator :
Signature of operator :
Firm official stamp :

Name of surveyor :
Signature of surveyor :
Classification Society
Official Stamp :

* Delete as appropriate

### Table 20-1 Thickness measurements reports - Non-CSR Ships

**Table 20-1** is to be used to vessels not built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**)(i.e. Non-CSR Ships)

**TM1-T/DHT/BC/DSBC/GE***

Report on THICKNESS MEASUREMENT of ALL DECK PLATING / ALL BOTTOM SHELL PLATING / ALL SIDE SHELL PLATING*

Ship's Name : Class Identity No. : Report No. :

| STRAKE POSITION | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLATE POSITION | No. or Letter | Org. Thk. mm | Forward Reading | | | | | | Aft Reading | | | | | | Mean Diminution % | | M.A.D |
| | | | Gauged | | Diminution P | | Diminution S | | Gauged | | Diminution P | | Diminution S | | | | |
| | | | P | S | mm | % | mm | % | P | S | mm | % | mm | % | P | S | mm |
| 15th forward | | | | | | | | | | | | | | | | | |
| 14th | | | | | | | | | | | | | | | | | |
| 13th | | | | | | | | | | | | | | | | | |
| 12th | | | | | | | | | | | | | | | | | |
| 11th | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | |
| 1st | | | | | | | | | | | | | | | | | |
| Amidships | | | | | | | | | | | | | | | | | |
| 1st aft | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | |
| 11th | | | | | | | | | | | | | | | | | |
| 12th | | | | | | | | | | | | | | | | | |
| 13th | | | | | | | | | | | | | | | | | |
| 14th | | | | | | | | | | | | | | | | | |
| 15th | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of :
   All strength deck plating within the cargo (length) area
   All keel, bottom shell plating and bilge plating within the cargo (length) area
   Side shell plating including selected wind and water strakes outside cargo (length) area
   All wind and water strakes within cargo (length) area
2. The strake position is to be clearly indicated as follow :
   2.1 For strength deck indicate the number of the strake of plating inboard from the stringer plate.
   2.2 For bottom plating indicate the number of the strake of plating outboard from the keel plate.
   2.3 For side shell plating give number of the strake of plating below sheerstrake and letter as shown on shell expansion.
3. For the ships which have no wide cargo openings i.e oil tankers all deck plating strakes are to be recorded, for the ships which have wide cargo openings i.e ore/oil ships and bulk carriers only the deck plating strakes outside line of openings are to be recorded.
4. Measurements are to be taken at the forward and aft areas of all plates and where plates cross ballast and cargo tank/hold boundaries separate measurements for the area of plating in way of each type of tank/hold are to be recorded.
5. The single measurements recorded are to represent the average of multiple measurements.
6. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate
T : Oil Tankers and Chemical Tankers with ESP notation
DHT : Double Hull Oil Tankers with ESP notation
BC : Bulk Carriers with ESP notation
DSBC : Double Skin Bulk Carriers with ESP notation
GE : Others
M.A.D : Maximum Allowable Diminution

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM2-T/DHT/BC/DSBC/GE(i)***

Report on THICKNESS MEASUREMENT OF SHEERSTRAKE AND DECK PLATING AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| STRENGTH DECK AND SHEERSTRAKE PLATING | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | |
| STRAKE POSITION | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | |
| | | mm | mm | P | S | mm | % | mm | % | | mm | mm | P | S | mm | % | mm | % | | mm | mm | P | S | mm | % | mm | % |
| Stringer Plate | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1st strake inboard | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| centre strake | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| sheer strake | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOPSIDE TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Strength deck plating and sheerstrake plating transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

     (1) Strength deck plating
     (2) Stringer plate
     (3) Sheerstrake

2. For the ships which have no wide cargo openings i.e oil tankers all deck plating strakes are to be recorded, for the ships which have wide cargo openings i.e ore/oil ships and bulk carriers only the deck plating strakes outside line of openings are to be recorded.

3. The topside area comprises deck plating, stringer plate and sheerstrake (including rounded gunwales)

4. The exact frame station of measurement is to be stated.

5. The single measurements recorded are to represent the average of multiple measurements.

6. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports – Non-CSR Ships** (continued)

**TM2-T/DHT/BC/DSBC/GE(ii)***

Report on THICKNESS MEASUREMENT OF SHELL AND BOTTOM PLATING AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| SHELL AND BOTTOM PLATING | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | |
| STRAKE POSITION | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | No. or Letter | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | |
| | | mm | mm | P | S | mm | % | mm | % | | mm | mm | P | S | mm | % | mm | % | | mm | mm | P | S | mm | % | mm | % |
| 1st below sheer strake | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 18th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20th | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| keel strake | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BOTTOM TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Shell and bottom plating transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

     (1) Side shell plating
     (2) Bilge plating
     (3) Bottom shell plating
     (4) Keel plate

2. The bottom area comprises keel, bottom and bilge plating.
3. The exact frame station of measurement is to be stated.
4. The single measurements recorded are to represent the average of multiple measurements.
5. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM3-T/DHT/BC/DSBC/GE***

Report on THICKNESS MEASUREMENT OF LONGITUDINAL MEMBERS AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STRUCTURE MEMBER | Item No. | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | Item No. | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | | Item No. | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | |
| | | mm | mm | P | S | mm | % | mm | % | | mm | mm | P | S | mm | % | mm | % | | | mm | mm | P | S | mm | % | mm | % |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Longitudinal members at transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

     (1) Deck longitudinals
     (2) Deck girders
     (3) Sheerstrake longitudinals
     (4) Longitudinal bulkhead top strake
     (5) Bottom longitudinals
     (6) Bottom girders
     (7) Bilge longitudinals
     (8) Longitudinal bulkhead lower strake
     (9) Side shell longitudinals
     (10) Longitudinal bulkhead plating (remainder)
     (11) Longitudinal bulkhead longitudinals
     (12) Inner bottom plating
     (13) Inner bottom longitudinals
     (14) Topside tank sloping plating
     (15) Topside tank sloping plating longitudinals
     (16) Hopper side plating
     (17) Hopper side longitudinals
     (18) 2nd deck plating (including all lower decks)
     (19) 2nd deck plating longitudinals (including all lower decks)
     (20) 2nd deck girders (including all lower decks)
     (21) Horizontal girders in wing ballast tanks
     (22) Inner side plating
     (23) Inner side longitudinals

2. The exact frame station of measurement is to be stated.
3. The single measurements recorded are to represent the average of multiple measurements.
4. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM4-T/DHT/BC/DSBC/GE***

Report on THICKNESS MEASUREMENT OF TRANSVERSE STRUCTURAL MEMBERS
in the cargo oil and ballast tanks within the cargo tank length /
in the double bottom, hopper side and topside ballast tanks*

Ship's Name : Class Identity No. : Report No. :

TANK DESCRIPTION :

LOCATION OF STRUCTURE :

| STRUCTURAL MEMBER | ITEM | Org. Thk. (mm) | M.A.D (mm) | Gauged | | Diminution P | | Diminution S | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | P | S | mm | % | mm | % |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of transverse structural members comprising of the following structural items :

   (1) Deck transverses centre tank
   (2) Bottom transverses centre tank
   (3) Deck transverses wing tank
   (4) Side shell vertical webs
   (5) Longitudinal bulkhead vertical webs
   (6) Bottom transverses wing tank
   (7) Struts
   (8) Transverse web face plates
   (9) Doble bottom tank floors
   (10) Topside tank transverses
   (11) Hopper side tank transverses
   (12) Vertical web in wing ballast tank
   (13) Longitudinal bulkhead vertical web
   (14) Cross ties

2. The single measurements recorded are to represent the average of multiple measurements.

3. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports – Non-CSR Ships** (continued)

**TM5-T/DHT/BC/DSBC/GE***

Report on THICKNESS MEASUREMENT OF W.T/O.T TRANSVERSE BULKHEADS within the cargo tanks/holds and ballast tanks

Ship's Name : Class Identity No. : Report No. :

TANK/HOLD DESCRIPTION :

LOCATION OF STRUCTURE :

FRAME NO:

| STRUCTURAL COMPONENT (PLATING/STIFFENER) | Org. Thk. (mm) | M.A.D (mm) | Gauged | | Diminution P | | Diminution S | |
|---|---|---|---|---|---|---|---|---|
| | | | P | S | mm | % | mm | % |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of W.T / O.T transverse bulkheads or cargo hold transverse bulkheads including bulkhead stiffeners and internal stiffeners of upper and lower stools.
2. The single measurements recorded are represent the average of multiple measurements.
3. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM6-T/DHT/BC/DSBC/GE***

Report on THICKNESS MEASUREMENT OF MISCELLANEOUS STRUCTURAL MEMBERS

Ship's Name : Class Identity No. : Report No. :

| STRUCTURAL MEMBER : | | | | | | | | | SKETCH |
|---|---|---|---|---|---|---|---|---|---|
| LOCATION OF STRUCTURE : | | | | | | | | | |
| Description | Org. Thk. (mm) | M.A.D (mm) | Gauged | | Diminution P | | Diminution S | | |
| | | | P | S | mm | % | mm | % | |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of miscellaneous structural members including the following structural items :

   (1) Hatch coamings (including stiffeners)
   (2) Deck plating between hatches
   (3) Hatch covers (including stiffeners)
   (4) Inner bulkhead plating
   (5) Superstructure deck plating
   (6) Forepeak tank internal members
   (7) Aftpeak tank internal members

2. The single measurements recorded are to represent the average of multiple measurements.

3. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM8-BC/S31**

Report on THICKNESS MEASUREMENT OF CARGO HOLD SIDE SHELL FRAMES

Ship's Name : Class Identity No. : Report No. :

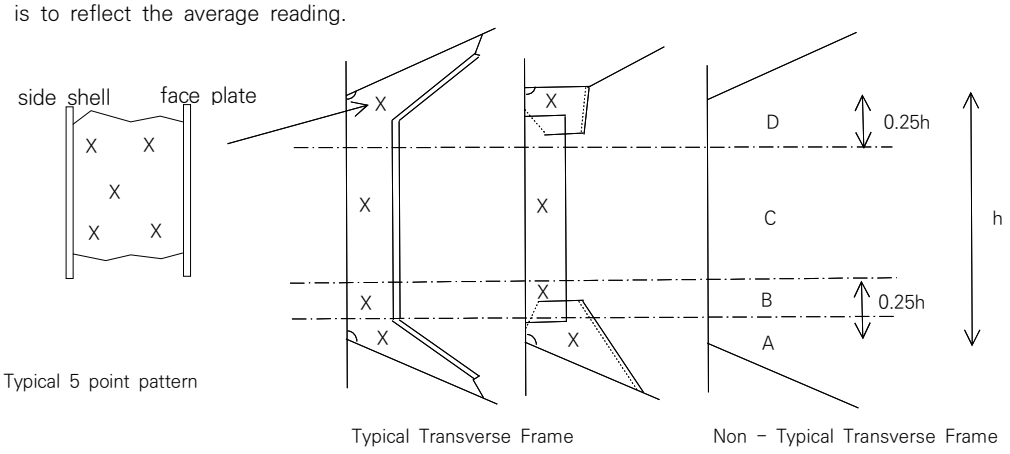
| CARGO HOLD NO. : | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ZONE A | | | | | | ZONE B | | | | | | ZONE C | | | | | | ZONE D | | | | | |
| Frame No. | Org. Thk. | $t_{REN}$ | $t_{COAT}$ | $t_M$ | Diminution | | Org. Thk. | $t_{REN}$ | $t_{COAT}$ | $t_M$ | Diminution | | Org. Thk. | $t_{REN}$ | $t_{COAT}$ | $t_M$ | Diminution | | Org. Thk. | $t_{REN}$ | $t_{COAT}$ | $t_M$ | Diminution | |
| | mm | mm | mm | mm | mm | % | mm | mm | mm | mm | mm | % | mm | mm | mm | mm | mm | % | mm | mm | mm | mm | mm | % |
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Operators Signature :

(NOTES)

1. This report is to be used for recording the thickness measurement of Cargo Hold Transverse Frames for application of UR S31

2. The gauging pattern for zones A, B & D are to be a five point pattern and for zone C may be measured by taking 3 reading over the length of zone C. If the web plating of zone C has general corrosion then it should be expanded to a five pattern. The gauging pattern is to be over the depth web and the same area vertically. The gauging report is to reflect the average reading.




Typical 5 point pattern

Typical Transverse Frame

Non - Typical Transverse Frame

**Table 20-1 Thickness measurements reports - Non-CSR Ships** (continued)

**TM7-BC/GE***

Report on THICKNESS MEASUREMENT OF CARGO HOLD TRANSVERSE FRAMES

Ship's Name : Class Identity No. : Report No. :

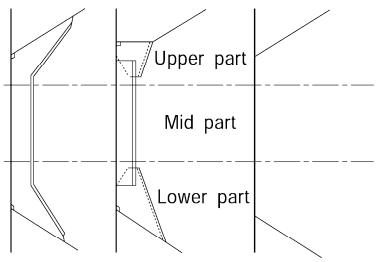
| CARGO HOLD NO. : | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UPPER PART | | | | | | | | MID PART | | | | | | | | LOWER PART | | | | | | | |
| FRAME NUMBER | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | | Org. Thk. | M.A.D | Gauged | | Diminution P | | Diminution S | |
| | mm | mm | P | S | mm | % | mm | % | mm | mm | P | S | mm | % | mm | % | mm | mm | P | S | mm | % | mm | % |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of :
   Cargo hold transverse frames or diaphragms

2. The location and pattern of measurements is to be indicated on the sketches of hold frames shown below.




Typical transvers frames in cargo hold Thickness gauging area

Non-typical transverse frames in cargo hold Thickness gauging area

3. The single measurements recorded are to represent the average of multiple measurements.

4. The maximum allowable diminution could be stated in an attached document.

* : delete as appropriate

## Table 20-2 Thickness measurements reports - CSR Ships

**Table 20-2** is to be used to vessels built under IACS Common Structural Rules(**Pt 11**, **Pt 12** or **Pt 13**)(i.e. CSR Ships)

**TM1-DHT/BC/DSBC*(CSR)**

Report on THICKNESS MEASUREMENT of ALL DECK PLATING / ALL BOTTOM PLATING / ALL SIDE SHELL PLATING*

Ship's Name : Class Identity No. : Report No. :

| STRAKE POSITION | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLATE POSITION | No. or Letter | As Built Thk. mm | Voluntary Thickness Addition mm | Renewal Thickness mm (a) | Forward Reading | | | | | | Aft Reading | | | | | | Mean Remaining Corr. Addition, mm [(c1)+(c2)]/2 | |
| | | | | | Gauged Thk. mm (b1) | | Remaining Corr. Addition, mm (c1)=(b1)-(a) | | | | Gauged Thk. mm (b2) | | Remaining Corr. Addition, mm (c2)=(b2)-(a) | | | | | |
| | | | | | P | S | P | | S | | P | S | P | | S | | P | S |
| 15th forward | | | | | | | | | | | | | | | | | | |
| 14th | | | | | | | | | | | | | | | | | | |
| 13th | | | | | | | | | | | | | | | | | | |
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| 7th | | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | |
| 1st | | | | | | | | | | | | | | | | | | |
| Amidships | | | | | | | | | | | | | | | | | | |
| 1st aft | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | |
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| 15th | | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of :

   All strength deck plating within the cargo (length) area
   All keel, bottom shell plating and bilge plating within the cargo (length) area
   Side shell plating including selected wind and water strakes outside cargo (length) area
   All wind and water strakes within cargo (length) area

2. The strake position is to be clearly indicated as follow :
   2.1 For strength deck indicate the number of the strake of plating inboard from the stringer plate.
   2.2 For bottom plating indicate the number of the strake of plating outboard from the keel plate.
   2.3 For side shell plating give number of the strake of plating below sheerstrake and letter as shown on shell expansion.

3. For BC/DSBC(CSR), only the deck plating strakes outside line of openings are to be recorded.

4. Measurements are to be taken at the forward and aft areas of all plates and where plates cross ballast and cargo tank/hold boundaries separate measurements for the area of plating in way of each type of tank/hold are to be recorded.

5. The single measurements recorded are to represent the average of multiple measurements.

6. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate
DHT : Double Hull Oil Tankers with ESP notation
BC : Bulk Carriers with ESP notation
DSBC : Double Skin Bulk Carriers with ESP notation

**Table 20-2 Thickness measurements reports – CSR Ships** (continued)

**TM2-DHT/BC/DSBC*(CSR)(i)**

Report on THICKNESS MEASUREMENT OF SHEERSTRAKE AND DECK PLATING AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| STRENGTH DECK AND SHEERSTRAKE PLATING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | |
| STRAKE POSITION | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | |
| | | | | | P | S | P | | S | | | | | | P | S | P | | S | | | | | | P | S | P | | S | |
| Stringer Plate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1st strake inboard | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| centre strake | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| sheer strake | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOPSIDE TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Strength deck plating and sheerstrake plating transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

     (1) Strength deck plating
     (2) Stringer plate
     (3) Sheerstrake

2. For BC/DSBC(CSR), only the deck plating strakes outside line of openings are to be recorded.
3. The topside area comprises deck plating, stringer plate and sheerstrake (including rounded gunwales)
4. The exact frame station of measurement is to be stated.
5. The single measurements recorded are to represent the average of multiple measurements.
6. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports – CSR Ships** (continued)

**TM2-DHT/BC/DSBC*(CSR)(ii)**

Report on THICKNESS MEASUREMENT OF SHELL AND BOTTOM PLATING AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| SHELL AND BOTTOM PLATING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | |
| STRAKE POSITION | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | |
| | | | | | P | S | P | | S | | | | | | P | S | P | | S | | | | | | P | S | P | | S | |
| 1st below sheer strake | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2nd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 15th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20th | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| keel strake | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BOTTOM TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Shell and bottom plating transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

     (1) Side shell plating
     (2) Bilge plating
     (3) Bottom shell plating
     (4) Keel plate

2. The bottom area comprises keel, bottom and bilge plating.

3. The exact frame station of measurement is to be stated.

4. The single measurements recorded are to represent the average of multiple measurements.

5. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports – CSR Ships** (continued)

**TM3-DHT/BC/DSBC*(CSR)**

Report on THICKNESS MEASUREMENT OF LONGITUDINAL MEMBERS AT TRANSVERSE SECTIONS
(one, two or three transverse sections)

Ship's Name : Class Identity No. : Report No. :

| STRUCTURE MEMBER | FIRST TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | SECOND TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | | THIRD TRANSVERSE SECTION AT FRAME NUMBER : | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | No. or Letter | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | |
| | | | | | P | S | P | | S | | | | | | P | S | P | | S | | | | | | P | S | P | | S | |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of :
   - Longitudinal members at transverse sections :
     One, two or three sections within the cargo (length) area comprising of the following structural items :

   For DHT(CSR)

   (1) Deck longitudinals
   (2) Sheerstrake longitudinals
   (3) Side shell longitudinals
   (4) Bilge longitudinals
   (5) Bottom longitudinals
   (6) Deck girders
   (7) Horizontal girders in wing ballast tanks
   (8) Bottom girders
   (9) Longitudinal bulkhead top strake
   (10) Longitudinal bulkhead bottom strake
   (11) Longitudinal bulkhead plating (remainder)
   (12) Longitudinal bulkhead longitudinals
   (13) Inner side plating
   (14) Inner side longitudinals
   (15) Hopper plating
   (16) Hopper longitudinals
   (17) Inner bottom plating
   (18) Inner bottom longitudinals
   (19) Topside tank plating
   (20) Topside tank longitudinals

   For BC/DSBC(CSR)

   (1) Deck longitudinals
   (2) Deck girders
   (3) Sheerstrake longitudinals
   (4) Topside tank sloping plate
   (5) Topside tank sloping plate longitudinals
   (6) Bottom longitudinals
   (7) Bottom girders
   (8) Bilge longitudinals
   (9) Side shell longitudinals, if any
   (10) Inner bottom plating
   (11) Inner bottom longitudinals
   (12) Hopper plating
   (13) Hopper longitudinals
   (14) Inner side plating
   Inner side longitudinals, if any
   Horizontal girders in wing ballast tanks

2. The exact frame station of measurement is to be stated.
3. The single measurements recorded are to represent the average of multiple measurements.
4. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports – CSR Ships** (continued)

**TM4-DHT/BC/DSBC*(CSR)**

Report on THICKNESS MEASUREMENT OF TRANSVERSE STRUCTURAL MEMBERS
in the cargo oil and ballast tanks within the cargo tank length /
in the double bottom, hopper side and topside ballast tanks*

Ship's Name : Class Identity No. : Report No. :

TANK DESCRIPTION :

LOCATION OF STRUCTURE :

| STRUCTURAL MEMBER | ITEM | As Built Thickness mm | Voluntary Thickness Addition mm | Renewal Thickness mm (a) | Gauged Thickness mm (b) | | Remaining Corr. Addition mm (b)-(a) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurements of transverse structural members comprising of the following structural items :

   For DHT(CSR)

   (1) Deck transverses – centre tank
   (2) Deck transverses – wing tank
   (3) Vertical web in wing ballast tank
   (4) Doble bottom floors – wing tank
   (5) Doble bottom floors – centre tank
   (6) Longitudinal bulkhead vertical webs
   (7) Cross ties

   For BC/DSBC(CSR)

   (1) Doble bottom tank floors
   (2) Topside tank transverses
   (3) Hopper side tank transverses
   (4) Transverse web frame
   Ordinary transverse frame in double skin tank

2. The single measurements recorded are to represent the average of multiple measurements.
3. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports - CSR Ships** (continued)

**TM5-DHT/BC/DSBC*(CSR)**

Report on THICKNESS MEASUREMENT OF W.T/O.T TRANSVERSE BULKHEADS within the cargo tanks/holds and ballast tanks

Ship's Name : Class Identity No. : Report No. :

TANK/HOLD DESCRIPTION :

LOCATION OF STRUCTURE :

FRAME NO:

| STRUCTURAL COMPONENT (PLATING/STIFFENER) | As Built Thickness mm | Voluntary Thickness Addition mm | Renewal Thickness mm (a) | Gauged Thickness mm (b) | | Remaining Corr. Addition mm (b)-(a) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | P | S | P | | S | |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of W.T / O.T transverse bulkheads within the cargo tanks/holds and ballast tanks including bulkhead stiffeners and internal stiffeners of upper and lower stools
2. The single measurements recorded are represent the average of multiple measurements.
3. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column.
   If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports - CSR Ships** (continued)

**TM6-DHT/BC/DSBC*(CSR)**

Report on THICKNESS MEASUREMENT OF MISCELLANEOUS STRUCTURAL MEMBERS

Ship's Name : Class Identity No. : Report No. :

| STRUCTURAL MEMBER : | | | | | | | | | | SKETCH |
|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION OF STRUCTURE : | | | | | | | | | | |
| Description | As Built Thk. mm | Voluntary Thickness Addition mm | Renewal Thickness mm (a) | Gauged Thickness mm (b) | | Remaining Corr. Addition mm (b)-(a) | | | | |
| | | | | P | S | P | | S | | |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of miscellaneous structural members including the following structural items :
   (1) Hatch coamings (including stiffeners)
   (2) Deck plating between hatches
   (3) Hatch covers (including stiffeners)
   (4) Inner bulkhead plating
   (5) Superstructure deck plating
   (6) Forepeak tank internal members
   (7) Aftpeak tank internal members
2. The single measurements recorded are to represent the average of multiple measurements.
3. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

* : delete as appropriate

**Table 20-2 Thickness measurements reports - CSR Ships** (continued)

**TM7-BC(CSR)**

Report on THICKNESS MEASUREMENT OF CARGO HOLD TRANSVERSE FRAMES

Ship's Name : Class Identity No. : Report No. :

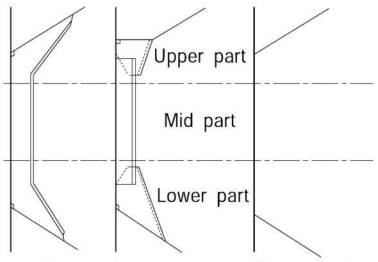
| CARGO HOLD NO. : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UPPER PART | | | | | | | | | MID PART | | | | | | | | | LOWER PART | | | | | | | | | | |
| FRAME NUMBER | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | | As Built Thk. mm | Vol. Thk. Add. mm | Ren. Thk. mm (a) | Gauged Thk. mm (b) | | Remaining Corr. Addition, mm (b)-(a) | | | |
| | | | | P | S | P | | S | | | | | P | S | P | | S | | | | | P | S | P | | S | | | |
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Operators Signature :

(NOTES)

1. This report form is to be used for recording the thickness measurement of :
   Cargo hold transverse frames or diaphragms

2. The location and pattern of measurements is to be indicated on the sketches of hold frames shown below.




Typical transvers frames in cargo hold Thickness gauging area

Non-typical transverse frames in cargo hold Thickness gauging area

3. The single measurements recorded are to represent the average of multiple measurements.

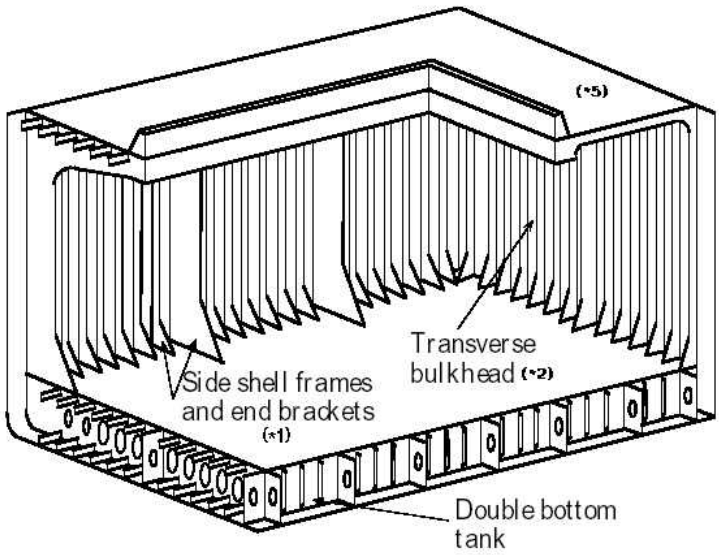
4. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way shall be renewed, and the mark "R" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way shall be additional gauged, and the mark "S" is to be indicated in the right-hand column.

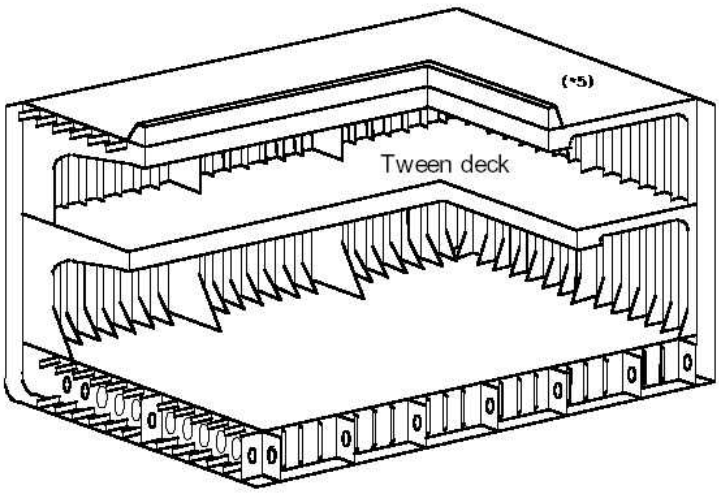
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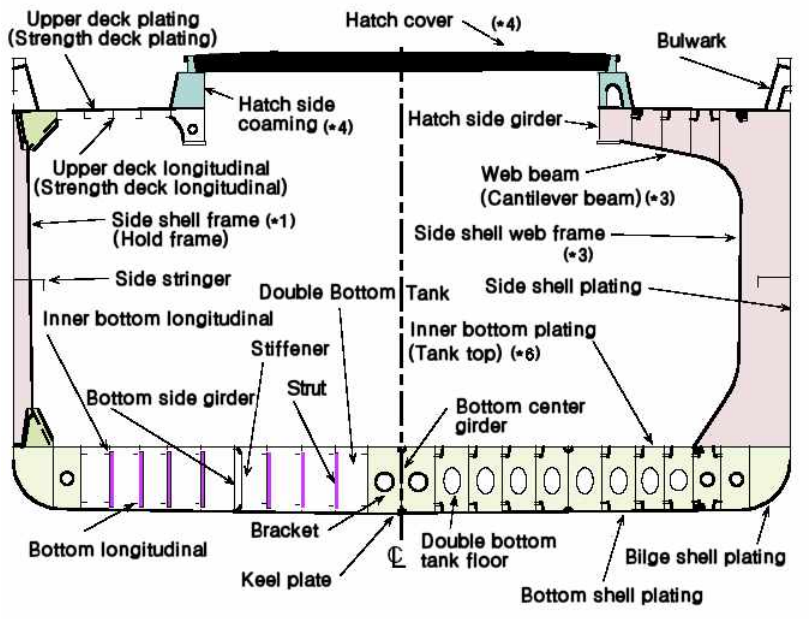
# Annex 1-6 Areas of Close-up Survey, etc.

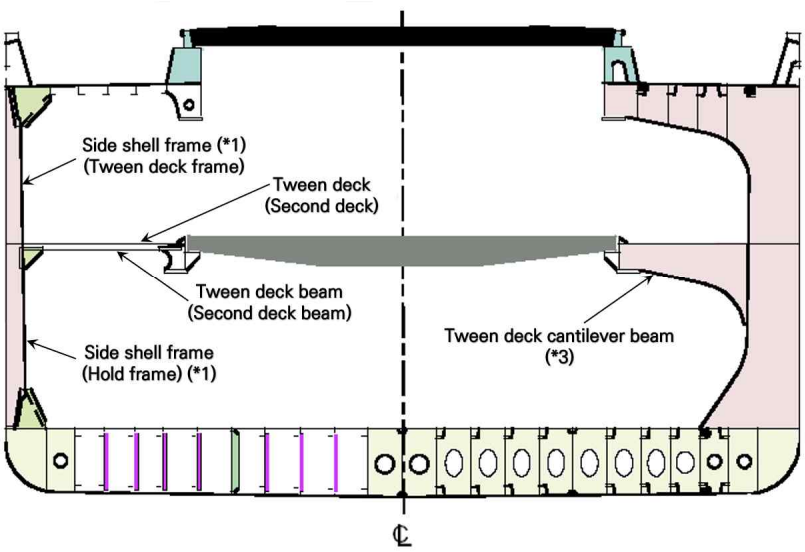
**1.** Guidance for areas of Close-up Survey for General Dry Cargo Ships, Bulk Carriers, Oil Tankers, Chemical Tankers, Double Hul Oil Tankers and Double Skin Bulk Carriers specified in **Table 1.2.8, Table 1.3.1, Table 1.3.4**, **Table 1.3.7, Table 1.3.10** and **Table 1.3.13** of the Rules are indicated on the diagrams as follows.

(1) Areas of Close-up Survey for General Dry Cargo Ships



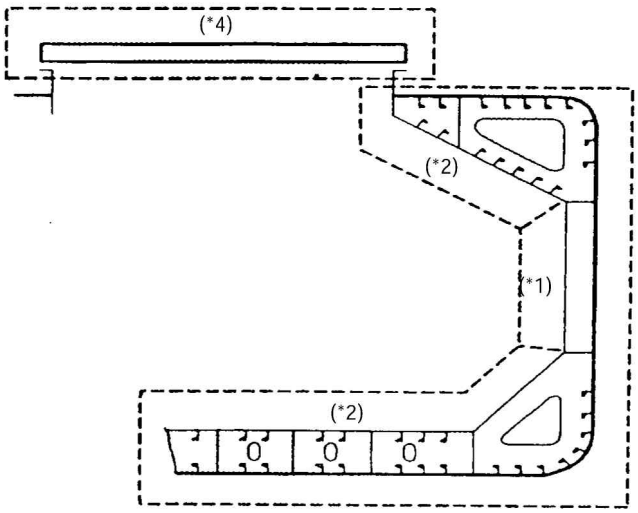


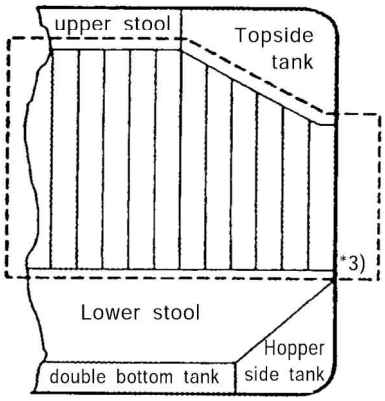

Note : (*1) through (*6) are as given in **Table 1.2.8** of the Rules

(2) Areas of Close-up Survey for Bulk Carriers with ESP notation *(2019)*

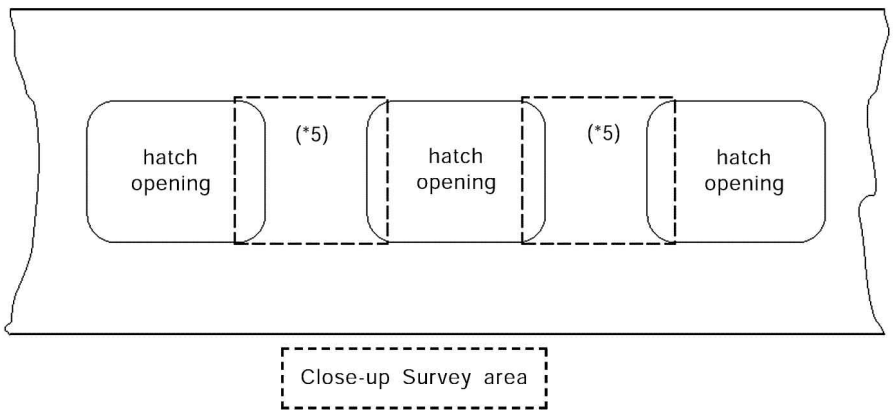
(Typical transverse section)




(Cargo hold, transverse bulkhead)



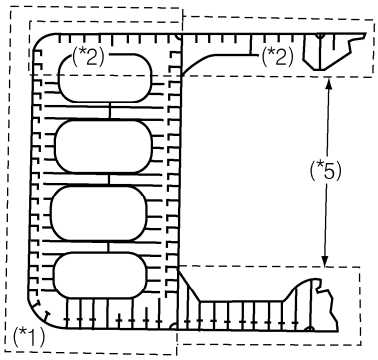

(Typical areas of deck plating inside line of hatch openings between cargo hold hatches)



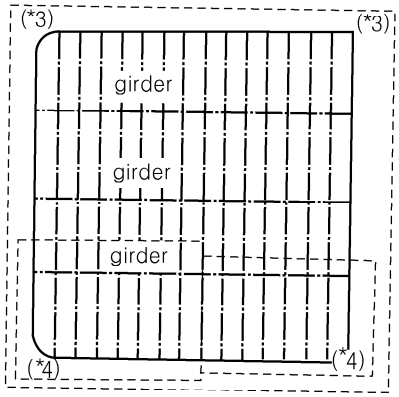

Note : (*1) through (*5) are as given in **Table 1.3.1** of the Rules.

(3) Areas of Close-up Survey for Oil Tankers with ESP notation

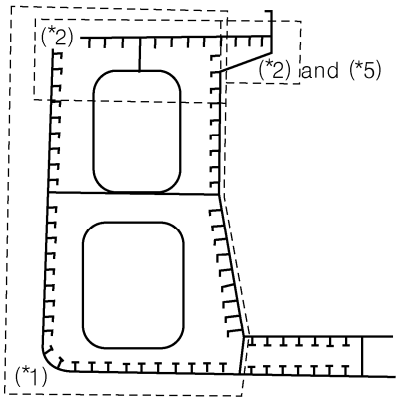
Oil Tanker
(Typical transverse section)



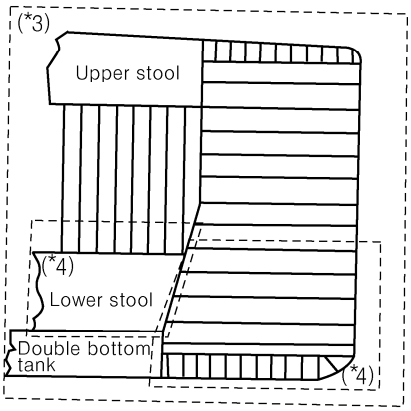

Oil Tanker
(Typical transverse bulkhead)




Ore/Oil Ship
(Typical transverse section)



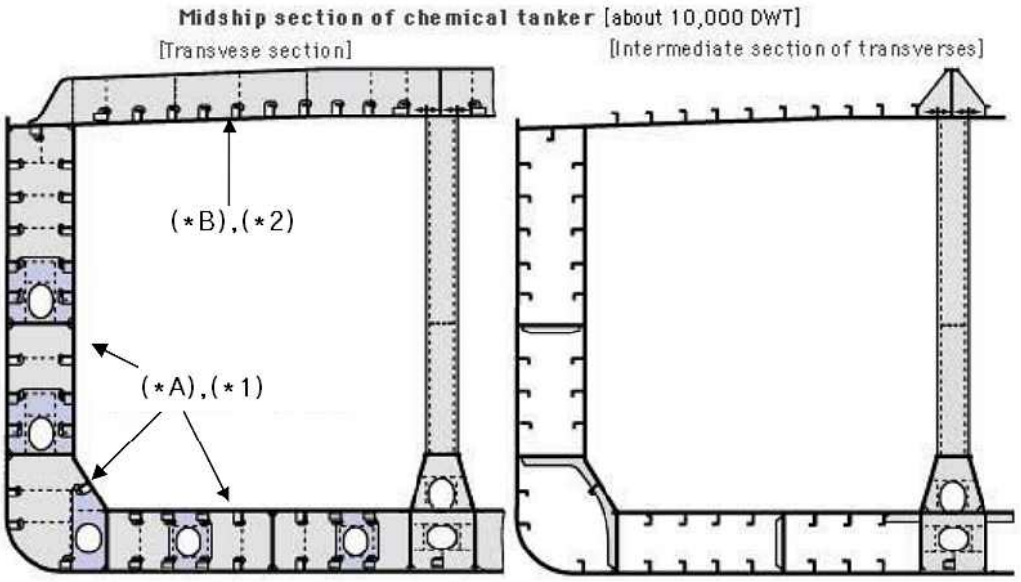

Ore/Oil Ship
(Typical transverse bulkhead)

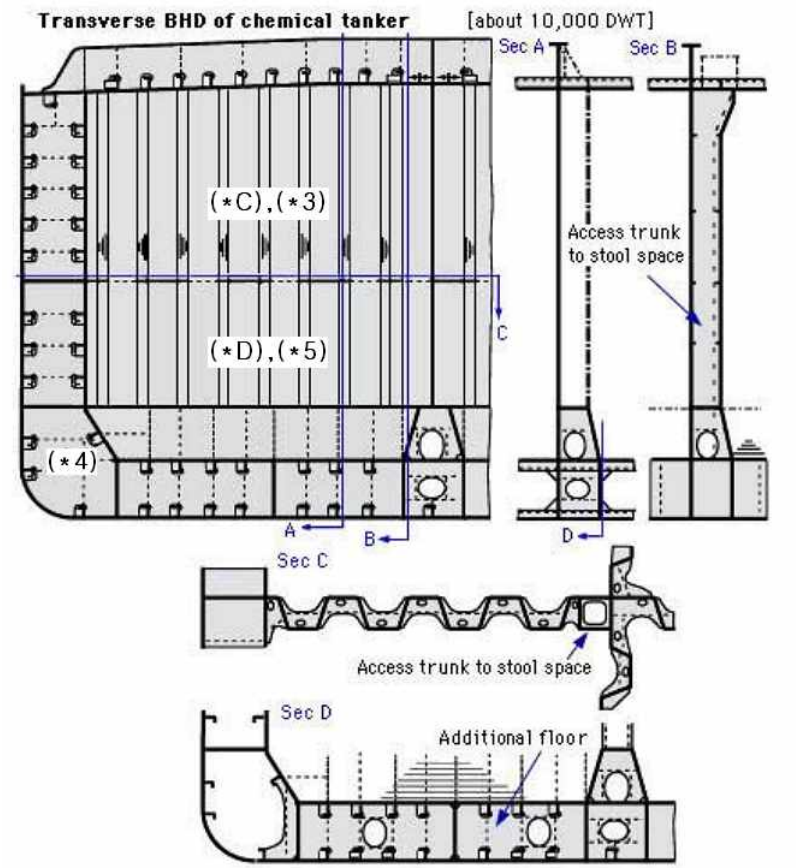


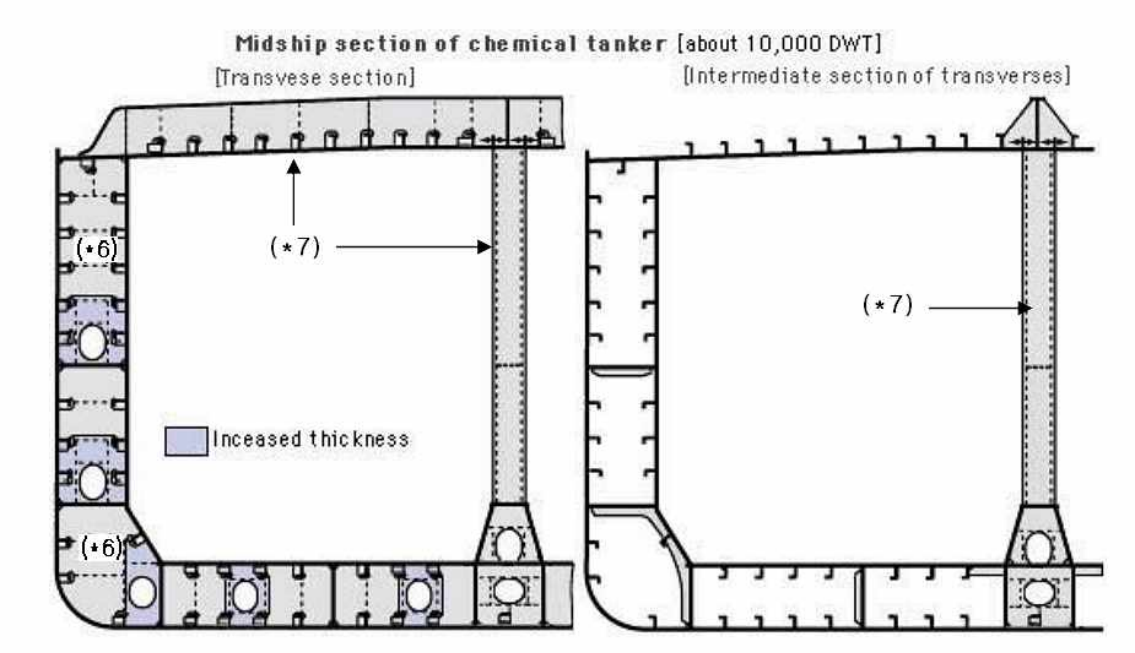

Close-up Survey area

Note : (*1) through (*5) are as given in **Table 1.3.4** of the Rules.

(4) Areas of Close-up Survey for Chemical Tankers with ESP notation

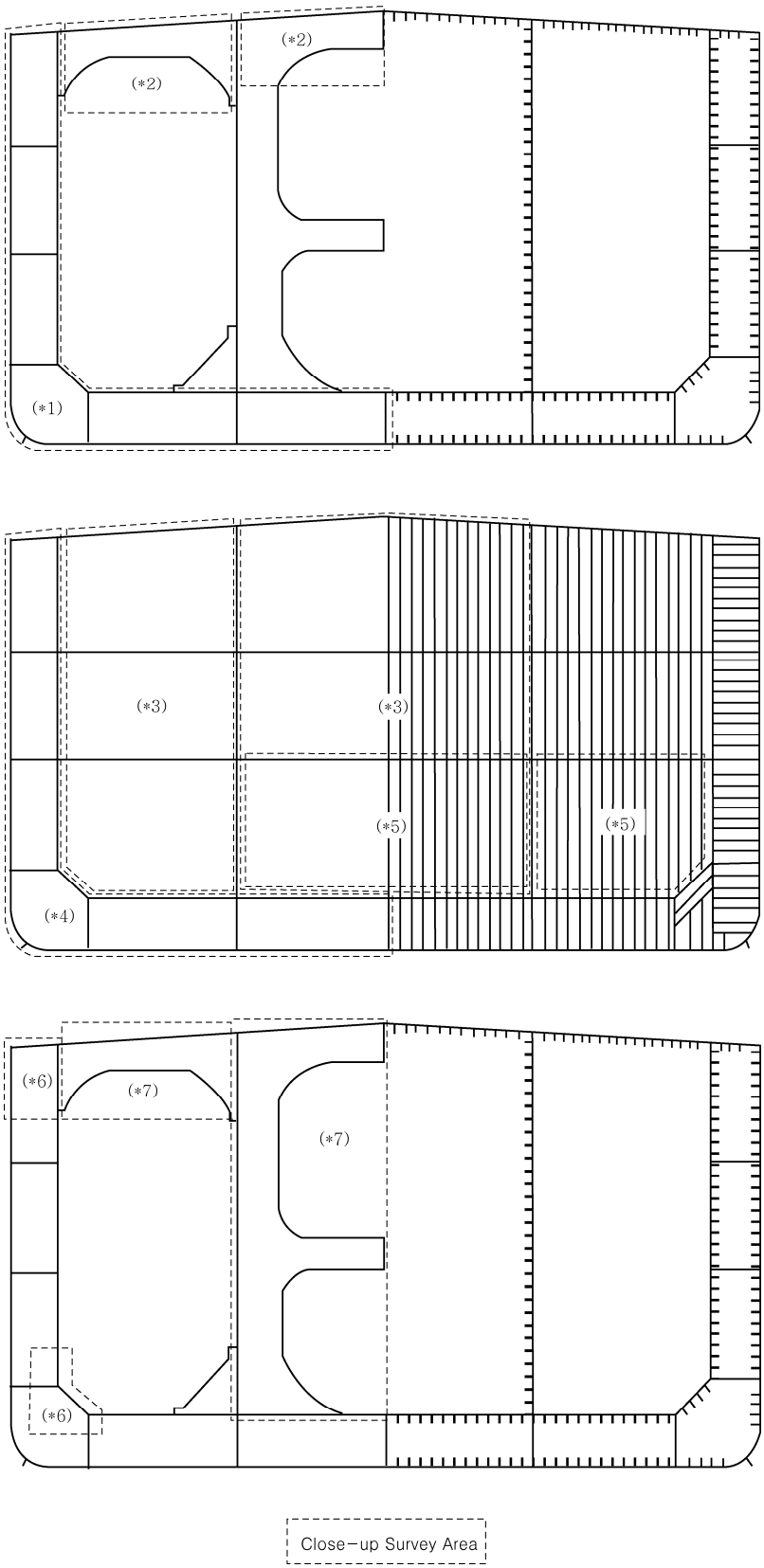





Note : (*1) through (*7) and (*A) through (*D) are as given in **Table 1.3.7** of the Rules.

(5) Areas of Close-up Survey for Double Hull Oil Tankers with ESP notation

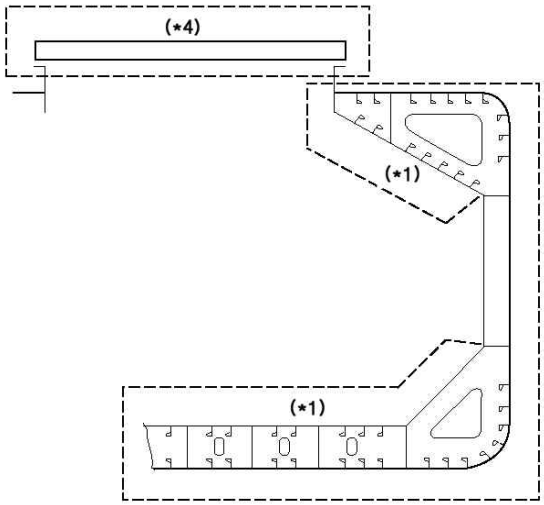



Note : (*1) through (*7) are as given in **Table 1.3.10** of the Rules.

(6) Areas of Close-up Survey for Double Skin Bulk Carriers with ESP notation

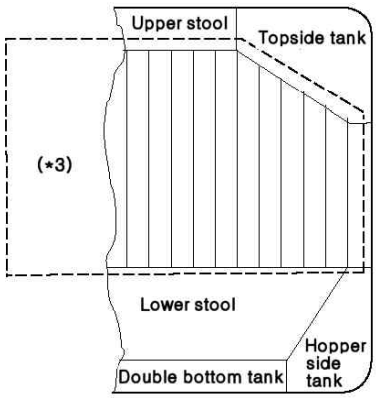
Typical transverse section

**Areas (*1) and (*4)**



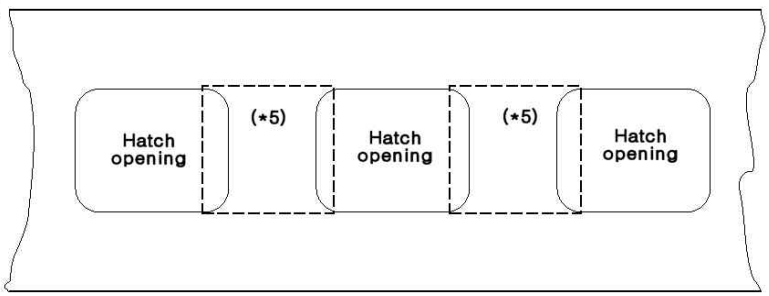

A cargo hold, transverse bulkhead

**Area (*3)**



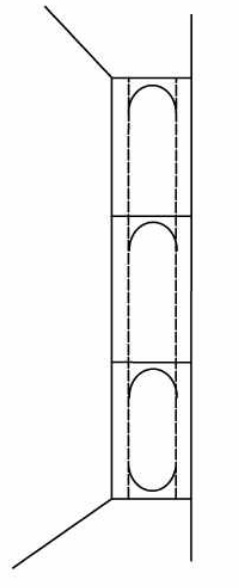

Typical areas of deck plating and underdeck structure inside line of hatch openings between cargo hold hatches

**Area (*5)**

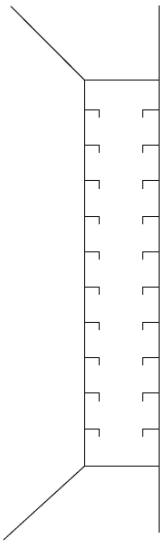


Area(＊2)

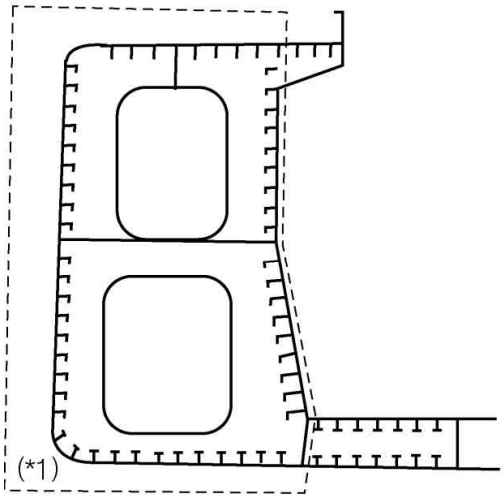
Ordinary transverse frame in double skin tank



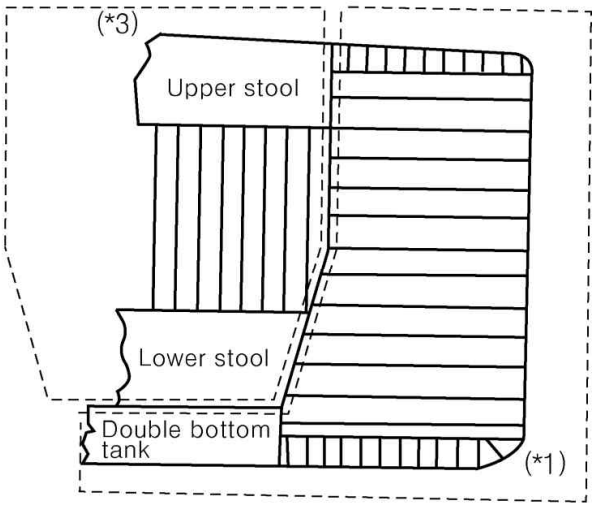
Ordinary longitudinal structure in double skin tank



Typical transverse section



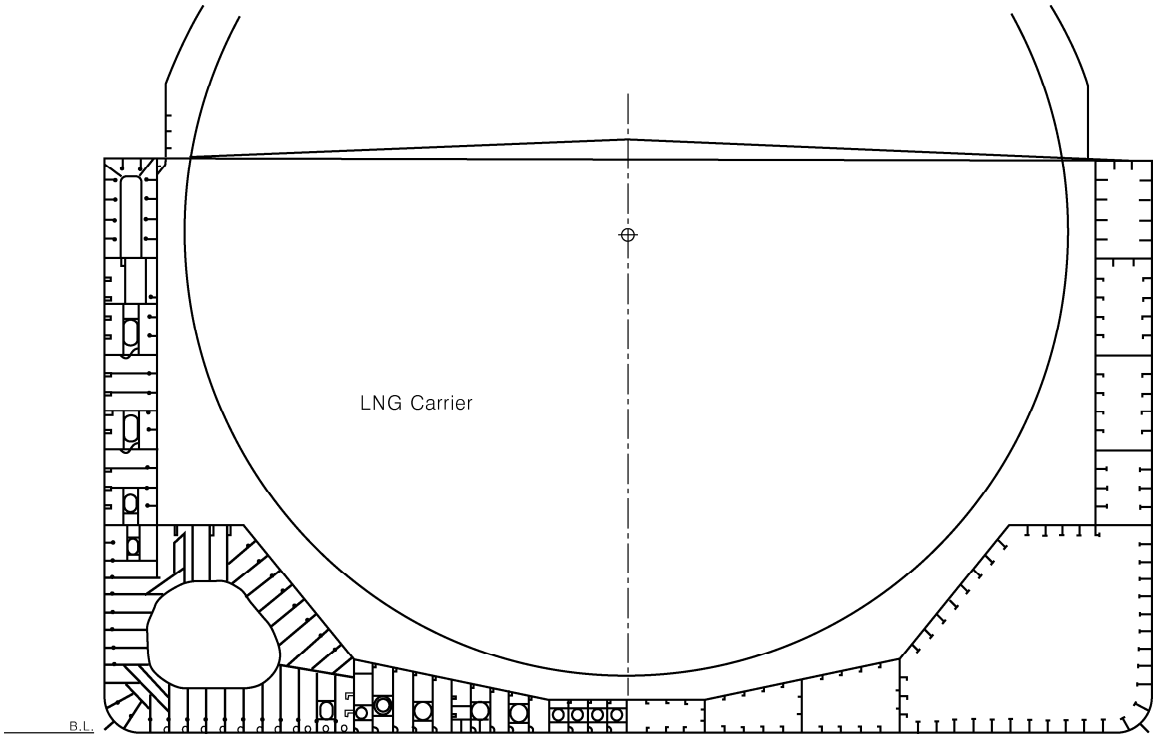

Typical transverse bulkhead

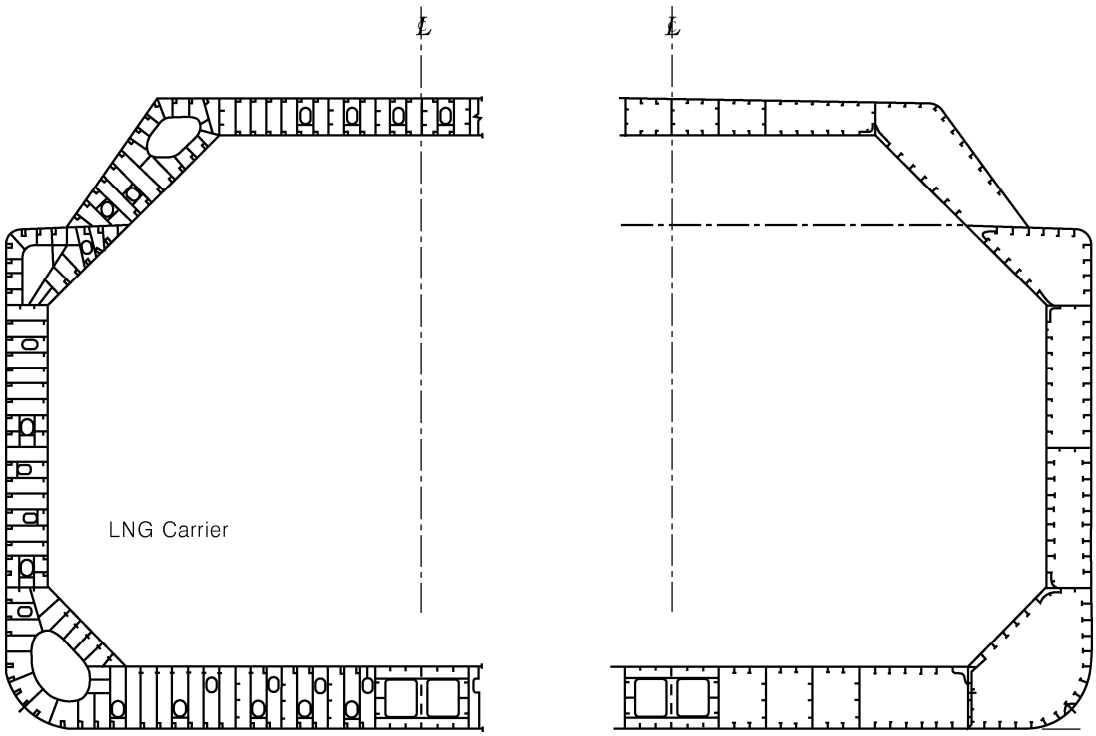


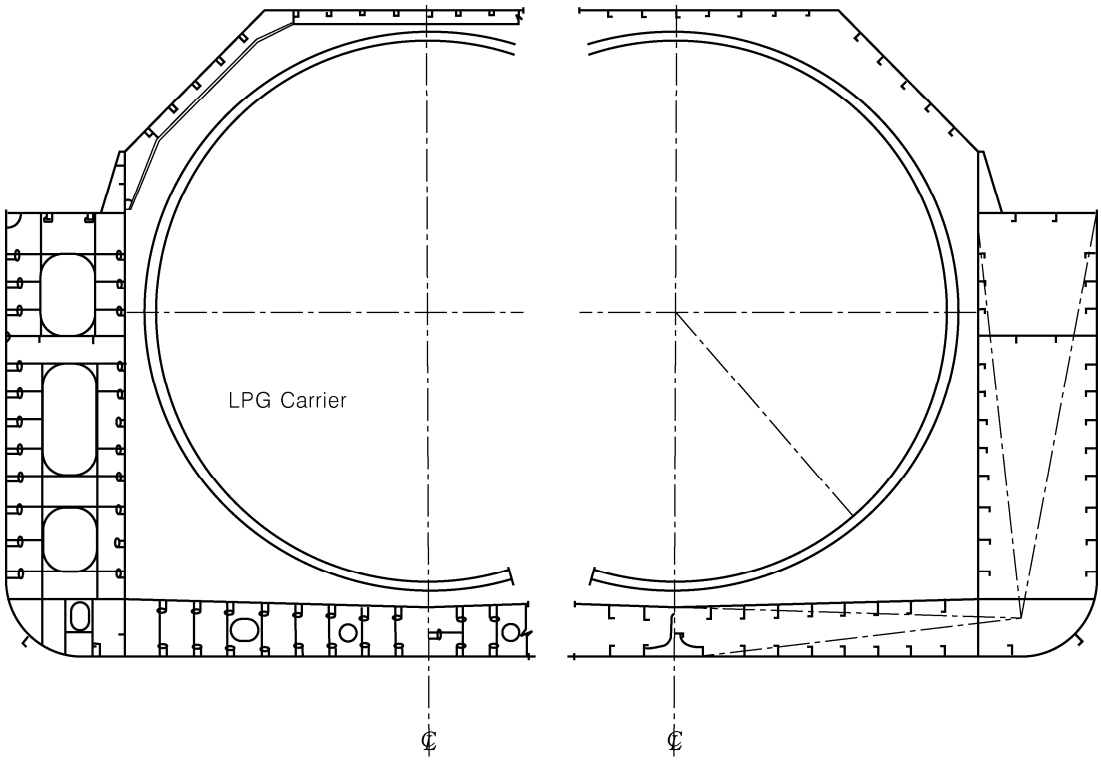

Close-up Survey area

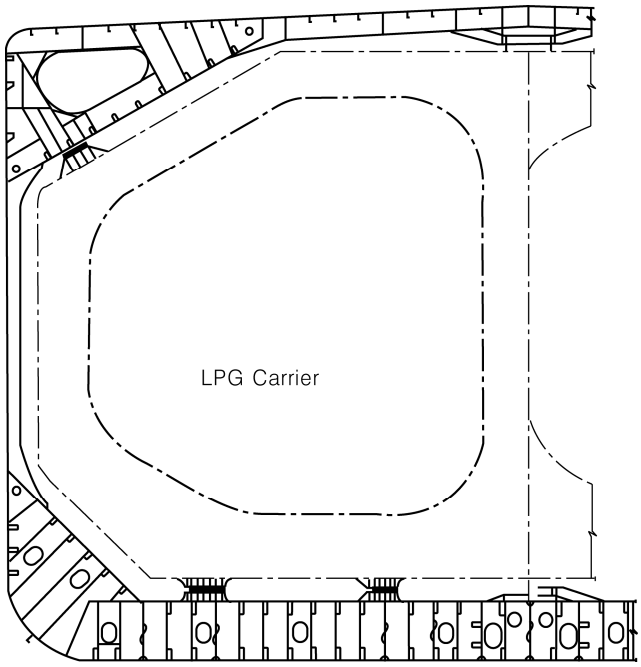
Note : (*1) through (*5) are as given in **Table 1.3.13** of the Rules

2. The typical midship sections of liquefied gas carriers specified in **Table 1.2.10** of the Rules are indicated on the diagrams as follows.




LPG Carrier
℄
℄


LPG Carrier

# Annex 1-7 Continuous Machinery Survey Procedure(CMS)

## 1. Application of CMS *(2025)*

(1) Where the CMS system is intended to be applied, the Shipowner applies for "CMS". The CMS system, in principle, is applied to machinery installation items of established type. However, the CMS system is not to be applied to non-propelled vessels unless special consideration is given by the Society.

(2) The Society is to prepare the CMS status, thereafter. the CMS status is to be forwarded from the Head Office to the Shipowner after the completion of CMS. The CMS up-date status is to be kept on board for reference by the attending Surveyor.
(A) In principle, all items for CMS are to be included in the programme.
(B) Consecutive survey intervals of each item are not to exceed 5 years. And all items are to be examined in rotation.
(C) Preferably, open-up schedules of machinery installations are to be checked to enable the attending Surveyor to evaluate the condition of the whole system from the open-up results of any survey.
(D) In cases where the ship's maintenance programme is modified in the process of implementation, the CMS programme on board may be partially or wholly amended.
(E) CMS status is to be confirmed by referring to the drawings (ex.Arragnement of machnery, Piping diagram in E/R, Hull)

(3) Items covered by the CMS system are, in principle, those shown in **Table 1** of the Guidance.

(4) In principle, it is preferable to conduct the open-up survey of essential auxiliaries(normally provided in duplicate or more) alternately at similar intervals. However, the surveys of diesel engines driving generators and bilge pumps is to be conducted, as far as practicable, simultaneous with the Special Survey or Intermediate Survey.

(5) When defects are found on a part during survey, a thorough examination may be required on other similar parts of machinery installations.

## 2. Confirmatory Survey for CMS inspected by the Chief Engineer

(1) Qualification of Chief Engineer

(A) The Chief Engineer is to have sailing experience of at least 3 years as a chief engineer or be certified as a first-grade engineer by the relevant government and
(B) The Chief Engineer has at least 1 year sailing experience on a ship installed with a similar type of propulsion engine(internal combustion engine or steam turbine for main propulsion).

(2) Where CMS permissible for the Chief Engineer's inspection are as given in **Table 2** were overhauled (or open up) at sea and inspected by the Chief Engineer in routine maintenance works, the inspections may be accepted for the CMS. Whenever such an inspection was carried out by the Chief Engineer during the ship's stay in port(where the attendance of the Society's Surveyor is not easily available), the same process as above is applicable.

(3) The confirmatory survey by the Surveyor, in principle, is to be carried out by the timing of next periodical survey under the attending Surveyor as follows,

(A) inspection of operational condition.
(B) reviewing relevant details of the engine log book or maintenance record(e.g. acceptable computer outputs) and hears the Chief Engineer's opinion. If review of the relevant log book and checking of oil and oil filter conditions indicate they are in good working condition, these may substitute for the open up survey of machinery installations listed below. Substitute items are to be recorded in the survey report.

(a) Oil pumps(excluding cargo oil pumps) and oil heaters
(b) Hydraulic pumps and motors for deck machinery
(c) Oil tanks (having a capacity of 1 $m^3$ or less)

(C) Reporting submitted by the Chief Engineer including following contents
(a) Signature and license number of the Chief Engineer

(b) Inspection date and place
(c) Inspection items and results.

(D) If necessary, the attending Surveyor may request the overhauling(or open-up) survey of relevant machinery according to the results of the Confirmatory Survey.

### 3. Unification of names and numbers for CMS items

(1) If there are items of CMS used for same purpose each ship, their names are to be unified in accordance with **Table 3**.

(2) For items of CMS used for same purpose are provided in duplicate or more on board, if their serial numbers are not assigned or uncertain, it is recommended for shipyard or shipowner to assign as belows, however, at existing ship the serial numbers of CMS are to be identified with ones attached to name plates or using name on board.

(A) Numbering from Starboard to Port
(B) Numbering from Fore to After.
(C) Numbering from Upper to Lower.

(3) In case ships not applied to the CMS, (2) above may be applied to.

**Table 1 Items Covered by the CMS System**

| Items | Details |
|---|---|
| 1. Internal combustion engines for main engines | (a) Cylinder covers, cylinder liners, pistons (including piston pins and piston rods), crossheads (including pins, bearings and guides), connecting rods, crank shafts and bearings, camshafts and their driving gears, turbo chargers, scavenge air pumps or blowers, air intercoolers, attached essential pumps (bilge, lubricating oil, fuel oil and cooling water) |
| 2. Steam turbines for main engines | (a) Turbine rotors, blades, bearings, casings, nozzles, nozzle valves and maneuvering valves |
| 3. Power transmission systems and shafting systems | (a) Reduction gears, reversing gears, clutches and flexible couplings<br>(b) Intermediate shafts, thrust shafts and their bearings |
| 4. Auxiliary engines | (a) Auxiliary engines driving generators (excluding emergency generators) or auxiliary essential machinery are to be handled in accordance with the requirements applicable to main engines. |
| 5. Auxiliary machinery | (a) Air compressors and blowers: main and auxiliary starting air compressors (excluding those for emergency use), air compressors for control system, forced draft fans for main boilers, gas compressors and gas blowers<br>(b) Pumps for essential uses:<br>- Cooling fresh water pumps, cooling sea water pumps, fuel oil pumps and lubricating oil pumps for main and auxiliary engines<br>- Fuel oil pumps, feed water pumps and water circulating pumps for main boilers<br>- Feed water pumps and water circulating pumps for auxiliary boilers<br>- Thermal oil pumps- Condensing pumps for main engine<br>- Sea water service pumps<br>- Lubricating oil pumps for reduction gears<br>- Lubricating oil pumps for stern tubes<br>- Hydraulic oil pumps for controllable pitch propellers<br>- Hydraulic oil pumps for steering gears<br>- Hydraulic oil pumps for windlass and mooring winches<br>- Bilge pumps (excluding those for oil separators), ballast pumps and fire pumps (excluding emergency fire pumps)<br>- Cargo oil pumps (including chemical pumps and liquefied gas pumps), stripping pumps, spray pumps and tank cleaning pumps<br>(c) Windlass and mooring winches<br>(d) Cargo refrigerating installations (excluding those for provision storage): compressors, pumps, evaporators and condensers<br>(e) Fresh water generators for main boilers<br>(f) Heaters, coolers and condensers for essential services *(2023)*<br>- Fuel oil heaters (excluding those for purifiers) and tank cleaning heaters<br>- Condensers and feed water heaters<br>- Coolers (excluding those for air compressors)<br>- Cargo heat exchangers<br>(g) Inert gas systems<br>(h) Exhaust gas Emission Abatement system(SCR, EGR & EGCS)<br>- Pump, exhaust fan, blower, reductant or chemical storage tank and residue tank and inside of SCR chamber & scrubber.<br>(i) Air reservoirs (excluding those for emergency use) and other pressure vessels for essential uses<br>(j) Fuel oil tanks not form a part of the ship's structure<br>(k) Other items considered to be applicable under the CMS by the Society |

Table 2 Machinery Permissible for the Chief Engineers Inspection, etc. *(2022)*

| | Items | Remarks |
|---|---|---|
| Machinery permissible for the Chief Engineers inspection | 1. Internal combustion engines for main engines *(2023)*<br>2. Auxiliary diesel engine(Refer to remarks)<br>3. Forced draft fans & burning pumps for main boiler<br>4. Auxiliary machinery<br>(1) Air compressor<br>(2) Auxiliary blower<br>(3) Pump<br>(4) Heat exchanger<br>(5) Portable fuel oil tank<br>(6) Fresh water generator<br>(7) Deck machinery<br>(8) Hydraulic pumps of steering gears<br>(9) Exhaust gas emission abatement system (SCR, EGR & EGCS)<br>5. Among items Covered by the CMS System in Table 1, items not designated machinery impermissible for the Chief Engineers inspection *(2023)*<br>※ However, for ships subject to Korean Ship Safety Act, each part of the main internal combustion engine and internal combustion engine to drive main generator among machinery permissible for the Chief Engineer's inspection, open-up survey by the Surveyor for at least one of two CMS cycles is to be carried. | ● The Chief Engineer's inspection for auxiliary diesel engines<br>● The engine is completely opened up and a careful examination is made on all cylinder units, cylinder liners, cylinder covers, cylinder cover valves, pistons, piston rings, connecting rods and top and lower bearings, piston pins, camshaft driving gears, turbo-chargers, air-in-tercoolers, crankcase and crankcase doors, engine foundation bolts, and crank case safety valves.<br>● The top halves of all main bearings are removed and two bottom halves are taken out for examination.<br>● An examination is made on all crankpins and journals to detect cracks, especially at fillet and areas in the vicinity of oil holes and crank shaft oil grooves.<br>● Crank web deflections are measured and recorded.<br>● Wear downs of the cylinder liners are measured and recorded.<br>● The L.O. cooler attached to the engine, L.O. pumps, cooling water pumps, etc. of direct driven-type are opened up and examined.<br>● Verify through performance tests that safety devices are in good operating condition.<br>● The service hours of crank pin bolts are checked and recorded. |
| Machinery impermissible for the Chief Engineers inspection | 1. Crank shaft, crank pin bearing and journal bearing of main engine, crank pin bolts and camshaft driven equipment(Refer to remarks)<br>2. Steam turbine (main, auxiliary, etc.)<br>3. Power transmission gear<br>4. Shafting arrangements<br>5. Air reservoir | ● Measurement of crank web deflection for main diesel engine and check of foundation bolts |

**Table 3 Table for Unified Name of Machinery**

* The following unified expressions will be used in the Society's CMS system for the machinery which has the same purpose but are variously named from ship to ship.

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Cooling Sea Water System | Main Cooling S.W. Pump | - Main Cooling S.W. Pump<br>- Main Condenser Cooling S.W. Pump |
| | Reserve Cooling S.W. Pump | - Reserve Cooling S.W. Pump<br>- Stand-by Cooling S.W. Pump |
| | A/E Cooling S.W. Pump | - A/E Cooling S.W. Pump<br>- Aux. Machinery Cooling S.W. Pump<br>- Aux. G/T Cooling S.W. Pump |
| | Aux. Condenser Cooling S.W. Pump | - Aux Condenser Cooling S.W. Pump<br>- Dumping Condenser Cooling S.W. Pump<br>- Vacuum Condenser Cooling S.W. Pump<br>- Atmospheric Condenser Cooling S.W. Pump<br>- Drain Cooler Cooling S.W. Pump |
| | M/E F.W. Generator(Cooling) S.W Pump | |
| | S.W. Circulating Pump | |
| | I.G.G Cooling Water Pump | |
| Sea Water Service System | S.W. Service Pump | |
| Cooling Fresh Water System | M/E Cooling F.W. Pump | - M/E Cooling F.W. Pump<br>- Main Cooling F.W. Pump |
| | M/E Reserve Cooling F.W. Pump | - Reserve Cooling F.W. Pump<br>- Cooling F.W. Service Pump |
| | Aux. Cooling F.W. Pump | - Aux Cooling F.W. Pump<br>- Air Intercooler Cooling F.W. Pump<br>- Turbo Charger Cooling F.W. Pump |
| | M/E Jacket Cooling F.W. Pump | |
| | M/E Piston Cooling F.W. Pump | |
| | Central Cooling F.W. Pump | |
| | A/E Cooling F.W. Pump | - A/E Cooling F.W. Pump<br>- Harbour Cooling F.W. Pump |
| Fuel Oil System | M/E F.O.V. Cooling Pump | - M/E F.O.V. Cooling Pump<br>- M/E F.O.V. Cooling F.W (or Oil) Pump |
| | A/E F.O.V. Cooling Pump | |
| | M/E F.O. Supply/Booster Pump | |
| | M/E F.O. Supply pump | - M/E F.O. Supply Pump<br>- Main H.F.O. Supply pump<br>- Main I.F.O. Supply pump<br>- Main M.D.O. Supply pump<br>- Reserve F.O. Supply pump<br>- F.O. Feed pump<br>- Res. F.O. Supply & F.O. Valve Cooling pump<br>- F.O. Supply & F.O. Transfer pump<br>- Stand-by F.O. Supply Pump |
| | M/E F.O. Booster Pump | |
| | M/E F.O. Service Pump | - M/E F.O. Service Pump<br>- M/E C Oil Service Pump |
| | A/E F.O. Supply Pump | |
| | A/E F.O. Service Pump | - A/E F.O. Service Pump<br>- A/E C Oil Service Pump |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Fuel Oil System (Cont'd) | D.O. Service Pump | - D.O. Service Pump<br>- A Oil Service Pump |
| | F.O. Transfer Pump | - F.O. Transfer Pump<br>- C Oil Transfer Pump<br>- H.F.O. Transfer Pump<br>- I.F.O. Transfer Pump<br>- F.O. Shift Pump<br>- F.O. Transfer & Shift Pump<br>- H.F.O. & M.D.O. Transfer Pump |
| | D.O. Transfer Pump | - D.O. Transfer Pump<br>- A Oil Transfer Pump<br>- M.D.O. Transfer Pump |
| | M/E F.O. Circulating Pump | - F.O. Circulating Pump<br>- F.O. Recycle Pump |
| | Main Boiler F.O. Service Pump | - Boiler F.O. Service Pump<br>- Boiler F.O. Feed Pump<br>- Boiler F.O. Supply Pump<br>- Boiler F.O. Transfer Pump |
| | Main Boiler D.O. Service Pump | - Boiler D.O. Service Pump<br>- Boiler D.O. Feed Pump<br>- Boiler D.O. Supply Pump<br>- Boiler D.O. Transfer Pump |
| | Main Boiler Burning Pump | - Boiler Burning Pump<br>- Boiler Pilot Burner F.O. Pump |
| Lub. Oil System | M/E L.O. Pump | |
| | A/E L.O. Pump | - A/E L.O. Pump<br>- A/E Reserve L.O. Pump<br>- A/E L.O. Service Pump |
| | M/E Reserve L.O. Pump | - Reserve L.O. Pump<br>- Aux. L.O. Pump<br>- Stand-by L.O. Pump |
| | M/E L.O. Service Pump | - L.O. Service Pump<br>- Rocker Arm L.O. Pump<br>- Priming L.O. Pump |
| | M/E Crosshead L.O. Pump | |
| | M/E Camshaft L.O. Pump | |
| | M/E Piston rod Stuffing Box L.O. Pump | |
| | M/E Turbo-charger L.O. Pump | |
| | Reduction Gear L.O. Pump | |
| | L.O. Transfer Pump | - L.O. Transfer Pump<br>- L.O. Shift Pump |
| | Stern Tube L.O. Pump | - Stern Tube L.O. Pump<br>- Forward Seal Cooling L.O. Pump<br>- After Seal Cooling L.O. Pump |
| | C.P.P. Hyd. Oil Pump | |
| Bilge System | Bilge Pump | - Bilge Pump<br>- Aux. Bilge Pump<br>- Bilge & Sanitary Pump<br>- Bilge Transfer Pump |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Bilge System (Cont'd) | Fire & Bilge Pump | - Bilge & Fire Pump<br>- Bilge, Fire & G.S. Pump<br>- Bilge, Fire & Cooling S.W. Pump<br>- Fire, G.S. & S.W. Service Pump<br>- G.S. (& Fire) & Pump |
| | Bilge & Ballast (& Fire) Pump | - Bilge & Ballast Pump<br>- Bilge, Ballast & Fire Pump<br>- Bilge, Ballast (& Fire) & Cooling S.W. Pump |
| Ballast System | Ballast Pump | - Ballast Pump<br>- Ballast & Cooling S.W. Pump<br>- Ballast & G.S. Pump<br>- Ballast & S.W. Service Pump |
| | Stripping Pump | |
| | Heeling Pump | - Heeling Pump<br>- Heeling & Trimming Pump |
| Feed Water System | Main Boiler Feed Water Pump | - Main Boiler Feed Water Pump<br>- Exh. Gas Boiler Feed Water Pump<br>- Exh. Gas Economizer Feed Water Pump<br>- L.P. Steam Generator Feed Water Pump |
| | Aux. Boiler Feed Water Circulating Pump | - Aux. Boiler Feed Water Pump<br>- Aux. Exh. Gas Economizer Feed Water Pump<br>- Aux. L.P. Steam Generator Feed Water Pump |
| | Main Boiler Water Circulating Pump | - Main Boiler Water Circulating Pump<br>- Exh. Gas Boiler Water Circulating Pump<br>- Exh. Gas Economizer Water Circulating Pump<br>- Hot Water Circulating Pump |
| | Aux. Boiler Water Circulating Pump | - Aux. Boiler Water Circulating Pump<br>- Aux. Exh. Gas Boiler Water Circulating Pump<br>- Aux. Exh. Gas Economizer Water Circulating Pump<br>- Hot Water Circulating Pump |
| | Main Condensate Pump | |
| | Condensate Pump for Aux. Turbine | |
| | Reserve Condensate Pump | - Reserve Condensate Pump<br>- Aux. Condensate Pump<br>- Condensate & Drain Transfer Pump |
| | Dump drain Transfer Pump | |
| | Condenser Circulating Pump | - Condenser Circulating Pump<br>- Vacuum Condenser Circulating Pump<br>- Atmospheric Condenser Circulating Pump<br>- Drain Cooler Circulating Pump<br>- Aux. Condenser Circulating Pump |
| Fresh Water System | F.W. Generator for Main Boiler | |
| Air System | Main Air Compressor | - Main Air Compressor<br>- Main Engine Starting Air Compressor |
| | Reserve Air Compressor | - Aux. Air Compressor<br>- Working Air Compressor<br>- Topping up Air Compressor<br>- Instrument Air Compressor<br>- Reserve Air Compressor |
| | Control Air Compressor | |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Fresh Water Cooler | M/E Main Cooling F.W. Cooler | - M/E Main Cooling F.W. Cooler<br>- Central F.W. Cooler |
| | M/E Jacket Cooling F.W. Cooler | |
| | M/E Piston Cooling F.W. Cooler | |
| | A/E F.O.V. Cooling F.W. Cooler | - F.O.V. F.W. Cooler<br>- Fuel Valve & Turbo Charger F.W. Cooler<br>- F.O.V. & Exh. V. Cooling F.W. Cooler |
| | A/E F.O.V. Cooling F.W. Cooler | |
| | A/E Cooling F.W. Cooler | |
| | A/E Turbo-charger Cooling F.W. Cooler | |
| | Exh. Valve Cooling F.W. Cooler | |
| | F.W. Cooler for Air Compressor | |
| Oil Cooler | M/E F.O.V. Cooling Oil Cooler | |
| | A/E F.O.V. Cooling Oil Cooler | |
| | M/E L.O. Cooler | - M/E L.O. Cooler<br>- Main Turbine L.O. Cooler |
| | A/E L.O. Cooler | - A/E L.O. Cooler<br>- Aux. Turbine L.O. Cooler |
| | M/E Turbo-charger L.O. Cooler | |
| | A/E Turbo-charger L.O. Cooler | |
| | Stern Tube L.O. Cooler | |
| | Reduction Gear L.O. Cooler | |
| | M/E Camshaft L.O. Cooler | |
| | C.P.P. Hyd. Oil Cooler | |
| Feed Water Cooler | Aux. Turbine Condenser | - Aux. Turbine Condenser<br>- G/T Condenser |
| | Atmospheric Condenser | - Aux. Atmospheric Condenser<br>- Aux. Condenser<br>- Aux. Condenser & Drain Cooler |
| | Vacuum Condenser | - Vacuum Condenser |
| | Dump Condenser | - Dump Condenser |
| | Drain Cooler | - Drain Cooler<br>- Oil Heating Drain Cooler |
| | Main Condenser | |
| Oil Heater | M/E F.O. Heater | |
| | A/E F.O. Heater | |
| | Main Boiler F.O. Heater | - Boiler F.O. Heater (Steam)<br>- Boiler F.O. Heater (Electric) |
| | Aux. Boiler F.O. Heater | |
| Thermal Oil Heater | Thermal Oil Heater | |
| Feed Water Heater | Main Boiler Feed Water Heater | |
| | Aux. Boiler Feed Water Heater | - Aux. Feed Water Heater<br>- Aux. Boiler Feed Water Heater |
| | Deaerator | - Deaerator |
| | Deaerating Feed Water Heater | - Deaerating Feed Water Heater |
| L.P. Feed Water Heater | 1st Feed Water Heater | |
| | 2nd Feed Water Heater | |
| | 3rd Feed Water Heater | |
| | 4th Feed Water Heater | |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Fresh Water Heater | Hot Water Heater | - Hot Water Heater<br>- Calorifier |
| | Main Engine F.W. Heater | |
| Other Heat Exchanger | F.W. Generator for Main Boiler | |
| | Refrigerator Condenser | |
| Air Reservoir | Main Air Reservoir | - Main Air Reservoir<br>- Main Engine Starting Air Reservoir |
| | A/E Air Reservoir | - Aux. Air Reservoir<br>- Working Air Reservoir<br>- Aux. Engine Starting Air Reservoir<br>- Cargo Pump Engine Starting Air Reservoir<br>- Em'cy Air Reservoir |
| | Service Air Reservoir | |
| | Control Air Reservoir | |
| F.O. Tank | M/E F.O. Settling Tank | - M/E F.O. Settling Tank<br>- M/E H.F.O. Settling Tank<br>- M/E I.F.O. Settling Tank<br>- M/E M.D.O. Settling Tank |
| | M/E F.O. Service Tank | - M/E F.O. Service Tank<br>- M/E H.F.O. Service Tank<br>- M/E I.F.O. Service Tank<br>- M/E M.D.O. Service Tank |
| | A/E F.O. Settling Tank | - A/E F.O. Settling Tank<br>- A/E A Oil Settling Tank |
| | A/E F.O. Service Tank | - A/E F.O. Service Tank<br>- A/E A Oil Service Tank<br>- A/E F.O. Tank |
| | Boiler F.O. Settling Tank | - Boiler F.O. Settling Tank<br>- Boiler H.F.O. Settling Tank<br>- Boiler M.D.O. Settling Tank |
| | Boiler F.O. Service Tank | - Boiler F.O. Service Tank<br>- Boiler H.F.O. Service Tank<br>- Boiler M.D.O. Service Tank |
| | D.O. Settling Tank | |
| | D.O. Service Tank | |
| Cargo System | Cargo Pump | - Cargo (Oil) Pump<br>- Cargo Pump (Motor)<br>- Aux. Cargo Pump<br>- Cargo & Ballast Pump |
| | Stripping Pump | |
| | Spray Pump | |
| Pump in Pump Room | Ballast Pump in Pump Room | |
| | Clean Ballast Pump in Pump Room | |
| | Ballast Pump in FWD. Pump Room(or F'CLE) | - Ballast Pump in FWD. Pump Room<br>- Ballast Pump in F'CLE |
| | Bilge Pump | |
| | S.W. Service Pump | |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| Tank Cleaning System | Tank Cleaning Pump | - Tank Cleaning Pump<br>- Butterworth Pump<br>- Tank Cleaning & Fire Pump<br>- Butterworth & Tank Cleaning Pump<br>- Tank Cleaning & Bilge, Fire, (G.S.) Pump<br>- Butterworth & Bilge, Fire, (G.S.) Pump |
| | Tank Cleaning Heater | - Tank Cleaning Heater<br>- Butterworth heater |
| | Tank Cleaning Drain Cooler | - Tank Cleaning Drain Cooler<br>- Butterworth Drain Cooler |
| Other Machinery in Pump Room | Ventilation Fan | |
| Deck Machinery | Hyd. Pump for Steering Gear | |
| | Windlass | |
| | Mooring Winch | - Mooring Winch<br>- Auto Tension Winch |
| | Hyd. Pump for Deck Machinery | |
| | Capstan | |
| Cargo Refrigerating Machinery | Compressor | |
| | Condenser Cooling Pump | - Condenser Cooling Pump<br>- Ref. Cooling S.W. (or F.W.) Pump<br>- Ref. & Aux. Cooling S.W. (or F.W.) Pump |
| | Brine Pump | |
| | Refrigerant Pump | |
| | Condenser | |
| | Evaporator | |
| | Evaporator Cooling S.W. Pump | |
| Machinery for Gas Carrier | Gas Compressor | |
| | High Duty Compressor | |
| | Low Duty Compressor | |
| | Vacuum Pump | |
| | Main Vaporizer | |
| | Forced Vaporizer | |
| | Boil-off/Warm-up Heater | |
| | Vent Gas Heater | |
| | N2 Generator Unit | |
| | N2 Buffer Tank | |
| | Inert Gas Generator | |
| | Cargo Heating Drain Cooler | |
| | Glycol Water Steam Heater | |
| | Glycol Water Electric Heater | |
| | Glycol Water Circulating pump | |

**Table 3 Table for Unified Name of Machinery** (continued)

| System | Unified name of machinery to be used in CMS system | Various names of machinery actually used in ships |
|---|---|---|
| SCR | SCR Chamber | |
| | Air Compressor for SCR | |
| | S.W. Pump for SCR | |
| | Air Blower for SCR | |
| EGR | S.W. Pump for EGR | |
| | EGR Sludge Discharge Pump | |
| | EGR Sludge Tank | |
| EGCS | S.W. Pump for EGCS | |
| | Seal Air Fan for EGCS | |
| | S.W. Booster Pump for EGCS | |
| | Scrubber Wash Water Discharge Pump | |
| | Scrubber Wash Water Sludge Pump | |
| | Scrubber Wash Water Discharge Tank | |
| | Scrubber Wash Water Sludge Tank | |
| | EGCS Scrubber (Body) | |
| Chemical for SCR, EGR, EGCS | Urea Supply Pump | |
| | Urea Tank | |
| | NaOh Dosing Pump | |
| | NaOh Pump | |
| | NaOh Tank | |
| | Chemical Injection Pump | |
| | Make-up Pump | |
| | Process Tank | |
| | Mixing Tank | |

# Annex 1-8 Planned Maintenance System Procedure(PMS)

## 1. General

(1) At the request of Owner, PMS is to be approved by the Society in accordance with **Fig 1** and Information and Documents given in **Table 1** including the following items are to be submitted. *(2019)*
(A) organization chart identifying areas of responsibility
(B) documentation filling procedures
(C) listing of equipment to be considered by the Society in PMS
(D) machinery identification procedure
(E) preventing maintenance sheets for each machine to be considered
(F) listing and schedule of preventive maintenance procedure.

(2) In addition to the above documentation the following information shall be available on board: *(2019)*
(A) the above (1) in an up-to-date fashion
(B) maintenance inspection(manufacturer's and shipyard's)
(C) reference documentation (trend investigation procedure etc.)
(D) records of maintenance including repairs and renewals carried out.

(3) An annual report covering the year's service, including the following information as required under clauses (1) (C) and (E) as well as the information on changes to other clauses in (1), shall be reviewed by the Society. *(2019)*

(4) In general, the intervals for PMS shall not exceed those specified for CMS. However, for components where the maintenance is based on running hours longer intervals may be accepted as long as the intervals are based on the manufacturer's recommendations. *(2019)*

(5) The PMS shall be programmed and maintained by a computerized system. However, this may not be applied to the current already approved schemes. Computerized systems shall include back-up devices, such as disks/tapes, CDs, which are to be updated at regular intervals.

(6) If requested by the applicant, the PMS software shall be reviewed and approved in accordance with Annex 3, "PMS Software Approval," and a type approval certificate shall be issued.

(7) Notation
(A) PMS: A ships where the Planned Maintenance System specified in **Pt 1, Ch 2, 903.** of the Rules is applied.
(B) PMS-CBM: A ships where the Condition Based Maintenance System specified in **Pt 1, Ch 2, 903. 3** of the Rules is applied.
(C) PMS(S): A ships where the PMS software with type approval in addition to the PMS applied in (a) above.

## 2. Chief Engineer's responsibility of PMS.

(1) Shipowner(or ship management company) is responsible for ensuring that Chief Engineer is qualified to maintain the PMS-covered equipment, and First-grade licence issued in the relevant nation for Chief Engineer is to be provided.

(2) The chief engineer shall be the responsible person on board in charge of the PMS.

(3) Documentation on overhauls of items covered by the PMS shall be reported and signed by the chief engineer.

(4) Access to computerized systems for updating of the maintenance documentation and maintenance program shall only be permitted by the chief engineer or other authorized person.

(5) PMS items to be maintained by Chief Engineer is to be complied with **Table 2** and to be retained on board the overhauled(or opened up) records. However, PMS items not permitted by Chief Engineer's records in **Table 2** are to be surveyed under the attending surveyor as far as practicable at Annual Survey.

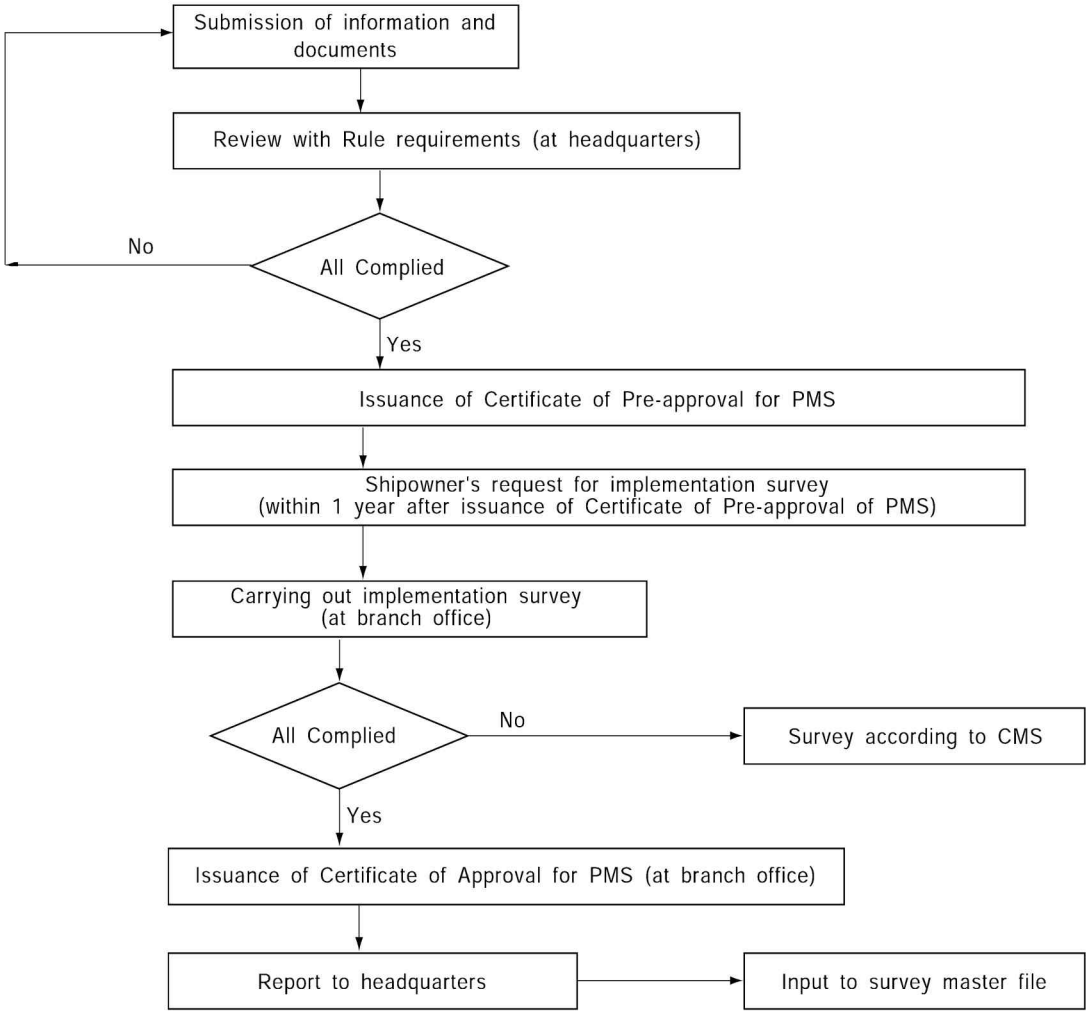



Fig 1 Flow chart for approval procedures

**Table 1 Information and Documents to be submitted**

| Name and content | Remarks |
|---|---|
| (1) Machinery inventory content:<br>Listing of machinery subjected to maintenance, and index or code for each machinery. | ● Unify classification nomenclature for machinery to use the same names as far as possible.<br>● machinery index or code and CMS code.<br>● Identify and mark items not permitted by the chief engineer. |
| (2) Maintenance schedule:<br>(A) It is to be stated for PMS of each item of machinery as follows:<br>- Identification of overhaul survey, kind of inspection and test and content of measurement record<br>- Intervals of overhaul survey, inspection and measurement<br>(B) It is to be stated for CM as follows:<br>- Layout of CM, maker, model and specification of CM equipment<br>- Measuring points, names of measuring instruments and measuring parameters for each machinery<br>- Intervals of measurement for each machinery<br>- Acceptable limits for monitored condition for each machinery<br>- Examples of input and output data | ● To be satisfied the Rules requirements for overhaul survey, inspection, measurement, etc. of all machinery.<br>● To be overhauled with period not to exceed 5 year<br>● To be confirmed that quantity of machinery to be surveyed every year is not less than about 20 % of machinery covered by PMS.<br>● To be reviewed CM layout and feasibility of measuring parameters.<br>● To be sure that output format is easily recognizable by the chief engineer.<br>● To be reviewed the feasibility of acceptable limit. |
| (3) Reporting system:<br>(A) To be stated in the program as follows:<br>- Records of maintenance and repairs<br>- Spare parts<br>(B) A regular reporting system between the ship and the supporting land department of the ship company is to be stated. | ● Ease in confirming that all reporting and recording procedures are carried out exactly. |
| (4) Documents for qualification requirements of the chief engineer:<br>(A) Copy of chief engineer's licence<br>(B) Chief engineer's resume | ● To be satisfied with the requirements of chief engineer's qualification. |

**Table 2 Machinery with permission of maintenance by the chief engineer in PMS**

| System | Machinery with permission of maintenance by the chief engineer under a PMS | Not permission of maintenance by the chief engineer but subject to the attending Surveyor. |
|---|---|---|
| Main diesel engines | 1. Cylinder covers<br>2. Valves and valve gears<br>3. Cylinder blocks and liners<br>4. Pistons and piston rods<br>5. Connecting rods, crossheads, top end bearings, guides, gudgeon pins and bushes<br>6. Crankshafts and bearings<br>7. Scavenge pumps, blowers and air coolers<br>8. Camshafts and camshaft drives | 1. Relief devices(Crankcase, scavenging air chamber, camshaft driving gear room, etc.)<br>2. Engine trial<br>3. Holding down bolts and chocks |
| Main Turbines | Casings, rotors, blades, bearing, nozzle, nozzle valve and control valve<br>- with CM equipment whose monitoring of operating parameters and vibration measurement is found in satisfactory under the attending Surveyor only. | 1. Holding down bolts and chocks<br>2. In case without CM equipment, it is to be surveyed after opening the top casing of turbine. |
| Auxiliary Engines | Auxiliary engines, auxiliary steam turbines and their associated coolers and pumps.<br>- But, where those are used for driving generator, it is limited to the case where power can be supplied to the essential auxiliaries necessary forpropulsion and safety of ship and cooling of refrigerated cargo by the remaining generator(s) that are not under maintenance even during maintenance of one unit. | Auxiliary internal combustion engines or auxiliary steam turbines driving generators<br>- In case of satisfying conditions in the left column, the chief engineer's maintenance may be permitted. |
| Shafting | 1. Intermediate shafts and bearings<br>2. Thrust shafts and bearing | 1. Reduction/increase gearing<br>2. Flexible couplings and clutches |
| Remote Control and Automation System | Records for malfunction, abnormal alarms, etc., are to be made and submitted to the Society. | 1. Main engine control system for bridge, centralized or automatic controls<br>2. Requirements for centralized controls or unattended machinery automations |
| Pressure vessels and auxiliaries | 1. Pumps attached to main engine(bilge, L.O., F.O. and cooling water)<br>2. Independently driven pumps(bilge, ballast, F.W. cooling, S.W. cooling, L.O. and F.O. transfer)<br>3. Coolers and condensers (F.W. and L.O. coolers for main engine, main and auxiliary condensers and drain coolers)<br>4. Heaters(F.O., L.O. and feed water)<br>5. Other auxiliaries(air compressors including safety devices, windlasses, mooring winches, forced or induced draft fans and Independent F.O. tanks)<br>6. Air reservoir | 1. First start arrangement trial<br>2. Piping arrangements: steam pipes, sea connections and valves, maneuvering valves, bulkhead stop valves, bilge check-stop valves (including foot valves)<br>3. Steering gear<br>4. Electrical equipment Others |
| Others | IGS(scrubber units, blowers, independent gas generating units)<br>Exhaust gas emission abatement system(SCR, EGR & EGCS) | IGS(all components for inert gas system except for items covered by the chief engineer's maintenance) |

### 3. PMS Software type approval

(1) Application
(A) This procedure applies to the testing and inspection required for the type approval of PMS software.
(B) Procedures and regulations for type approval of PMS software shall comply with the **'Guidelines for Approval of Manufacturing Process and Type Approval'.**
(C) The certificate validity period is five years, and renewal audits shall be carried out every five years to verify the conformity of the software after maintenance and updates.

(2) Documents to be Submitted
(A) The applicant for software approval shall submit the following related materials along with the PMS program approval request:
(a) Software package (demo software and installation files, including any necessary dedicated installation programs)
(b) Operation manual, which includes:
(i) System requirements (e.g., CPU, operating system, hard disk capacity, memory capacity)
(ii) Software install and uninstall procedures
(iii) Function of the software
(iv) Operation methods
(v) Other documents deemed necessary by the Society
(c) Type test program that demonstrates compliance with the software requirements specified in section (3) Functions.

(3) Functions
(A) PMS Functional requirements
(a) It is to be capable of registering the maintenance plans for those survey items required by the machinery maintenance scheme (PMS).
(b) It is to be capable of specifying the time schedule of maintenance or running hours for each item of machinery and equipment including their parts.
(c) It is to be capable of displaying a list of at least the following items. The list is to classify the registered machinery, equipment and their parts and to be displayed in a tree structure format, etc.
(i) Names of machinery, equipment and their parts
(ii) PMS items
(iii) PMS intervals (next maintenance schedule or operating hours)
(iv) PMS schedule (allow direct entry of maintenance dates or calculate PMS intervals)
(v) Person in charge of maintenance
(d) Maintenance intervals are not, in principle, to exceed five years. Maintenance intervals are to be capable of being displayed on the list of maintenance within a term which is arbitrarily designated.
(e) Maintenance items that expire after the designated maintenance period are easily identifiable.
(B) Maintenance Records Function
(a) It is to be capable of managing and recording the results of the maintenance conducted by PMS specified in (A) PMS Functional Requirements. The items regarding management and record are to be included the following:
(i) Names of machinery, equipment, and parts
(ii) Maintenance items and results (including part replacements)
(iii) Completion dates of maintenance
(iv) Total running hour
(v) Next inspection date
(vi) Measurement data (if applicable, including design dimensions and allowable tolerances)
(vii) The condition of damage and the repair method in cases where damage was found.
(C) List of the maintenance items within the designated term is to be displayed. Such lists are to include the name of machinery,equipment and their parts together with the maintenance items and the maintenance completion date.

(D) Past maintenance records are to be displayed in cases where machinery, equipment and their parts are arbitrarily selected.
(E) The ship owner (or ship management) shall periodically access or receive PMS records for management purposes.
(F) The software shall include search and filter functionality.

(4) Software Management
(A) Revision Management
Software manufacturers and administrators shall apply for re-approval if significant changes occur due to system updates. Specific revision details shall be displayed on the home screen or menus.
(B) Backup Management
Software manufacturers and administrators are to specify proper procedures for backing up administrated maintenance data.

(5) Type test
Type tests are to comply with the requirements given in **Sec 3. 104 'Guidelines for Approval of Manufacturing Process and Type Approval'.**

## 4. Condition Monitoring(CM) and Condition Based Maintenance(CBM) *(2019)*

(1) General

(A) Application
(a) These Annex apply to the approved Condition Monitoring and Condition Based Maintenance schemes where the condition monitoring results are used to influence the scope and/or frequency of Class survey.
(b) This Annex may be applied to components and systems covered by Continuous Machinery Survey (CMS), and other components and systems as requested by the owner. The extent of Condition Based Maintenance and associated monitoring equipment to be included in the maintenance scheme is decided by the Owner.
(c) These Annex can be applied only to vessels operating on approved PMS survey scheme.
(d) The Annex may be applied to any individual items and systems. Any items not covered by the scheme are to be surveyed and credited in accordance with the requirements in **Pt 1**.

(2) Definitions

(A) The following standard terms are defined in ISO13372.
(a) Condition monitoring : acquisition and processing of information and data that indicate the state of a machine over time. The machine state deteriorates if faults or failures occur.
(b) Diagnostic : examination of symptoms and syndromes to determine the nature of faults or failures.
(c) Condition Based Maintenance : maintenance performed as governed by condition monitoring programmes.

(3) Condition Monitoring(CM)

(A) Where an approved condition monitoring system is fitted, credit for survey may be based on acceptable condition monitoring results. The condition monitoring results are to be reviewed during the annual audit.
(B) Limiting parameters are to be based on the Original Equipment Manufacturers guidelines (OEM), or a recognised international standard. The parameters in **Table 3** may considered. *(2022)*
(C) The condition monitoring system is to provide an equivalent or greater degree of confidence in the condition of the machinery to traditional survey techniques.
(D) The condition monitoring system is to be approved in accordance with This Society's procedures.
(E) A condition monitoring system may be used to provide a greater understanding of equipment condition, and a condition based maintenance scheme may be used to obtain maintenance efficiency. Class approval is required where owners wish to change the survey cycle based on CM/CBM.
(F) Software systems can use complex algorithms, machine learning and knowledge of global equipment populations/defect data in order to identify acceptability for continued service or

the requirement for maintenance. These systems may be independent of the OEM recommended maintenance and condition monitoring suggested limits. Approval of this type of software is to be based on OEM recommendations, industry standards and Class Society experience.

(G) The Society retains the right to test or open-up the machinery, irrespective of the CM results, if deemed necessary.

(4) Condition Based Maintenance(CBM)

(A) Where an owner wishes to base their equipment maintenance on a CBM approach, this is to meet the requirements of the ISM Code.

(B) Where an agreed planned maintenance and CBM scheme is in operation, the CMS and other survey intervals may be extended based on OEM maintenance recommendations and acceptable condition monitoring results.

(C) Limiting parameters (alarms and warnings) are to be based on the OEM guidelines, or a recognised international standard. The parameters in **Table 3** may considered. *(2022)*

(D) The CBM scheme is to provide an equivalent or greater degree of confidence in the condition of the machinery to traditional maintenance techniques.

(E) The scheme is to be approved in accordance with This Society's procedures.

(F) Software systems can use complex algorithms, machine learning and knowledge of global equipment populations/defect data in order to identify acceptability for continued service or the requirement for maintenance. These systems may be independent of the OEM recommended maintenance and condition monitoring suggested limits. Approval of this type of software is to be based on OEM recommendations, industry standards and Class Society experience.

(5) Procedures and Conditions for approval of CM and CBM

(A) Onboard Responsibility

(a) The chief engineer is to be the responsible person on board in charge of the CM and CBM.

(b) Documentation on the overhaul of items covered by CM and CBM schemes are to be reported by the chief engineer.

(c) Access to computerized systems for updating of the maintenance documentation and maintenance program are to only be permitted by the chief engineer or other authorized person.

(d) All personnel involved in CM and CBM is to be appropriately qualified.

(e) CM does not replace routine surveillance or the chief engineer's responsibility for taking decisions in accordance with his judgement.

(B) Equipment and System Requirements

(a) CM equipment and systems are to be approved in accordance with a procedure of the Society.

(b) The CM/CBM scheme and its extent, are to be approved by the Society.

(c) The CBM scheme is to be capable of producing a condition report, and maintenance recommendations.

(d) A system is to be provided to identify where limiting parameters (alarms and warnings) are modified during the operation of the scheme.

(e) Where CM and CBM schemes use remote monitoring and diagnosis (i.e. data is transferred from the vessel and analysed remotely), the system is to meet the applicable standards for Cyber Safety and Security. The system is to be capable of continued onboard operation in the event of loss of the communication function.

(f) CBM schemes are to identify defects and unexpected failures that were not prevented by the CM system.

(g) Systems are to be include a method of backing up data at regular intervals.

(C) Documentation and Information

(a) The following documentation is to be made available to the Society for the approval of the scheme:

(i) The following documentation is to be made available to the Society for the approval of the scheme:

(ii) Listing of equipment to be included in the scheme

(iii) Listing of acceptable condition monitoring parameters
(iv) Description of CBM scheme
(v) Listing, specifications and maintenance procedures for condition monitoring equipment
(vi) Baseline data for equipment with condition monitoring
(vii) Qualification of personnel and company responsible for analysing CM results

(b) In addition to the above documentation the following information is to be available on board:
(i) All clauses in above (a) in an up-to-date fashion
(ii) Maintenance instructions (manufacturer's and shipyard's)
(iii) Condition monitoring data including all data since last opening of the machine and the original base line data
(iv) Reference documentation (trend investigation procedures etc.)
(v) Records of maintenance including repairs and renewals carried out
(vi) Records of changes to software systems and parameters
(vii) Sensors calibration records / certification / status

(D) Approval validity
(a) An Annual Audit is to be carried out to maintain the validity of the CM/CBM scheme.
(b) The survey arrangement for machinery under CM/CBM can be cancelled by the Society if the scheme is not being satisfactorily carried out either from the maintenance records or the general condition of the machinery.
(c) The case of sale or change of management of the ship or transfer of class shall cause the approval to be reconsidered.
(d) The ship owner may, at any time, cancel the survey arrangement for machinery under the scheme by informing the Society in writing and for this case the items which have been inspected under the scheme since the last annual Audit can be credited for class at the discretion of the attending surveyor.

(6) Surveys

(A) Installation Survey
Condition monitoring equipment is to be installed and surveyed in accordance with class society rules, and a set of base line readings is to be taken.

(B) Implementation Survey
(a) The Implementation Survey is to be carried out by the Society's surveyor no earlier than 6 months after installation survey and no later than the first Class annual survey.

(b) During the Implementation survey the following is to be verified by a surveyor:
(i) the CM/CBM scheme is implemented according to the approval documentation, including a comparison with baseline data;
(ii) the scheme is producing the documentation required for the Annual Audit and the requirements of surveys and testing for the maintenance of class are complied with;
(iii) the onboard personnel are familiar with operating the scheme.
(iv) records of any limiting parameters (alarms and warnings) that have been modified during the operation of the scheme.
(v) Records of any failures of monitored equipment are to be reviewed to ensure that the condition monitoring scheme is effective / sufficient.

(c) When this survey is carried out and the implementation is found in order, a report describing the scheme is to be submitted to the Society and the scheme may be put into service.

(C) Annual Audit
(a) An annual audit of the CM and CBM scheme is to be carried out by a Society's surveyor concurrently with the Class annual survey.
(b) The purpose of this audit is to be to verify that the scheme is being correctly operated and that the machinery has been functioning satisfactorily since the previous audit. This is to include any limiting parameters (alarms and warnings) that have been modified since the last audit. A general examination of the items concerned is to be carried out.
(c) The performance, condition monitoring and maintenance records isto be examined to verify that the machinery has functioned satisfactorily since the previous survey, or action has been taken in response to machinery operating parameters exceeding acceptable tolerances.
(d) Written details of break-down or malfunction is to be made available.

(e) At the discretion of the surveyor, function tests, confirmatory surveys and random check readings, where Condition Monitoring / Condition Based Maintenance equipment is in use, is to be carried out as far as practicable and reasonable.
(f) The familiarity of the chief engineer and other personnel involved with the CM system is to be verified.
(g) Calibration status of sensors and equipment is to be verified.
(h) Verification that the suitability of the CM/CBM scheme has been reviewed following defects and failures is to be carried out.

(D) Damage and repairs
(a) Damage to components or items of machinery is to be reported to the Society. The repairs of such damaged components or items of machinery are to be carried out to the satisfaction of the Surveyor.
(b) Details of repairs and maintenance carried out are to be examined. Any machinery part, which has been replaced by a spare one, due to damage, is to be retained on board where possible until examined by the Society's Surveyor.
(c) Defect and failure data is to be reviewed in order to ensure the system output is appropriate. Where necessary, following review of the failure data, there is to be a method of amending the CM and CBM scheme. ⚓

**Table 3 Machinery Operating Parameter for Condition monitoring System**

| Items | Operating Parameter |
|---|---|
| Main Diesel Engine | 1. Shaft horse power<br>2. Engine and Shaft RPM<br>3. Cylinder pressure-time curves<br>4. Oil fuel injection pressure-time curves<br>5. Oil fuel temperature or viscosity<br>6. Charge air pressure<br>7. Exhaust gas temperatures<br>8. Engine cooling systems, temperatures and pressures<br>9. Engine lubricating oil system, temperatures and pressures<br>10. Turbo-charger RPM and vibration<br>11. Lubricating oil analysis data<br>12. Crankshaft deflections<br>13. Main bearing temperatures |
| Main Steam Turbine | 1. Turbine rotor vibration<br>2. Turbine rotor axial displacement<br>3. Shaft horsepower<br>4. Shaft and turbine rotor FPM<br>5. Performance data;<br>(1) Steam conditions at inlet and outlet of each turbine<br>(2) Boiler performance data<br>(3) Condenser vacuum<br>(4) Sea temperatures<br>(5) Steam conditions of other major steam consuming auxiliaries |
| Auxiliary Steam Turbine | Same as main steam turbine |
| Auxiliary Diesel Engine | 1. Exhaust gas temperatures<br>2. Engine cooling systems temperatures and pressures<br>3. Engine L.O. system; temperatures and pressures<br>4. Turbo-charger RPM and vibration<br>5. Lub. oil analysis data<br>6. Crankshaft deflections |
| Auxiliaries | 1. Cooler efficiency, inlet and outlet temperatures<br>2. Heater temperatures<br>3. Pumps and fans; vibration and performance<br>4. Differential pressure across filters |

# Annex 1-9 Guidance for Survey of Waterjet Propulsion Systems and Azimuth or Rotatable Thruster

**1.** The surveys for waterjet propulsion systems and azimuth or rotatable thruster are to comply with the following requirements.

(1) Waterjet propulsion systems

(A) Annual Surveys
At each Annual Survey, the following surveys and inspections are to be carried out.
(a) General inspection of the propulsion system
(b) Verification test of steering performance
(c) Operation test of the reverser
(d) General inspection of impeller
(e) Function test of alarm and safety devices, and indication devices for deflector positions, reverser positions and impeller speed, and running indicators of electric motors for hydraulic power systems *(2017)*
(f) Operation test of controls for steering and reversing systems, including tests on change-overs of control systems between navigation bridges and auxiliary steering stations, and change-overs between manual steering and automatic steering. *(2017)*
(g) Tests for supply of the alternative souce of power specified in **Pt 5, Ch 3, Sec 5, 504. 2** of the Rules. *(2017)*
(h) External examination of oil piping and sea water piping *(2017)*

(B) Intermediate Surveys
At each Intermediate Survey, all the requirements of Annual Survey are to be complied with. *(2017)*

(C) Special Surveys *(2017)*
(a) At each Special Survey, all the requirements of Intermediate Survey are to be complied with.
(b) open-up inspections for major part of the hydraulic pump are to be carried.
(c) Holding parts and pins of deflectors or reversers are to be opened up and it is to be confirmed that they are in good working order.

(D) Docking Surveys *(2017)*
At each Docking Survey, the following surveys and inspections are to be carried out.
(a) The wearing condition of the bearing is to be verified with means deemed appropriate by the Society.
(b) General inspection of the forward sealing device. Where considered necessary by the Surveyor, opening up examination may be requested. *(2017)*
(c) Deflector and reverser are to be inspected. *(2017)*
(d) Water intake ducts are to be confirmed to be in good working order. *(2017)*
(e) General inspection of water jet pump *(2017)*
(f) Survey required in **Ch 2, 603. 6** of the Rules. *(2017)*

(E) Main Shaft Surveys *(2017)*
(a) The survey interval is 5 years from the completion date of the previous survey.
(b) After drawing out the main shaft, the condition of the main shaft are to be examined. Where "drawing out" means preparing to be able to sufficiently examine the condition of the main shaft.
(c) General inspection of coupling bolts
(d) General inspection of the major parts of the forward and after main shaft bearings
(e) General inspection of the major parts of the forward main shaft sealing assembly
(f) Open-up inspection for thrust bearing
(g) Inspection of the contact faces of the impeller boss and main shaft(when installed with key and spline)

(F) Extension of shaft survey *(2021)*
(a) Where requested by ship's owner/manager, after survey of the (e), the survey interval may be prolonged for not more than 3 months from the due date.
(b) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.

(c) Where the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.
(d) In addition to (a), where postponement of the docking survey is possible in accordance with **Ch 2, Sec 6, 602.** of the Rules, further extension may be considered to the extent that postponement of the docking survey is possible.
(e) In addition to the annual survey items in subparagraph (A), when extending surveys under (a) and (d), the following items should be satisfactorily verified.
(i) Review of service records.
(ii) Verification of no reported repairs by grinding or welding of shaft and/or Impeller.
(iii) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

(2) Azimuth or rotatable thruster *(2017)*

(A) Annual Surveys
At each Annual Survey, the following surveys and inspections are to be carried out.
(a) General inspection of the thruster
(b) Performance tests of azimuth steering gears
(c) Function test of alarm and safety devices as well as indication devices for azimuth angles, propeller speeds and direction of rotation and pitch positions, and running indicators of electric motors for azimuth steering gears.
(d) Operation tests of controls for steering, including the follings:
(i) tests on change-overs of control systems between navigation bridges and azimuth thruster compartments,
(ii) tests on change-overs between manual steering and automatic steering, if provided.
(e) Tests for supply of the alternative souce of power specified in **Pt 5, Ch 3, Sec 6, 604. 2** of the Rules.
(f) For thrusters which incorporate electric motors in propeller pods, function tests of the followings:
(i) Means to detect ingress of sea water into propeller pods
(ii) Where cooling fans are provided for propulsion motors, cooling fans, control means for stopping such fans and closing any inlets and outlets of air for such fans

(B) Intermediate Surveys
At each Intermediate Survey, all the requirements of Annual Survey are to be complied with.

(C) Special Surveys
(a) At each Special Survey, all the requirements of Intermediate Survey are to be complied with.
(b) Inspections for supporting parts of azimuth steering gears are to be carried out.

(D) Docking Surveys
(a) At each Docking Survey, survey required in **Ch 2, 603. 6** of the Rules are to be carried out.

(E) Propeller Shaft Surveys and Gear unit Surveys *(2019)*
Inspections and surveys specified in the following (a) through (e) are to be carried out.
(a) The survey interval is 5 years from the completion date of the previous survey.
(b) Open-up inspection for propeller shaft sealing device
(c) Examination by surface crack-detection method specified in **Ch 2, 702. 1** (1) (B) and (C) of the Rules
(d) Review of service records including the followings; *(2019)*
(i) lubricating oil analysis records (according to manufacturer's recommendation or a recognised standards) *(2021)*
(ii) written statement of operating condition from the chief engineer
(e) Internal examination for visible parts of the gear unit without dismantling of the internal parts. However, if the results of review specified in (d) are not satisfactory or as deemed necessary by the Society, open-up inspection for gear and bearing is to be carried out. *(2019)*

(F) Extension of shaft survey *(2021)*

(a) Where requested by ship's owner/manager, after survey of the (e), the survey interval may be prolonged for not more than 3 months from the due date.

(b) The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.

(c) Where extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

(d) In addition to (a), where postponement of the docking survey is possible in accordance with **Ch 2, Sec 6, 602.** of the Rules, further extension may be considered to the extent that postponement of the docking survey is possible.

(e) In addition to the annual survey items in subparagraph (A), when extending surveys under (a) and (d), the following items should be satisfactorily verified.

(i) Review of service records. (Include lubricating oil analysis records)

(ii) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

(iii) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

**2.** For the items which are not specified in **Par 1** above, the relevant provisions for propeller shaft, propeller, steering gear and stern tube sealing device specified in **Ch 2, Sec 2** through **Sec 7** of the Rules, are to be applied with the necessary modifications. ⚓

# Annex 1-10 Loading Instrument on Stability

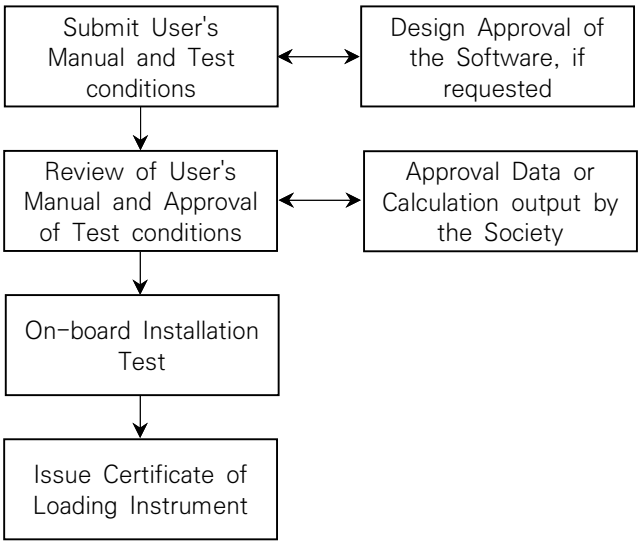
## 1. Application

(1) This requirement applies to ships having a length exceeding 24 *metres* when a loading instrument with a stability computation capability(hereinafter called "loading instrument on stability") is installed on a new ship or newly installed on an existing ship in accordance with the requirement in **Ch 1, 307.** of the Rules.

(2) For the purpose of this requirements, "new ship" means a ship for which the application for Classification Survey during Construction is made on or after 1, July 2021 and "existing ship" means a ship for the application for Classification Survey during Construction before 1, July 2021. *(2021)*

## 2. Approval procedure (2017)

(1) The procedure for approval of a loading instrument on stability is as illustrated in **Fig 1.**




* The approval of the software should be carried out in accordance with "**Guidance for Approval of Manufacturing Process and Type Approval, Etc.**"

**Fig 1 Procedure for the approval of loading instrument on stability for a specific ship.**

(A) User's manual and 3 copies of test conditions are to be submitted to Head Office. The loading instrument on stability of test conditions may be approved provisionally if the stability information booklet is approved provisionally. A provisional certificate may be issued after on-board installation in this case.

(B) The requirements which are checked during review of the user's manual and approval of test conditions are as follows:
- the output of the loading instrument for the exampled test conditions are correct.
- the technical contents and forms of the user's manual is appropriate.

(2) Where the loading instrument on stability is intended for office use on shore(in such case it may be used for stability calculations for several different ships), this is acceptable provided that:

- the procedure in this appendix has been satisfactorily completed.
- the user's manual has been reviewed and test conditions have been approved for each of ships for which the instrument is used.
- operational performance of the hardware is to be tested but environmental testing is not normally required.
- the installation test is to be carried out and a certificate is issued if found appropriate.

(3) Where software of "loading instrument on stability" which has been type approved by the Society, the submission of User's manual may be waived if not specially requested.

### 3. Computer Software for Onboard Stability Calculations *(2021)*

(1) Application

(A) This Unified Requirement is applicable to software which calculates the stability of actual loading conditions and which is installed on ships and on units subject to compliance with the 1966 Load Line Convention or the 1988 Protocol to the Load Line Convention, as amended, the IMO MODU Code and/or the 2008 IS Code.

(B) Where type approved onboard computers for stability calculations is installed, one instrument shall install, and otherwise two instruments are to be installed.

(C) Stability software installed onboard shall cover all mandatory class and statutory intact and damage stability requirements applicable to the ship. This UR, requires approval of software installed on onboard computers which is capable of performing stability calculations.

(D) Active and passive systems are defined in paragraph (3) This UR covers passive systems and the off-line operation mode of active systems only.

(2) General

(A) The scope of a stability calculation software shall be in accordance with the stability information as approved by the administration and shall at least include all information and perform all calculations or checks as necessary to ensure compliance with the applicable stability requirements.

(B) Approved stability software is not a substitute for the approved stability information, and is used as a supplement to the approved stability information to facilitate stability calculations.

(C) The input/output information shall be easily comparable with approved stability information so as to avoid confusion and possible misinterpretation by the operator relative to the approved stability information.

(D) An operation manual is to be provided for the onboard computer stability software.

(E) The language in which the stability information is displayed and printed out as well as the operation manual written shall be the same as used in the ship's approved stability information. However, if the language on the loading insutrument is English, it can be accepted even if the language on the stability information used is not the same. The society may require a translation into a language considered appropriate.

(F) The onboard computer software for stability calculations is to be ship specific and the results of the calculations are to be only applicable to the ship for which it has been approved.

(G) In case of modifications implying changes in the main data or internal arrangement of the ship, the specific approval of any original stability calculation software is no longer valid. The software is to be modified accordingly and re-approved.

(3) Calculation Systems

(A) A passive system requires manual data entry;

(B) An active system replaces the manual entry with sensors reading and entering the contents of tanks, etc.; and

(C) A third system, an integrated system, controls or initiates actions based on the sensor- supplied inputs and is not within the scope of this Requirement.

(4) Types of Stability Software

Four types of calculations performed by stability software are acceptable depending upon a vessel's stability requirements:

(A) Type 1

Software calculating intact stability only (for vessels not required to meet a damage stability criterion).

(B) Type 2
Software calculating intact stability and checking damage stability on basis of a limit curve (e.g. for vessels applicable to SOLAS Part B-1 damage stability calculations, etc.) or checking all the stability requirements (intact and damage stability) on the basis of a limit curve.

(C) Type 3
Software calculating intact stability and damage stability by direct application of pre-programmed damage cases based on the relevant Conventions or Codes for each loading condition (for some tankers etc.).

(D) Type 4
Software calculating damage stability associated with an actual loading condition and actual flooding case, using direct application of user defined damage, for the purpose of providing operational information for safe return to port (SRtP).

Damage stability of both Type 3 and Type 4 stability software shall be based on a hull form model, that is, directly calculated from a full three-dimensional geometric model.

(5) Functional requirements:

(A) General requirements for any type of stability software

(a) The calculation program shall present relevant parameters of each loading condition in order to assist the Master in his judgement on whether the ship is loaded within the approval limits. The following parameters shall be presented for a given loading condition:

- deadweight data;
- lightship data;
- trim;
- draft at the draft marks and perpendiculars;
- summary of loading condition displacement, VCG, LCG and, if applicable, TCG;
- downflooding angle and corresponding downflooding opening (not applicable for Type 2 software which uses limit curve for checking all the stability requirements. However, if intact stability criteria are given in addition to the limit curve, downflooding angle and the corresponding downflooding opening shall be indicated);
- compliance with stability criteria: Listing of all calculated stability criteria, the limit values, the obtained values and the conclusions (criteria fulfilled or not fulfilled) (not applicable for Type 2 software which uses limit curve for checking all the stability requirements. However, if intact stability criteria are given in addition to the limit curve, the limit values, the obtained values and the conclusion shall be indicated).

(b) A clear warning shall be given on screen and in hard copy printout if any of the loading limitations are not complied with.
Loading limitations shall include, but may not be limited to:

- Trim, draught, liquid densities, tank filling levels, initial heel;
- Use of limit KG/GM curves in conjunction with above for Type 2;
- Restrictions to the stowage height for timber where timber load lines are assigned;

(c) Type 3 software is to include pre-defined relevant damage cases for both sides of the ship according to the applicable rules for automatic check of a given loading condition.

(d) The date and time of a saved calculation shall be part of the screen display and hard copy printout.

(e) Each hard copy printout shall contain identification of the calculation program including version number.

(f) Units of measurement are to be clearly identified and used consistently within a loading calculation.

(g) For Type 3 and Type 4 software, the system shall be pre-loaded with a detailed computer model of the complete hull, including appendages, all compartments, tanks and the relevant parts of the superstructure considered in the damage stability calculation, wind profile, down-flooding and up-flooding openings, cross-flooding arrangements, internal

compartment connections and escape routes, as applicable and according to the type of stability software.

(h) For Type 1 and Type 2 software, in case a full three dimensional model is used for stability calculations, the requirements of the computer model are to be as per paragraph 4.1.7 above to the extent as applicable and according to the type of stability software.

(B) Further requirements for Type 4 stability software

(a) The normal (Type 1, 2 and 3) and SRtP (Type 4) software need not be "totally separated". Where the normal and SRtP software are not totally separated:

- the function of switching between normal software and Type 4 software shall be provided.
- the actual intact loading condition is to be the same for both functions(normal operation and SRtP); and
- the SRtP module needs only to be activated in case of an incident.

Approval of Type 4 (SRtP) software is for stability only.

(b) In passenger ships which are subject to SRtP and have an onboard stability computer and shore-based support, such software need not be identical.

(c) Each internal space shall be assigned its permeability as shown below, unless a more accurate permeability has been reflected in the approved stability information.

| Spaces | Permeability | | | |
|---|---|---|---|---|
| | Default | Full | Partially filled | Empty |
| Container Spaces | 0.95 | 0.70 | 0.80 | 0.95 |
| Dry Cargo spaces | 0.95 | 0.70 | 0.80 | 0.95 |
| Ro-Ro spaces | 0.95 | 0.90 | 0.90 | 0.95 |
| Cargo liquids | 0.95 | 0.70 | 0.80 | 0.95 |
| Intended for consumable liquids | 0.95 | 0.95 | 0.95 | 0.95 |
| Stores | 0.95 | 0.60 | (0.60) | 0.95 |
| Occupied by machinery | 0.85 | | | |
| Void spaces | 0.95 | | | |
| Occupied by accommodation | 0.95 | | | |

(d) The system shall be capable of accounting for applied moments such as wind, lifeboat launching, cargo shifts and passenger relocation.

(e) The system shall account for the effect of wind by using the method in SOLAS regulation II-1/7-2.4.1.2 as the default, but allow for manual input of the wind speed/pressure if the on-scene pressure is significantly different (P = 120 N/m2 equates to Beaufort 6; approximately 13.8 m/s or 27 knots).

(f) The system shall be capable of assessing the impact of open main watertight doors on stability (e.g. for each damage case provided for verification, additional damage stability calculation shall be done and presented, taking into account any watertight door located within the damaged compartment(s)).

(g) The system shall utilize the latest approved lightship weight and centre of gravity information.

(h) The output of the software is to be such that it provides the master with sufficient clear

unambiguous information to enable quick and accurate assessment of the stability of the vessel for any actual damage, the impact of flooding on the means of escape and the controls of devices necessary for managing and/or controlling the stability of the ship.
When the actual loading condition is input in the SRtP software, the following output (intact stability) shall be available:

- deadweight data;
- lightship data;
- trim;
- heel;
- draft at the draft marks and perpendiculars;
- summary of loading condition displacement, VCG, LCG and, if applicable, TCG;
- downflooding angle and corresponding downflooding opening;
- free surfaces;
- GM value;
- GZ values relevant to an adequate range of heeling (not less than 60°) available indicatively at the following intervals: 0, 5, 10, 15, 20, 25, 30, 40, 50, 60 deg;
- compliance with relevant intact stability criteria (i.e. 2008 IS Code): listing of all calculated intact stability criteria, the limiting values, the obtained values and the evaluation (criteria fulfilled or not fulfilled);
- GM/KG limiting curve according to SOLAS, Ch II-1, Regulation 5-1.

When the actual loading condition is associated to the actual damage case(s) due to the casualty, the following output (damage stability) shall be available:

- trim;
- heel;
- draft at the draft marks and perpendiculars;
- progressive flooding angle and corresponding progressive flooding openings;
- GM value;
- GZ values relevant to an adequate range of heeling (not less than 60°) available indicatively at the following intervals: 0, 5, 10, 15, 20, 25, 30, 40, 50, 60 deg;
- compliance with stability criteria: listing of all calculated stability criteria, the limit values, the obtained values and the conclusions (criteria fulfilled or not fulfilled);
- the survivability criteria for Type 4 software (SRtP) are left to the discretion of the Administration;
- relevant flooding points (unprotected or weathertight) with the distance from the damage waterline to each point;
- list of all flooded compartments with the permeability considered;
- amount of water in each flooded compartment;
- escape route immersion angles;
- a profile view, deck views and cross-sections of the ship indicating the flooded water-plane and the damaged compartments.

(i) For ro-ro passenger ships there shall be algorithms in the software for estimating the effect of water accumulation on deck (WOD)

(e.g. 1. In addition to the predefined significant wave height taken from the approved stability document, there shall be possibility for the crew to input manually the significant wave height of the ship navigation area in the system, 2. In addition to the predefined significant wave height taken from the approved stability document, calculations with two additional significant wave heights shall be submitted for checking the correctness of the algorithms in the software for estimating the effect of WOD). *

* This paragraph applies to Ro-Ro Passenger ships subject to the Stockholm Agreement (IMO Circular Letter No. 1891)

(6) Acceptable Tolerances

(A) Depending on the type and scope of programs, the acceptable tolerances are to be de-

termined differently, according to (6) (B) or (6) (C). Deviation from these tolerances shall not be accepted unless the Society considers that there is a satisfactory explanation for the difference and that there will be no adverse effect on the safety of the ship.

(a) Examples of pre-programmed input data include the following:

- Hydrostatic data: Displacement, LCB, LCF, VCB, KMt and MCT versus draught.
- Stability data: KN or MS values at appropriate heel/ trim angles versus displacement, stability limits.
- Compartment data: Volume, LCG, VCG, TCG and FSM/ Grain heeling moments vs level of the compartment's contents.

(b) Examples of output data include the following:

- Hydrostatic data : Displacement, LCB, LCF, VCB, KMt and MCT versus draught as well as actual draughts, trim.
- Stability data : FSC (free surface correction), GZ-values, KG, GM, KG/GM limits, allowable grain heeling moments, derived stability criteria, e.g. areas under the GZ curve, weather criteria.
- Compartment data: Calculated Volume, LCG, VCG, TCG and FSM/ Grain heeling moments vs level of the compartment's contents.

The computational accuracy of the calculation program results shall be within the acceptable tolerances, specified in (6) (B) or (6) (C) of the results using an independent program or the approved stability information with identical input.

(B) Programs which use only pre-programmed data from the approved stability information as the basis for stability calculations, shall have zero tolerances for the printouts of input data. Output data tolerances are to be close to zero, however, small differences associated with calculation rounding or abridged input data are acceptable.

Additionally differences associated with the use of hydrostatic and stability data for trims that differ from those in the approved stability information, are acceptable subject to review by the individual Society.

(C) Programs which use hull form models as their basis for stability calculations, shall have tolerances for the printouts of basic calculated data established against either data from the approved stability information or data obtained using the approval authority's model. Acceptable tolerances shall be in accordance with **Table 1**.

Table 1

| Hull Form Dependent | |
|---|---|
| Displacement | +/- 2% |
| Longitudinal center of buoyancy, from AP | +/- 1% / 50 cm |
| Vertical center of buoyancy | +/- 1% / 5 cm |
| Transverse center of buoyancy | +/- 0.5% of B / 5 cm |
| Longitudinal center of flotation, from AP | +/- 1% / 50 cm |
| Moment to trim 1 cm | +/- 2% |
| Transverse metacentric height | +/- 1% / 5 cm |
| Longitudinal metacentric height | +/- 1% / 50 cm |
| Cross curves of stability | +/- 5 cm |
| Compartment dependent | |
| Volume or deadweight | +/- 2% |
| Longitudinal center of gravity, from AP | +/- 1% / 50 cm |
| Vertical centre of gravity | +/- 1% / 5 cm |
| Transverse center of gravity | +/- 0.5% of B / 5 cm |
| Free surface moment | +/- 2% |
| Shifting moment | +/- 5% |
| Level of contents | +/- 2% |
| Trim and stability | |
| Draughts (forward, aft, mean) | +/- 1% / 5 cm |
| GMt (both solid and corrected for free surfaces) | +/- 1% / 5 cm |
| GZ values | +/- 5% / 5 cm |
| Downflooding angle | +/- 20 |
| Equilibrium angles | +/- 10 |
| Distance from WL to unprotected and weathertight openings, or other relevant point, if applicable | +/- 5% / 5 cm |
| Areas under righting arm curve | +/- 5% / 0.0012mrad |

Notes:

1. Deviation in % = {(base value-applicant's value)/base value} *100
   Where the "base value" may be from the approved stability information or the society's computer model.
2. When applying the tolerances in Table 1 having two values, the allowable tolerance is the greater of the two values.
3. Where differences in calculation methodology exist between the programs used in the comparison, this may be a basis for accepting deviations greater than that specified in Table 1 provided a software examination is carried out in sufficient detail to clearly document that such differences are technically justifiable.
4. Deviation from these tolerances shall not be accepted unless the Society considers that there is a satisfactory explanation for the difference and that it is clearly evident from the Society's stability calculations that the deviation does not impact compliance with the required stability criteria for the ship under consideration.

(7) Approval Procedure

(a) Conditions of approval of the onboard software for stability calculations
The onboard software used for stability calculations is subject to approval, which is to include;

- verification of design approval, if any;
- verification that the data used is consistent with the current condition of the ship. (Refer to para (7.2));
- verification and approval of the test conditions;
- verification that the software is appropriate for the type of ship and stability calculations required;
- verification of functional requirements under paragraph (5) (A) (b).

The satisfactory operation of the software with the onboard computer(s) for stability calculations is to be verified by testing upon installation. (Refer to para (9).
A copy of the approved test conditions and the operation manual for the computer/software are to be available on board.

(7.1) General Approval (optional):

(A) Upon application to the Society for general approval of the calculation program, the Society may provide the applicant with test data consisting of two or more design data sets, each of which is to include a ship's hull form data, compartmentation data, lightship characteristics and deadweight data, in sufficient detail to accurately define the ship and it's loading condition.

(B) Acceptable hull form and compartmentation data may be in the form of surface coordinates for modeling the hull form and compartment boundaries, e.g: a table of offsets, or in the form of pre-calculated tabular data, e.g: hydrostatic tables, capacity tables, etc., depending upon the form of data used by the software being submitted for approval.

(C) Alternatively, the general approval may be given based on at least two test ships agreed upon between the society and the applicant.

(D) In general, the software is to be tested for two types of ships for which approval is requested, with at least one design data set for each of the two types. Where approval is requested for only one type of ship, a minimum of two data sets for different hull forms of that type of ship are required to be tested.

(E) For calculation software which is based on the input of hull form data, design data sets shall be provided for three types of ships for which the software is to be approved, or a minimum of three data sets for different hull forms, if approval is requested for only one type of ship.

(F) Representative ship types which require different design data sets due to their hull forms, typical arrangements, and nature of cargo include: tanker, bulk carrier, container ship, and other dry cargo and passenger ships.

(G) The test data sets shall be used by the applicant to run the calculation program for the test ships. The results obtained (together with the hydrostatic data and cross-curve data developed by the program, if appropriate) shall be submitted to the Society for the assessment of the program's computational accuracy.

(H) The Society shall perform parallel calculations using the same data sets and a comparison of these results will be made against the applicant's submitted program's results.

(7.2) Specific Approval:

(a) The Society shall verify the accuracy of the computational results and actual ship data used by the calculation program for the particular ship on which the program will be installed.

(b) Upon application to the Society for data verification, the Society and the applicant shall agree on a minimum of four loading conditions, taken from the ship's approved stability information, which are to be used as the test conditions.

For ships carrying liquids in bulk, at least one of the conditions shall include partially filled tanks. For ships carrying grain in bulk, one of the grain loading conditions shall include a partially filled grain compartment.

Within the test conditions each compartment shall be loaded at least once. The test conditions normally are to cover the range of load draughts from the deepest envisaged loaded condition to the light ballast condition and shall include at least one departure and one arrival condition.

For Type 4 stability software for SRtP, the Society shall examine at least three damage cases, each of them associated with at least three loading conditions taken from the ship's approved stability information. Output of the software is to be compared with results of corresponding load/damage case in the approved damage stability booklet or an alternative independent software source.

(c) The Society is to verify that the following data, submitted by the applicant, is consistent with arrangements and most recently approved lightship characteristics of the ship according to current plans and documentation on file with the Society, subject to possible further verification on board:

- Identification of the calculation program including version number;
- Main dimensions, hydrostatic particulars and, if applicable, the ship profile;
- The position of the forward and after perpendiculars, and if appropriate, the calculation method to derive the forward and after draughts at the actual position of the ship's draught marks;
- Ship lightweight and centre of gravity derived from the most recently approved inclining experiment or light weight check;
- Lines plan, offset tables or other suitable presentation of hull form data if necessary for the Society to model the ship;
- Compartment definitions, including frame spacing, and centres of volume, together with capacity tables (sounding/ullage tables), free surface corrections, if appropriate;
- Cargo and Consumables distribution for each loading condition

Verification by the Society does not absolve the applicant and shipowner of responsibility for ensuring that the information programmed into the onboard computer software is consistent with the current condition of the ship.

(8) Operation Manual

A simple and straightforward operation manual is to be provided, containing descriptions and instructions, as appropriate, for at least the following:

- installation
- function keys
- menu displays
- input and output data
- required minimum hardware to operate the software
- use of the test loading conditions
- computer-guided dialogue steps
- list of warnings

(9) Installation Testing

To ensure correct working of the computer after the final or updated software has been installed, it is the responsibility of the ship's Master to have test calculations carried out according to the following pattern in the presence of a Society surveyor:

From the approved test conditions at least one load case (other than light ship) shall be calculated.

Note: Actual loading condition results are not suitable for checking the correct working of the computer.

Normally, the test conditions are permanently stored in the computer.

Steps to be performed:

(A) Retrieve the test load case and start a calculation run; compare the stability results with those in the documentation.

(B) Change several items of deadweight (tank weights and the cargo weight) sufficiently to change the draught or displacement by at least 10%. The results are to be reviewed to ensure that they differ in a logical way from those of the approved test condition.

(C) Revise the above modified load condition to restore the initial test condition and compare the results. Confirm that the relevant input and output data of the approved test condition have been replicated.

(D) Alternatively, one or more test conditions shall be selected and the test calculation performed by entering all deadweight data for each selected test condition into the program as if it were a proposed loading. The results shall be verified as identical to the results in the approved copy of the test conditions.

(10) Periodical Testing

(A) It is the responsibility of the ship's master to check the accuracy of the onboard computer for stability calculations at each Annual Survey by applying at least one approved test condition. If a Society surveyor is not present for the computer check, a copy of the test condition results obtained by the computer check is to be retained on board as documentation of satisfactory testing for the surveyor's verification.

(B) At each Special Survey this checking for all approved test loading conditions is to be done in presence of the surveyor.

(C) The testing procedure shall be carried out in accordance with paragraph (9).

(11) Other Requirements

(A) Protection against unintentional or unauthorised modification of programs and data shall be provided.

(B) The program shall monitor operation and activate an alarm when the program is incorrectly or abnormally used.

(C) The program and any data stored in the system shall be protected from corruption by loss of power.

(D) Error messages with regard to limitations such as filling a compartment beyond capacity, or exceeding the assigned load line, etc. shall be included. ⚓

# Annex 1-11 Procedural Requirements for Service Suppliers - 〈Void〉 *(2019)*

(Refer to the Guidance of Approval for Service Suppliers)

# Annex 1-12 Hull Survey for Classification Survey during Construction

## 1. Scope

The scope of this Annex includes the following main activities:

(1) Examination of the parts of the ship covered by classification rules and by applicable statutory regulations for hull construction, to obtain appropriate evidence that they have been built in compliance with the rules and regulations, taking account of the relevant approved drawings.

(2) Appraisal of the manufacturing, construction, control and qualification procedures, including welding consumables, weld procedures, weld connections and assemblies, with indication of relevant approval tests.

(3) Witnessing inspections and tests as required in the classification rules used for ship construction including materials, welding and assembling, specifying the items to be examined and/or tested and how (e.g. by hydrostatic, hose or leak testing, non destructive examination, verification of geometry) and by whom.

(4) Appraisal of material and equipment used for ship construction and their inspection at works is not included in this Annex. Details of requirements for hull and machinery steel forgings and castings and for normal and higher strength hull structural steel are given in IACS UR W7(Hull and Machinery Steel Forging), W8(Hull and Machinery Steel Casting) and W11(Normal and High Strength Hull Structural Steels) respectively. Acceptance of these items is verified through the survey process carried out at the manufacturer's works and the issuing of the appropriate certificates.

(5) In addition to above (1) to (4), for tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10(Goal-based ship construction standards for bulk carriers and oil tankers), see also **Appendix 1-12-2** to this Annex.

## 2. Definitions

(1) The hull structure is defined as follows:

(A) hull envelope including all internal and external structures,
(B) superstructures, deckhouses and casings,
(C) welded foundations, e.g. main engine seatings,
(D) hatch coamings, bulwarks,
(E) all penetrations fitted and welded into bulkheads, decks and shell,
(F) the fittings of all connections to decks, bulkheads and shell, such as air pipes and ship side valves - all ILLC 1966, as amended, items.

(G) welded attachments to shell, decks and primary members, e.g. crane pedestals, bitts and bollards, but only as regards their interaction on the hull structure.

(2) Reference to documents also includes electronic transmission or storage.

(3) Definition of survey methods which the Surveyor is directly involved in: Patrol, Review, Witness

(A) **Patrol**, the act of checking on an independent and unscheduled basis that the applicable processes, activities and associated documentation of the shipbuilding functions identified in **Table 1** continue to conform to classification and statutory requirements.

(B) **Review**, the act of examining documents in order to determine traceability, identification and to confirm that processes continue to conform to classification and statutory requirements

(C) **Witness** is the attendance at scheduled inspections in accordance with the agreed Inspection and Test Plans to the extent necessary to check compliance with the survey requirements.

## 3. Applications

(1) This Annex covers the survey of all new construction of steel ships intended for classification and for international voyages except for:

(A) those defined in SOLAS I/3
(B) High Speed Craft as defined in I/1.3.1 of the 2000 High Speed Craft Code
(C) Mobile Offshore Drilling Units as defined in I/1.2.1 of the MODU Code

(2) This Annex covers all statutory items, relevant to the hull structure and coating, i.e. Load Line and SOLAS Safety Construction.

(3) This Annex does not cover the manufacture of equipment, fittings and appendages regardless whether they are made inside or outside of the shipyard, examples being as follows. Evidence of acceptance shall be provided by accompanying documentation from class Surveyor at manufacturer and verified at the shipyard:

(A) hatch covers,
(B) doors and ramps integral with the shell and bulkheads,
(C) rudders and rudder stock,
(D) all forgings and castings integral to the hull.

(4) This Annex applies to the installation into the ship, welding and testing of:
(A) the items listed in (3) above
(B) equipment forming part of the watertight and weather tight integrity of the ship.

(5) This Annex applies to the hull structures and coating constructed at any of the following:
(A) shipbuilder's facilities,
(B) sub-contractors at the shipbuilder's facilities,
(C) sub-contractors at their own facilities or at other remote locations

## 4. Qualification and monitoring of personnel

(1) Exclusive Surveyors of the Society, as defined in IACS PR5(Definition of Exclusive Surveyor and Non-Exclusive Surveyor and Procedure for Employment and Control of Non-Exclusive Surveyors), are to confirm through patrol, review and witness as defined in **Par 2** (3), that the ships are built using approved plans in accordance with the relevant rules and statutory requirements.

The Surveyors are to be qualified to be able to carry out the tasks and procedures are to be in place to ensure that their activities are monitored. Details are specified in PR6(Procedure for Activity Monitoring of Surveyors/ISM Code Auditor) and PR7(Procedure for Qualification and Training of Surveyors).

## 5. Survey of the hull structure

(1) **Table 1** provides a list of surveyable items for the hull structure and coating covered by this Annex, including:

(A) description of the shipbuilding functions
(B) classification and statutory survey requirements
(C) survey method required for classification
(D) relevant IACS and statutory requirement references
(E) documentation to be available for the Surveyor during construction

(a) the shipbuilder is to provide the Surveyors access to documentation required by classification, this includes documentation retained by the shipbuilder or other third parties

(b) the list of documents approved or reviewed by the Society for the specific new construction are as follows:
(i) plans and supporting documents
(ii) examination and testing plans
(iii) NDT plans
(iv) welding consumable details
(v) welding procedure specifications
(vi) welding plan or details
(vii) welder's qualification records
(viii) NDT operator's qualification records

(F) Documents to be inserted into the ship construction file. Refer to **Par 10** for details

(G) A list of specific activities which are relevant to the shipbuilding functions. This list is not exhaustive and can be modified to reflect the construction facilities or specific ship type.

(2) Evidence is also to be made available, as required, by the shipbuilder, to the Surveyor whilst the construction process proceeds to prove that the material and equipment supplied to the ship has been built or manufactured under survey relevant to the classification rules and statutory requirements.

## 6. Review of the construction facility

(1) The Society is to familiarize themselves with the yard's production facilities, management processes and safety for consideration in complying with the requirements of **Table 1** using "Shipyard Review Record" of **Appendix 1-12-1** or equivalent prior to any steelwork or construction taking place in the following circumstances:

(A) where the Society has none or no recent experience of the construction facilities - typically after a one year lapse - or when significant new infrastructure has been added,

(B) where there has been a significant management or personnel re-structuring having an impact on the ship construction process,

(C) or where the shipbuilder contracts to construct a vessel of a different type or substantially different in design.

## 7. Newbuilding survey planning

(1) Prior to commencement of surveys for any newbuilding project, the Society is to discuss with the shipbuilder at a kick off meeting the items listed in **Table 1**.

The purpose of the meeting is to review and agree how the list of specific activities shown in **Table 1** is to be addressed. The meeting is to take into account the shipbuilder's construction facilities and ship type including the list of proposed subcontractors. A record of the meeting is to be made, based upon the contents of the **Table 1** - the **Table 1** can be used as the record with comments made into the appropriate column. If the Society has nominated a Surveyor for a specific newbuilding project then the Surveyor is to attend the kick off meeting.

The builder should agree to undertake ad hoc investigations during construction as may be requested by the Society where areas of concern arise and the builder to agree to keep the Society advised of the progress of any investigation. Whenever an investigation is undertaken, the builder is to be requested, in principle, to agree to suspend relevant construction activities if warranted by the severity of the problem.

(2) The records are to take note of specific published Administration requirements and interpretations of statutory requirements.

(3) The shipyard shall be requested to advise of any changes to the activities agreed at the kick off meeting and these are to be documented in the Survey Plan.

E.g. if the shipbuilder chooses to use or change sub-contractors, or to incorporate any modifications necessitated by changes in production or inspection methods, rules and regulations, structural modifications, or in the event where increased inspection requirements are deemed necessary as a result of a substantial non-conformance or otherwise.

(4) Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. Structural fabrication is to be carried out in accordance with IACS Recommendation 47, "Shipbuilding and Repair Quality Standard", or a Recognized Fabrication Standard(RFS) which has been accepted by the Society prior to the commencement of fabrication/ construction. The work is to be carried out in accordance with the Rules and under survey of the Society. *(2021)*

A Classification Society may accept an RFS as an alternative to IACS Rec. 47 provided that (4.1) or (4.2) is complied with as applicable. *(2021)*

(4.1) Where a RFS is well established and has well documented history (3 or more years prior to the new vessel contract) of successful application to similar designs as the new vessel and that history is for the same Shipyard as the new vessel.

Then the Shipyard is to create a summary document referencing the RFS to be used in construction and highlighting any limitations to usage of the selected RFS.
This summary document is to be included with the "record of kick-off meeting" for the vessel.

The summary document is also to be included in the SCF, (for Tankers and Bulk Carriers subject to SOLAS Chapter II-1 Part A-1 Regulation 3-10 per App 12-2-2, Table A Tier II Item 11), as applicable.

(4.2) Where a RFS is new or revised or otherwise not as per (4.1) the following steps are to be carried out:

(a) The tolerances and fabrications standards of the RFS are to be compared with those of Rec. 47. Any that are less stringent than those of Rec. 47 are to be identified.

(b) The tolerances and fabrication standards of the RFS identified in (4.2) (a) are to be assessed to determine the acceptability for use and/or any restrictions for usage for the subject (or proposed) design. Details of how the acceptability for use and/or restrictions are to be recorded, and,

(c) A summary document including the outcomes of (4.2) (a) and (b) is to be compiled. This document is to also include a reference to the RFS, details of the tolerance and fabrication standards not analysed as part of (4.2) (b) and any limitations to the usage of the RFS.

The summary document is to be included with the "record of the kick-off meeting" of the vessel. The summary document is also to be included in the SCF, (for Tankers and Bulk Carriers subject to SOLAS Chapter II-1 Part A-1 Regulation 3-10 per App 2, Table A Tier II Item 11), as applicable. (2021)

(5) The kick-off meeting may be attended by other parties(owner, administrations, etc.) as defined in IACS PR3(Transparency of Classification and Statutory Information) subject to agreement by the shipbuilder.

(6) In the event of series ship production*, the requirement for a kick off meeting in (1) above may be waived for the second and subsequent ships provided that no changes to the specific activities agreed in the kick off meeting for the first ship are introduced. If any changes are introduced, these are to be agreed in a new dedicated meeting and documented in a record of such meeting.

* Series Ship Production:
Vessels in the series subsequent to the first one (prototype), i.e. sister ships built in the same shipyard. *(2022)*

## 8. Examination and test plan for newbuilding activities

(1) The shipbuilder is to provide plans of the items which are intended to be examined and tested. These plans need not be submitted for approval and examination at the time of the kick off meeting. They are to include: *(2020)*

(A) proposals for the examination of completed steelwork - generally referred to as the block plan and are to include details of joining blocks together at the pre-erection and erection stages or at other relevant stages (for reference)

(B) proposals for fit up examinations where necessary (for approval)
(C) proposals for testing of the structure(leak and hydrostatic) as well as for all watertight and weathertight closing appliances (for approval)

(D) proposals for non-destructive testing (for approval)
(E) any other proposals specific to the ship type or to the statutory requirements. (for approval)

(2) The plans and any modifications to them are to be submitted to the Surveyors in sufficient time to allow review before the relevant survey activity commences.

(3) In addition to above (1) and (2), for tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, see also **Appendix 1-12-2** to this Annex.

## 9. Proof of the consistency of surveys

(1) The Society is to be able to provide evidence, e.g. through records, check lists, inspection and test records, etc. that its Surveyors have complied with the requirements of the newbuilding survey planning and duly participated in the relevant activities shown in the shipbuilder's examination and test plans.

(2) In addition, the Society is to maintain records of deficiencies found during the patrolling activities required in **Table 1** and described in **Par 2** (3) (A). Records shall include the date when deficiency was found, description of the deficiency and the date the deficiency was cleared.

## 10. Ship Construction File

The purpose of this paragraph are applicable to all ships except the tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10 for which **Par 3** of **Appendix 1-12-2** to this Annex is to be applied.

(1) The shipbuilder is to deliver documents for the Ship Construction File. In the event that items have been provided by another party such as the shipowner and where separate arrangements have been made for document delivery which excludes the shipbuilder, that party has the responsibility. The Ship Construction File shall be reviewed by the Surveyor for content in accordance with the requirements of (2) below.

(2) It is recognised that the purpose of documents held in the Ship Construction File on board the ship, is to facilitate inspection(survey) and repair and maintenance, and, therefore, is to include in addition to documents listed in **Table 1**, but not be limited to:

(A) as-built structural drawings including scantling details, material details, and, as applicable, wastage allowances, location of butts and seams, cross section details and locations of all partial and full penetration welds, areas identified for close attention(for general dry cargo ships, liquefied gas carriers and ships subject to the enhanced survey programme) and rudders,

(B) manuals required for classification and statutory requirements, e.g. loading and stability, bow doors and inner doors and side shell doors and stern doors - operations and maintenance manuals(IACS UR S8(Bow Doors and Inner Doors) and S9(Side Shell Doors and Stern Doors))

(C) ship structure access manual, as applicable,

(D) copies of certificates of forgings and castings welded into the hull(IACS UR W7(Hull and Machinery Steel Forging) and W8(Hull and Machinery Steel Casting)),

(E) details of equipment forming part of the watertight and weathertight integrity of the ship, *(2021)*

a) a Cable Transit Seal Systems Register, to be prepared by the shipbuilder for watertight cable transits. The Register can be in either a hard copy or digitized media.
For an example of a register see Appendix 1-12-5 "Recommendatory Sample - Cable Transit Seal Systems Register".

It is to include a marking/identification system, documentation referencing manufacturer manual(s) for each type of cable transit installed, the Type Approval certification for each type of transit system, applicable installation drawings, and a recording of each installed transit documenting the as built condition after final inspection in the shipyard. This is to include sections to record any inspection, modification, repair and maintenance.

(F) tank testing plan including details of the test requirements(IACS UR S14(Testing Procedures of Watertight Compartments)),

(G) corrosion prevention specifications(IACS UR Z8(Corrosion Protection Coating for Salt Water Ballast Spaces) and Z9(Corrosion Protection Coatings for Cargo Hold Spaces on Bulk Carriers)),

(H) details for the in-water survey, if applicable, information for divers, clearances measurements instructions etc., tank and compartment boundaries,

(I) docking plan and details of all penetrations normally examined at drydocking.

(J) Coating Technical File, for ships subject to compliance with the IMO Performance Standard for Protective Coatings(PSPC) as a class requirement under the IACS Common Structural Rules.

Table 1 Hull Surveyable Items Activities Table

Appendix 1-12-1 Shipyard Review Record

Appendix 1-12-2 Requirements for Tankers and Bulk Carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10(Goal-based ship construction standards for bulk carriers and oil tankers)

Appendix 1-12-3 Ship Construction File Form Example

Appendix 1-12-4 Representative critical areas by ship type *(2018)*

Appendix 1-12-5 Recommendatory Sample - Cable Transit Seal Systems Register *(2021)*

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| | Shipbuilding quality control function | | | | | | | | |
| 1 | Welding | | | | | | | | |
| 1.1 | Welding consumables | Classification approved separately at the manufacturer | Review approval status and patrol, verify storage, handling and treatment in accordance with manufacturer's requirements | UR W17 | | Consumable specification and approval status | Not required | Identify consumables against approved list | |
| | | | | | | | | Verify temporary and permanent storage facilities | E.g. kept dry, covered, where applicable heated |
| | | | | | | | | Verify traceability | E.g. random batch number checking |

| Table 1 Surveyable Items Activities Table | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
| 1.2 | Welder qualification | Qualified welders | Review of welder certification and patrol | Rec 47 | | Shipyards records with individual's identification | Not required | Verify welder qualification standard, e.g. class or recognised standard approval | |
| | | | | | | | | Verify welder approved for weld position | |
| | | | | | | | | Verify validity of qualification certificate | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 1.3 | **Welding – mechanical properties (welding procedures)** | All weld joint configurations, positions and materials to be covered by weld procedures approved by the classification society or by another IACS member available | Review and patrol | UR W28 | | Approved weld procedure specification and welding plan relevant to the ship project or process | Not required | Verify procedures are available at relevant workstations | |
| | | The classification society witnesses all new weld procedure qualification tests carried out in the shipyard whenever the classification society is surveying in the shipyard | Witness | | | | | Verify weld procedures records have been approved and cover all weld processes and positions in accordance with classification or recognised standards and are available for the Surveyors reference | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 1.3a | **Welding equipment** | Correctly calibrated and maintained | Patrol and review | | | Shipbuilders maintenance and calibration records | Not required | Verify condition of machinery and equipment | |
| | | | | | | | | Verify machines are calibrated by appropriate staff | |
| | | | | | | | | Verify calibration carried out in accordance with manufacturer's recommendations | |
| | | | | | | | | Verify calibration in accordance with maintenance schedule | |
| 1.3b | **Welding environment** | Satisfactory environment | Patrol | Rec 47 | | | Not required | Verify welding areas clean, dry, well lit | |
| | | | | | | | | Confirm relevant measures taken for any pre or post heat treatment, drying of surfaces prior to welding | |
| | | | | | | | | Confirm shielding gases, fluxes protected | |
| 1.3c *(2021)* | **Welding supervision** | Sufficient number of skilled supervisors | Review and patrol | UR W33, Rec 47 | | | | Verify supervision is effective | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 1.4 *(2021)* | **Welding-surface discontinuities** | Substantially free from significant indications, satisfactory profile and size | Visual examination, surface detection techniques, review of documents and patrol of operator | UR W33, Rec 47 | | Shipbuilders and recognised standards and Rules as applicable, welding and NDE plans, NDE reports, operator qualifications | Not required | Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure | |
| | | | | | | | | Verify NDE carried out in accordance with approved plans where applicable | |
| | | | | | | | | Verify suitability of NDE methods | |
| | | | | | | | | Verify operators suitably qualified particularly where sub-contractors have been employed | |
| | | | | | | | | Verify NDE is carried out according to the acceptable process | |
| | | | | | | | | Review NDE records | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 1.5 *(2021)* | **Welding - embedded discontinuities** | NDE is to be carried out by qualified operators capable of ensuring that welds are substantially free from significant indications. | Radiography and ultrasonic testing, review of documents and patrol of operator, examination of films | UR W33, Rec 47 | | Shipbuilders and recognised standards and Rules as applicable, welding and NDE plans, NDE reports, operator qualifications | Not required | Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure | |
| | | | | | | | | Verify NDE carried out in accordance with approved plans where applicable | |
| | | | | | | | | Verify suitability of NDE methods | |
| | | | | | | | | Verify operators suitably qualified particularly where sub-contractors have been employed | |
| | | | | | | | | Verify that records have been completed and in accordance with recognised standards, e.g. IQI(Image Qualify Indicator) and sensitivity recorded | |
| | | | | | | | | Verify that reports and radiographs have been evaluated correctly by the shipbuilder. Systematic review of radiographs carried out by the Surveyor | |
| | | | | | | | | Verify equipment calibration satisfactory and in accordance with manufacturers and recognised standards requirements | |
| | | | | | | | | Verify NDE is carried out according to the acceptable process | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 2 | **Steel preparation and fit up** | | | | | | | | |
| 2.1 | **Surface preparation, marking and cutting** | Traceability and acceptability of material, check of steel plates & profiles materials type, scantling identification, testing marks | Patrol | Rec 47 | | Material certificates, shipbuilder's marking/cutting production documents at the workstage - documents retained at the facility | Not required | Verify stockyard storage satisfactory | |
| | | | | | | | | Verify material traceability, e.g. stamping identification against material certification, archiving of records | |
| | | | | | | | | Verify transfer marking after treatment line | |
| | | | | | | | | Verify standard of shotblasting and priming | |
| | | | | | | | | Verify suitability of primer | |
| | | | | | | | | Verify that steel grades can be identified | |
| | | | | | | | | Verify machinery adjusted to maintain within IACS or manufacturers recommendations | |
| | | | | | | | | Verify accuracy of marking and cutting | |
| | | | | | | | | Verify storage of piece parts | |

| Table 1 Surveyable Items Activities Table | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
| 2.2 | Straightening | Approval of straightening methods/ procedures against deformation | Patrol and review | Rec 47 | | Recognised standards, approved procedures | Not required | Verify that straightening processes are approved for the grade and type of steel, e.g. tmcp, z plate | |
| | | | | | | | | Verify that plates and sections are within recognised tolerances | |
| 2.3 | Forming | Maintain material properties. Acceptance of forming method against unproper deformations | Patrol | Rec 47 | | Shipbuilders procedure for hot forming | Not required | Verify that temperature control is exercised by the operator | |
| | | | | | | | | Verify that suitable methods of temperature control are available when forming special steels and materials | |
| | | | | | | | | Verify that forming processes are acceptable | |
| 2.4 | Conformity with alignment/fit up/gap criteria | Check alignment/fit up/gap against reference standards | Patrol | Rec 47 | | Shipbuilders and recognised standards and Rules as applicable | Not required | Verify the processes to ensure satisfactory fit up and alignment at all workstations | |
| | | | | | | | | Verify that edge preparations are re-instated where lost during fitting operations | |
| | | | | | | | | Verify remedial procedures are in place to compensate for wide gaps and alignment deviations | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 2.5 *(2018)* | **Conformity for critical areas [1], when defined, with alignment/fit up or weld configuration** | Check alignment/fit up/gap against approved drawings | Witness and review | Rec 47 | | Shipbuilders and recognised standards and Rules as applicable, approved plan or standard, builder's records | Approved plans of critical areas if applicable | Verify that the information relevant to the latest approved drawings is available at the workstations | |
| | | | | | | | | Verify the processes to ensure satisfactory fit up and alignment at all workstations | |
| | | | | | | | | Verify that edge preparations are re-instated where lost during fitting operations | |
| | | | | | | | | Verify remedial procedures are in place to compensate for wide gaps and alignment deviations | |

(Remarks) *(2018)*

[1] For the critical areas, the following information are available:

a) The approved Hull Construction Monitoring Plan, in case the ship assigned with "Sea Trust(HCM)" notation as Hull Construction Monitoring Procedure or,

b) Ship structure access manual, if applicable or,

c) other references *(2020)*

i) Representative critical areas by ship type(refer to Annex 1-12-4) or,

ii) The following publications for critical structural areas, where applicable:

- Oil Tankers : Guidance Manual for Tanker Structures by TSCF or Guidelines for Surveys, Assessment and Repair of Hull Structures By IACS(Rec 96) or A.1047(27) (2011 ESP Code), as amended.
- Bulk Carriers : Bulk Carriers Guidelines for Surveys, Assessment and Repair of Hull Structure by IACS(Rec 76) or A.1047(27)(2011 ESP Code) as mended.
- General Dry Cargo Ships : Guidelines for Surveys, Assessment and Repair of Hull Structure By IACS(Rec. 55)
- Container Ship : Guidelines for Surveys, Assessment and Repair of Hull Structure By IACS(Rec. 84) etc.

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 3 | **Steelwork process, e.g. sub assembly, block, grand and mega block assembly, pre-erection and erection, closing plates** | Compliance with approved drawings, visual examination of welding and material, check alignment and deformations | Patrol of the process and witness of the completed item | Rec 47 | | Approved plans, shipbuilders inspection records, Shipbuilders and recognised standards and Rules as applicable, construction plan (steelwork sub-division) | | Verify that the information relevant to the latest approved drawings is available at the workstations | |
| | | | | | | | | Verify that correct weld sizes have been adopted | |
| | | | | | | | | Verify operation of the welding processes at the different work stages is satisfactory | |
| | | | | | | | | Verify that piece parts are identifiable | |
| | | | | | | | | Verify that fit ups are within recognised tolerances | |
| | | | | | | | | Verify that correct welding requirements specified in reference 1 of this table have been adopted | |
| | | | | | | | | Verify processes for closing plates etc. are acceptable | |
| | | | | | | | | Confirm that steelwork is in accordance with the approved plan | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 4 | **Remedial work and alteration** | Welding, check against deformation, alignment | Review records and witness | Rec 47 | | Permanent record of shipyard surveyable item | | Verify that records have been maintained of significant deviations from the approved plans, for situations such as mis cut openings, re-routing outfit items | |
| | | | | | | | | Verify that all deviations brought to the attention of the classification society by the shipbuilder are acceptable | |
| 5 | **Tightness testing, including leak and hose testing, hydropneumatic testing** | Absence of leaks | Review and witness of the test | UR S14 | Reg. II-1/11 of SOLAS as amended | Approved tank testing plan, shipbuilders inspection records | Approved tank testing plan | Confirm that tank testing is carried out in accordance with the approved plan | |
| | | | | | | | | Confirm the methods used to carry out leak testing | |
| | | | | | | | | Confirm that correct test pressures maintained for leak, hose and hydro and hydropneumatic testing is satisfactory | |
| | | | | | | | | Verify that adequate records of the tank testing have been maintained | |
| 6 | **Structural testing** | Structural adequacy of the design | Review and witness of the test | UR S14 | Reg. II-1/11 of SOLAS as amended | Approved tank testing plan, shipbuilders inspection records | Approved tank testing plan | Confirm that tank testing is carried out in accordance with the approved plan | |
| | | | | | | | | Confirm that correct test pressures maintained for testing is satisfactory | |
| | | | | | | | | Verify that adequate records of the tank testing have been maintained | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 7 *(2019)* | Corrosion protection systems, e.g. coatings, cathodic protection, impressed current except for coating system subject to PSPC | Salt water ballast tanks with boundaries formed by the hull envelope, and also bulk carrier hold internal surfaces, coamings and hatch covers shall have an efficient protective coating. Safety aspects of cathodic systems to be dealt with separately. | Review and report on builder's & manufacturer's documentation | UR Z8 and Z9, UI SC122, UR F1 | Reg. II-1/3-2 of SOLAS as amended | Manufacturer's and builder's specification | Corrosion prevention specifications | Verify that applied coatings are approved and review records of application | |
| | | | | | | | | Verify that adequate records have been maintained and copied to the ship construction file | |
| | Application Antifouling Systems | | Review | | AFS Convention | Painting Specification | Painting Specification and Mfg Declaration | Verify that adequate records have been maintained and copied to the ship construction file | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 7.1 | Application of Protective Coatings for Dedicated Seawater Ballast Tanks in all Types of Ships and Double-Side Skin Spaces of Bulk Carriers subject to PSPC | Monitor implementation of the coating inspection requirements | Patrol and review | UI SC223 | Reg. II-1/3-2 of SOLAS as amended | Signed and verified Tripartite Agreement | Coating Technical File | Verify that applied coatings are approved and review records of application in accordance with Chapter 7 of Annex to MSC.215(82) | |
| 8 | Installation, welding and testing of the following | | | | | | | | |
| 8.1 | Hatch covers | Tightness and securing | Witness | UR S14 & Rec 14 | Reg. 13-14-15 and 16 of ILLC '66 | Approved tank testing plan, shipbuilders inspection records | Details required, structural drawings | Confirm leak test of hatch covers | |
| | | | | | | | | Confirm operation and securing test | |

| Table 1 Surveyable Items Activities Table | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
| 8.2 | Doors and ramps integral with the shell and bulkheads | Tightness and securing | Witness | UR S14 | Reg. II-1/18 of SOLAS as amended, Reg. 12 and 21 of ILLC '66 | Approved tank testing plan, shipbuilders inspection records | Details required | Confirm leak test | |
| | | | | | | | | Confirm operation and securing test | |
| | | | | | | | | Confirm safety device operation | |
| | | | | | | | | Ensure correct maintenance logs/manuals supplied with the ship construction file | |
| 8.3 | Rudders | Fitting | Witness | UR S14 | | Approved plan, shipbuilders inspection records | Details required, structural drawings | Confirm alignment and mounting and fitting up to the connection to the tiller | |
| | | | | | | | | Confirm function test | |
| | | | | | | | | Verify fitting of pintles and all securing bolts | |
| | | | | | | | | Verify all fit up records including all clearances maintained and placed into ship construction file | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 8.4 | Forgings and castings | Compliance with approved drawings, visual examination of welding and material, check alignment and deformations | Patrol of the process and witness of the completed item | UR W7 & W8 | | Approved plans, shipbuilders inspection records, Shipbuilders and recognised standards and Rules as applicable, construction plan (steelwork sub-division) | Copies of certificates of forgings and castings | Verify casting and forgings against material certificate | |
| | | | | | | | | Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted | |
| | | | | | | | | Verify that material certificates are included in the ship construction file | |
| | Appendages | | | | | | | Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted | |

Table 1 Surveyable Items Activities Table

| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
|---|---|---|---|---|---|---|---|---|---|
| 8.5 | **Equipment forming the watertight and weathertight integrity of the ship, e.g. overboard discharges, air pipes, ventilators** | Tightness and securing | Witness | | Reg. II-1/16 and Reg. II-1/16-1 of SOLAS as amended; Reg. 17-18-19-20-22-23 of ILLC '66 | Approved tank testing plan, shipbuilders inspection records | Details required | Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted | |
| | | | | | | | | Verify Compliance with Load line Convention 1966 as amended - i.e. all fittings in accordance with the record of freeboard assignment | |
| | | | | UR P3 | | | | Verify air pipes, vents etc closing device are approved type | |
| | | | | | | | | Verify material certificates for overboard discharges where applicable | |
| | | | | | | | | Verify record of freeboard assignment and all material certificates included in the ship construction file | |
| | **Freeboard marks and draft marks** | Within allowable tolerances and in accordance with the freeboard assignment | Witness | UI LL4 | Reg. 4-5-6-7 and 8 of ILLC '66 | | Details required | Verify freeboard marks in accordance with load line assignment | |
| | | | | | | | | Verify draft marks in accordance with the agreed tolerances specified by the builder unless more onerous flag state requirements | |

| Table 1 Surveyable Items Activities Table | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reference | Shipbuilding function | Survey Requirements for Classification | Survey Method required for Classification | IACS reference* | Statutory requirements and relevant reference | Documentation available to classification Surveyor during construction | Documentation for ship construction file | Specific activities | Classification Society proposals for the project |
| | **Principal dimensions** | Within allowable tolerances | Review and witness | Rec 47 | | | Details required | Verify principal dimensions in accordance with recognised standard | |
| | | | | | | | | Verify dimensions included in ship construction file | |
| | **Safety Construction certification** | No outstanding imperfections or defects | Witness | | Reg. I/7 or Reg. I/10 of SOLAS as amended, as appropriate | | | Verify that Administration requirements have been incorporated into the hull structure | |
| 8.6 *(2021)* | **watertight cable transit seal systems** | compliance with (type)approved drawings, visual examination of fitting, check alignment and securing | patrol of the process and witness of the completed item | | Reg. II-1/13 and 13-1 of SOLAS as amended | shipbuilder's inspection records, manufacturer's specification | Cable Transit Seal Systems Register | Verify that correct welding and fit up requirements, including as specified in reference 1, 2.4 and 2.5 of this table have been adopt5ed | |
| | | | | | | | | Verify watertight cable transit seal systems are type approved | |
| | | | | | | | | Verify the format and content of the Register | |

| | |
|---|---|
| Shipbuilder's name | |
| Project | |
| Project duration | |
| Kick off meeting date | |
| Representing builder | |
| Representing Class Society | |

* IACS Recommendations are not mandatory requirements.

# 〈 Supplement of Table 1 〉

- Prior to commencement of survey for any newbuilding project, the Society is to discuss with the shipbuilder at a kick off meeting the items listed in **Table 1**. The purpose of the meeting is to review and agree how the list of specific activities shown in **Table 1** is to be addressed. The meeting is to take into account the shipbuilder's construction facilities and ship type including the list of proposed subcontractors.

- A record of the meeting is to be made, based upon the contents of the **Table 1** - the **Table 1** can be used as the record with comments made into the appropriate column.

- The shipyard shall be requested to advise of any changes to the activities agreed at the kick off meeting and these are to be documented in the Survey Plan. (E.g. if the shipbuilder chooses to use or change sub-contractors, or to incorporate any modifications necessitated by changes in production or inspection methods, rules and regulations, structural modifications, or in the event where increased inspection requirements are deemed necessary as a result of a substantial non-conformance or otherwise.)

- In the event of series ship production*, the requirement for a kick off meeting may be waived for the second and subsequent ships provided that no changes to the specific activities agreed in the kick off meeting for the first ship are introduced. If any changes are introduced, these are to be agreed in a new dedicated meeting and documented in a record of such meeting.

  * Series Ship: See **Pt 1, Ch 1, 101. 5.** of the Rules.

- Additional meeting items, etc. :

| No. | Items | Result | |
|---|---|---|---|
| 1 | If the Society has nominated a Surveyor for a specific newbuilding project then the Surveyor is to attend the kick off meeting. | A Surveyor has nominated and attended. | (Yes / No) |
| 2 | The kick-off meeting may be attended by other parties, such as owner, administrations, etc. subject to agreement by the shipbuilder. | Owner, administrations, etc. has attended.<br>Attended by : | (Yes / No) |
| 3 | The builder should agree to undertake ad hoc investigations during construction as may be requested by the Society where areas of concern arise and the builder to agree to keep the Society advised of the progress of any investigation.<br>(The builder is to be requested to agree to suspend relevant construction activities if warranted by the severity of the problem) | The builder was requested and agreed. | (Yes / No) |
| 4 | Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. | Shipbuilding quality standards was reviewed and agreed.<br>Shipbuilding quality standards : | (Yes / No) |
| 5 | The records are to take note of specific published Administration requirements and interpretations of statutory requirements. | The specific published Administration requirements and interpretations of statutory requirements is exist and the relevant documents are attached. | (Yes / No) |

# Appendix 1-12-1 Shipyard Review Record

| Name of Shipyard | Date |
|---|---|
| | |

## 1. Details of any management systems

| Obtained Approval | Certified by | Expiry Date | Remarks (scope, etc.) |
|---|---|---|---|
| ISO-9001 | | | |
| ISO 14001 | | | |
| ISO 45001 | | | |
| Other: | | | |

## 2. Construction Equipment: (Documents such as a brochure of shipyard can be attached in lieu of completing this section.)

### 2.1 Building Berth (B) or Dock (D)

* In case of berth, Depth is not applicable.

| B / D | Name | Length (m) | Width (m) | Depth* (m) | Building Capacity (Gross Tonnage) | Crane (Ton x No.) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

### 2.2 Outfitting Quays

| Name | Length (m) | Width (m) | Depth (m) | Berthing Capacity (Gross Tonnage) | Crane (Ton x No.) |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

### 2.3 Main Fabrication and Erection Facilities

(1) Marking and cutting of steel plates(including internal members)
- Marking method ( Manual, Photo x _____, EPM x _____, NC x _____ others _____ )
- NC cutting machine ( Gas x _____, Plasma x _____, Laser x _____ )
  Control procedure of NC ( On-line, other )
- Cutting equipment ( Edge planer x _____, Roll-shear x _____ )

(2) Marking and cutting of section bar
- Marking method ( Manual, NC )
- Marking of reference curved line ( Manual, NC )
- Cutting method ( Manual, NC )
- In case of NC ( Gas x _____, Plasma x _____ )

(3) One-side automatic welding machine ( Yes, No )
- Type of welding machine ( Flax Backing x _____, Flux and Copper Backing x _____ other _____ )
- Existence of special surface plate for plate welding ( Yes, No )

(4) Fillet welding machine ( Gravity, Automatic ) Percentage of automatization except gravity: about ____%
- Line welder ( No, Yes: submerged arc x _____ heads, $CO_2$ x _____ heads )
- Small automatic fillet welding machine ( No, Yes: Name: _____ x _____ )
- Welding robot ( No, Yes: Portal x _____, Rectangular x _____, Articulated x _____ )

(5) Painting equipment
- Plate shot blasting/primer coating machine ( No, Yes: Max. Width _____ m, Length _____ m )
- Section bar shot blasting/primer coating machine ( No, Yes: Max. Length _____ m )
- Special coating factory ( No, Yes: _____ m x _____ m x _____ sections )

(6) Vertical automatic welding machine ( No, Yes: EG x _____, SEG x _____, ES x _____ )
EG: Electrogas SEG: Simplified Electrogas ES: Electroslag

(7) Other main fabrication facilities

### 3. Shipyard control of Qualified Welders

#### (1) Normal steel

| | | certification | traceability | supervision | maintenance of qualification |
|---|---|---|---|---|---|
| Shipyard workers | confirm system in place | Yes/No | Yes/No | Yes/No | Yes/No |
| Subcontracted workers | confirm system in place | Yes/No | Yes/No | Yes/No | Yes/No |

### 4. Feature of Construction Procedure

(1) Subcontract of hull blocks(weight)
- Sub members ( No, Yes: Ratio of subcontracted works _____ %, No., of subcontractors _____ )
- Blocks ( No, Yes: Ratio of subcontracted works _____ %, No., of subcontractors _____ )

(2) Method of plate block assembly
- Method fitting and welding longitudinals and transverse webs on jointed panels
- Method welding longitudinals on jointed panels prior to fitting and welding transverse webs
- Method fitting and welding a frame consists of longitudinals and transverse webs on jointed panels
- Method jointing panels with pre-assembled longitudinals by welding prior to fitting and welding transverse webs
- Other (please specify in (5) below)

(3) - pre-erection outfitting carried out
grand block/mega block adopted

Method of erection at building berth/dock
- Max. weight of loading block: ton
- Construction method in building dock/berth/land construction etc. ( 1 ship, 1.5 ships: Semi-tandem, dual entrance )
- Block loading process ( single starting block, multi starting blocks, inserting block : No, Yes )

(4) Final dock ( No, Yes: In-house, Other place of the same company, Use other company )

(5) Other feature of construction procedure

**5. Quality Control System: (Refer to Quality Manual, if available.)**

| Item and description | Result | Remarks |
|---|---|---|
| (1) Existence of the organization chart including the departments of design, purchasing, manufacturing and quality assurance<br>- Are the function, responsibility and competence of the organization clear? | | |
| (2) Quality control organization<br>- Existence of quality control organization<br>- Number of employees in this organization<br>- Existence of procedures or plans related to tests and inspections | _____ persons including the chief | |
| (3) Pre-inspection system of shipyard<br>- Is pre-inspection carried out prior to Class inspection?<br>- Are pre-inspectors assigned? (Check the list.)<br>- Number of pre-inspectors (related to hull only)<br>- Are inspection results marked on the object and/or recorded in the checklist? | _____ persons | |
| (4) Records of inspections and tests<br>- Are records made and kept properly?<br>- Does the responsible person verify the records?<br>- Can the adoption of necessary corrective actions against non-conformity happened be checked? | | |
| (5) Condition at the time of the surveys in the presence of class Surveyors<br>- Is the schedule of the surveys changed often?<br>- Are pre-inspection, shipyard inspection and repairs completed beforehand?<br>- Are the sufficient preparations for surveys such as scaffoldings, lighting, cleaning made? | | |
| (NOTES)<br>Above-mentioned (3) and (4) include the acceptance inspection of subcontracted items. | | |

### 6. Measures for Safety and Health

| Item and description | Result | Remarks |
|---|---|---|
| (1) Are conditions of scaffolding, nets, safety belt, lighting and ventilation good? | | |
| (2) Does sufficient attention paid for radiographic examination and operation of cherry picker? | | |
| (NOTES) | | |

### 7. Control System of Non-Destructive Testing(NDT)

| Item and description | Result | Remarks |
|---|---|---|
| (1) Number of NDT supervisors in shipyard (including persons responsible for judging results) | _____ persons | |
| (2) Dependence on subcontracted NDT work<br>- Number of shipyard employees<br>- Number of sub-contractors | <br>_____ persons<br>_____ persons | |
| (3) NDT sub-contractor company's name and official technical qualifications | Name _____<br>(approved by) _____<br>Name _____<br>(approved by) _____ | |
| (4) Grade and number of NDT employees with official technical qualifications in shipyard<br>Specialized in radiography<br>Specialized in ultrasonic<br>Specialized in surface detection | <br>_____ Grade _____ persons<br>_____ Grade _____ persons<br>_____ Grade _____ persons | |
| (5) If non-destructive testings are subcontracted, the grade and number of officially qualified persons<br>Specialized in radiography<br>Specialized in ultrasonic<br>Specialized in surface detection | <br>_____ Grade _____ persons<br>_____ Grade _____ persons<br>_____ Grade _____ persons | |
| (6) Non-destructive testing equipment (in-house)<br>- Number of radiographic equipment<br>- Number of ultrasonic equipment | <br>_____<br>_____ | |
| (NOTES)<br>Even if all works are subcontracted, it is recommendable to attach the qualified person(s) who can verify the works. | | |

## 8. Quality Control on Production Line

| Item and description | Result | Remarks |
|---|---|---|
| **8.1 Preventive measures for misuse of materials** | | |
| (1) Job title of supervisor and person in charge of collating ordered steel and received steel, and checking of mill sheet | Title of supervisor: _____<br>Title of person in charge: _____ | |
| (2) Are means for checking the material grade in hand prescribed for high-grade steels | | |
| (3) Are regulations prescribed for checking the material grade for high-tensile steel and steel for low-temperature applications?<br>Are there regulations for inscribing high tensile steel on the surface of the high tensile steel and special indication for steel for low temperature applications? | | |
| (4) Are procedures for re-using of remaining cut-off mild steel? | | |
| (5) Are there procedures for re-using of remaining cut-off high-tensile steel? | | |
| (6) In the case of (4) and (5) above, can a collation be made with the mill sheet? | | |
| (7) Section of controlling the lists of remaining cut-off steel | Name of section: _____ | |
| (NOTES)<br>- In case of high tensile steel, are means identifying different grades<br>- In the case of (3) and (4) above, are the materials approved by other classes controlled similarly? | | |
| **8.2 Shot blasting/Primer coating** | | |
| (1) Existence of surface preparation standards | | |
| (2) Existence of coating thickness control standards<br>- Existence of thickness measurement records | | |
| (NOTES)<br>- The standard is to include the description related traceability after shot blasting and primer coating. | | |

| | | |
|---|---|---|
| **8.3 Marking and cutting (Assembly work)** | | |
| (1) Existence of standards for accuracy and periodical inspection of tape measures, tapes, stencils, etc. | | |
| (2) Existence of standards for accuracy of cut dimensions and edge preparation | | |
| (3) Existence of standards for finish of cutting face | | |
| (4) What is the frequency and extent of maintenance and inspection carried out for ensuring accuracy of NC cutter and/or flame planer? | | |
| (5) In case of NC, are the disks, tapes etc. maintained in good condition? | | |
| (6) What are the measures adopted and guidance given to make the worker fully conversant with cutting work standards for maintaining accuracy? | | |
| (NOTES)<br>- In case of (2) and (3) above, check items are to include confirmation of edge preparations free from piercing hole.<br>- NC for section bars is also to be in accordance with the above. | | |
| **8.4 Bending and strain free** | | |
| (1) Existence of standards for maximum heating temperatures during water cooling and at the time of bending and distortion removal of steel by quick heating and cooling | | |
| (2) Existence of regulations for plate thickness and bending radius for flange processing | | |
| (3) What are the measures adopted and guidance given to make the worker fully conversant with maintaining quality and accuracy during the bending process? | | |
| (NOTES) | | |

| | | |
|---|---|---|
| **8.5 Control of Welding Procedure** | | |
| (1) Are all welding procedures applied to the ships approved by the Society or other IACS members? | | |
| (NOTES) | | |
| **8.6 Treatment of serious non-conformities** | | |
| (1) Are repair plans submitted to the Society when serious non-conformities happened? | | |
| (2) Were the NDT(RT/UT) plans submitted at appropriate timing? | | |
| (3) Was the extent of tests extended considering the results of the test? | | |
| (NOTES) | | |
| **8.7 Hydrostatic and Watertight Tests** | | |
| (1) Is the test plan submitted to the Society? | | |
| (2) Are vacuum tests applied to? | | |
| (3) Are local air injection tests during sub-assembly works applied to? | | |
| (4) If (2) or (3) above is applied to, are the test procedures approved by the Society? | | |
| (NOTES) | | |

# Appendix 1-12-2
# Requirements for Tankers and Bulk Carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10(Goal-based ship construction standards for bulk carriers and oil tankers)

## 1. Examination and test plan for newbuilding activities

1.1 The shipbuilder is to provide plans of the items which are intended to be examined and tested in accordance with the Society's Rules in a document known as the Survey Plan, taking into account the ship type and design. This Survey Plan shall be reviewed at the time of the kick off meeting, and must include:

1.1.1 a set of requirements, including specifying the extent and scope of the construction survey(s) and identifying areas that need special attention during the survey(s), to ensure compliance of construction with mandatory ship construction standards including:

.1 Type of surveys(visual, non-destructive testing, etc.) depending on location, materials, welding, casting, coating, etc.

.2 Establishment of a construction survey schedule for all assembly stages from the kick-off meeting, through all major construction phases, up to delivery.

.3 Inspection/survey plan, including provisions for critical areas identified during design approval.

.4 Inspection criteria for acceptance.

.5 Interaction with shipyard, including notification and documentation of survey results.

.6 Correction procedures to remedy construction defects.

.7 List of items that would require scheduling or formal surveys.

.8 Determination and documentation of areas that need special attention throughout ship's life, including criteria used in making the determination.

1.1.2 a description of the requirements for all types of testing during survey, including test criteria.

## 2. Design Transparency

2.1 For ships subject to compliance with IMO Res. MSC.287(87)(Adoption of the international goal-based ship construction standards for bulk carriers and oil tankers), IMO Res. MSC. 290(87) (Adoption of amendments to the international convention for the safety of life at sea, 1974, as amended), IMO Res. MSC.454(100) (Revised guidelines for verification of conformity with goal-based ship construction standards for bulk carriers and oil tankers) and IMO MSC.1/Circ. 1343(Guidelines for the information to be included in a ship construction file), readily available documentation is to include the main goal-based parameters and all relevant design parameters that may limit the operation of the ship.

## 3. Ship Construction File(SCF)

3.1 A Ship Construction File(SCF) with specific information on how the functional requirements of the Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers have been applied in the ship design and construction is to be provided upon delivery of a new ship, and kept on board the ship and/or ashore and updated as appropriate throughout the ship's service. The contents of the Ship Construction File are to conform to the requirements below.

3.1.1 The following design specific information is to be included in the Ship Construction File(SCF):

.1 Areas requiring special attention throughout the ship's life(including critical structural areas).

.2 All design parameters limiting the operation of a ship.

.3 Any alternatives to the Rules, including structural details and equivalency calculations.

.4 "As built" drawings and information which are verified to incorporate all alterations approved by the recognized organization or flag state during the construction process including scantling details, material details, location of butts and seams, cross section details and locations of all partial and full penetration welds.

.5 Net(renewal) scantlings for all the structural constituent parts, as built scantlings and voluntary addition thicknesses.

.6 Minimum hull girder section modulus along the length of the ship which has to be maintained throughout the ship's life, including cross section details such as the value of the area of the deck zone and bottom zone, the renewal value for the neutral axis zone.

.7 A listing of materials used for the construction of the hull structure, and provisions for documenting changes to any of the above during the ship's service life.

.8 Copies of certificates of forgings and castings welded into the hull(IACS UR W7(Hull and Machinery Steel Forging) and UR W8(Hull and Machinery Steel Casting)).

.9 Details of equipment forming part of the watertight and weather tight integrity of the ship.

.9.1 A Cable Transit Seal Systems Register, to be prepared by the shipbuilder for watertight cable transits. The Register can be in either a hard copy or digitized media. For an example of a register see Appendix 1-12-5 "Recommendatory Sample Cable Transit Seal Systems Register".

It is to include a marking/identification system, documentation referencing manufacturer manual(s) for each type of cable transit installed, the Type Approval certification for each type of transit system, applicable installation drawings, and a recording of each installed transit documenting the as built condition after final inspection in the shipyard. This is to include sections to record any inspection, modification, repair and maintenance. *(2021)*

.10 Tank testing plan including details of the test requirements(IACS UR S14(Testing Procedures of Watertight Compartments)).

.11 Details for the In-water Survey, when applicable, information for divers, clearances measurements instructions etc., tank and compartment boundaries.

.12 Docking plan and details of all penetrations normally examined at drydocking.

.13 Coating Technical File, for ships subject to compliance with the IMO Performance Standard for Protective Coatings(PSPC[2)]).

3.1.2 Refer to Table A of this Appendix for details of information to be further included. This information has to be kept on board the ship and/or ashore and updated as appropriate throughout the ship's life in order to facilitate safe operation, maintenance, survey, repair and emergency measures.

3.1.3 It is to be noted that parts of the content of the SCF may be subject to various degrees of restricted access and that such documentation may be appropriately kept ashore.

3.1.4 The SCF has to include the list of documents constituting the SCF and all information listed in Table A of this Appendix, which is required for a ship's safe operation, maintenance, survey, repair and in emergency situations. Details of specific information that is not considered to be critical to safety might be included directly or by reference to other documents.

3.1.5 When developing an SCF, all of the columns in Table A of this Appendix have to be reviewed to ensure that all necessary information has been provided.

3.1.6 It may be possible to provide information listed in the annex under more than one Tier II[1)] functional requirement as a single item within the SCF, for example, the Coating Technical File required by the PSPC[2)] is relevant for both "Coating life" and "Survey during construction".

3.1.7 The SCF has to remain with the ship and, in addition, be available to the Society and flag state throughout the ship's life. Where information not considered necessary to be on board is stored ashore, procedures to access this information should be specified in the onboard SCF. The intellectual property provisions within the SCF should be duly complied with.

3.1.8 The SCF should be updated throughout the ship's life at any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structure.

3.2 The SCF shall be reviewed[3)], at the time of new building, in accordance with the requirements of paragraphs 3.1.1 and 3.1.2 and the normal storage location shall be distinguished. *(2018)*

3.2.1 For the SCF stored on board ship, the surveyor is to verify that the information is placed on board the ship, upon completion of ship construction.

3.2.2 For the SCF stored on shore archive, the surveyor is to verify that the information is stored on shore archive by examining the list of information included on shore archive, upon completion of ship construction.

## 4. Determination of number of Surveyor(s)

The Society will assign adequate number of suitable qualified Surveyor(s) for new building projects according to the construction progress of each ship to meet appropriate coverage of the examination and testing activities as agreed in the Survey Plan.

(NOTES)

1) Tier II items means the functional requirements included in the International Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers(GBS), adopted by IMO Res. MSC. 287(87)

2) Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by IMO Res. MSC.215(82), as amended and Performance standard for protective coatings for cargo oil tanks of crude oil tankers, adopted by IMO Res.MSC.288(87), as amended

3) "Review" means the examination of the SCF that is carried out by the surveyor, at the end of the newbuilding process, in order to confirm that:

- drawings and documents required under the paragraph 3. "Ship Construction File(SCF)" of the appendix 1-12-2 plus
- the possible additional drawings/documents provided by the shipyard, as per the Ship Constructional File(SCF) list of drawings/documents are present in the copies of the SCF stored on board and in the ashore archive.

The "review" is not to be intended as an assessment of the drawings/documents in order to verify their compliances with the applicable Rules/Regulations. *(2018)*

## Table A List of information to be included in the Ship Construction File(SCF)

| Tier II items | | Information to be included | Further explanation of the content | Example documents | Normal storage location |
|---|---|---|---|---|---|
| *DESIGN* | | | | | |
| 1 | Design life | • assumed design life in years | • statement or note on midship section | • SCF-specific | on board ship |
| | | | | • midship section plan | on board ship |
| 2 | Environmental conditions | • assumed environmental conditions | • statement referencing data source or Rule (specific rule and data) or;<br>• in accordance with Rule(date and revision) | • SCF-specific | on board ship |
| 3 | Structural strength | | | | |
| 3.1 | General design | • applied Rule(date and revision) | • applied design method alternative to Rule and subject structure(s) | • SCF-specific | on board ship |
| | | • applied alternative to Rule | | • capacity plan | on board ship |
| 3.2 | Deformation and failure modes | • calculating conditions and results; | • allowable loading pattern | • loading manual | on board ship |
| | | • assumed loading conditions | • maximum allowable hull girder bending moment and shear force | • trim and stability booklet | on board ship |
| 3.3 | Ultimate strength | • operational restrictions due to structural strength | • maximum allowable cargo density or storage factor | • loading instrument instruction manual<br>• operation and maintenance manuals | on board ship<br>on board ship |

| | | | | | |
|---|---|---|---|---|---|
| 3.4 | Safety margins | • strength calculation results | • bulky output of strength calculation | • strength calculation | on shore archive |
| | | | • plan showing highly stressed areas(e.g. critical structural areas) prone to yielding and/or buckling | • areas prone to yielding and/or buckling | on board ship |
| | | • gross hull girder section modulus | | | |
| | | • minimum hull girder section modulus along the length of the ship to be maintained throughout the ship's life, including cross section details such as the value of the area of the deck zone and bottom zone, the renewal value for the neutral axis zone | | • general arrangement plan | on board ship |
| | | • gross scantlings of structural constituent parts | • structural drawings | • key construction plans | on board ship |
| | | • net scantlings of structural constituent parts, as built scantlings and voluntary addition thicknesses | • rudder and stern frame | | |
| | | | • structural details of typical members | • rudder and rudder stock plans | on board ship |
| | | | | • structural details | on board ship |
| | | | | • yard plans | on shore archive |
| | | | | • dangerous area plan | on board ship |
| | | • hull form | | | |
| | | | • hull form information indicated in key construction plans | • lines plan | on shore archive |
| | | | • hull form data stored within an onboard computer necessary for trim and stability and longitudinal strength calculations | or | |
| | | | | equivalent | on board ship |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Fatigue life | • applied Rule(date and revision)<br>• applied alternative to Rule | • applied design method alternative to Rule and subject structures | • SCF-specific | on board ship |
| | | • calculating conditions and results;<br>• assumed loading conditions | • assumed loading conditions and rates | • structural details | on board ship |
| | | • fatigue life calculation results | • bulky output of fatigue life calculation | • fatigue life calculation | on shore archive |
| | | | • plan showing areas(e.g. critical structural areas) prone to fatigue | • areas prone to fatigue | on board ship |
| 5 | Residual strength | • applied Rule(date and revision | | • SCF-specific | on board ship |
| 6 | Protection against corrosion | | | | |
| 6.1<br>6.2 | Coating life<br>Corrosion addition | • coated areas and target coating life and other measures for corrosion protection in holds, cargo and ballast tanks, other structure-integrated deep tanks and void spaces | • plans showing areas(e.g. critical structural areas) prone to excessive corrosion | • SCF-specific<br>• Coating Technical File required by PSPC(Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by IMO Res.MSC.215(82), as amended and Performance standard for protective coatings for cargo oil tanks of crude oil tankers, adopted by IMO Res.MSC.288(87), as amended) | on board ship<br>on board ship |
| | | • specification for coating and other measures for corrosion protection in holds, cargo and ballast tanks, other structure-integrated deep tanks and void spaces | | • areas prone to excessive corrosion | on board ship |
| | | • gross scantlings of structural constituent parts<br>• net scantlings of structural constituent parts, as built scantlings and voluntary addition thicknesses | | • key construction plans | on board ship |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Structural redundancy | • applied Rule(date and revision) | | • SCF-specific | on board ship |
| 8 | Watertight and weathertight integrity | • applied Rule(date and revision)<br>• key factors for watertight and weathertight integrity | • details of equipment forming part of the watertight and weathertight integrity | • SCF-specific<br>• structural details of hatch covers, doors and other closings integral with the shell and bulkheads | on board ship<br>on board ship |
| 9 | Human element considerations | • list of ergonomic design principles applied to ship structure design to enhance safety during operations, inspections and maintenance of ship | | • SCF-specific | on board ship |
| 10 | Design transparency | • applied Rule(date and revision)<br>• applicable industry standards for design transparency and IP protection<br>• reference to part of SCF information kept ashore | | • intellectual property provisions<br>• summary, location and access procedure for part of SCF information on shore | on board ship<br>on board ship |
| *CONSTRUCTION* | | | | | |
| 11 | Construction quality procedures | • applied construction quality standard | • recognized national or international construction quality standard | • SCF-specific | on board ship |
| 12 | Survey during construction | • survey regime applied during construction(to include all owner and class scheduled inspections during construction)<br>• information on non-destructive testing | • applied Rules(date and revision)<br>• copies of certificates of forgings and castings welded into the hull | • SCF-specific<br>• tank testing plan<br>• non-destructive testing plan<br>• Coating Technical File required by PSPC | on board ship<br>on board ship<br>on board ship<br>on board ship |

| | | | | | |
|---|---|---|---|---|---|
| *IN-SERVICE CONSIDERATIONS* | | | | | |
| 13 | Survey and maintenance | • maintenance plans specific to the structure of the ship where higher attention is called for | • plan showing highly stressed areas(e.g. critical structural areas) prone to yielding, buckling, fatigue and/or excessive corrosion | • SCF-specific<br>• operation and maintenance manuals(e.g. hatch covers and doors) | on board ship<br>on board ship |
| | | • preparations for survey | • arrangement and details of all penetrations normally examined at dry-docking | • docking plan | on board ship |
| | | • gross hull girder section modulus | • details for dry-docking | • dangerous area plan | on board ship |
| | | • minimum hull girder section modulus along the length of the ship to be maintained throughout the ship's life, including cross section details such as the value of the area of the deck zone and bottom zone, the renewal value for the neutral axis zone | • details for in-water survey | • Ship Structure Access Manual | on board ship |
| | | | | • Means of access to other structure-integrated deep tanks | on board ship |
| | | | | • Coating Technical File required by PSPC | on board ship |
| | | • gross scantlings of structural constituent parts | | • key construction plans | on board ship |
| | | • net scantlings of structural constituent parts, as built scantlings and voluntary addition thicknesses | | • rudder and rudder stock | on board ship |
| | | | | • structural details | on board ship |
| | | | | • yard plans | on shore archive |
| | | | • hull form information indicated in key construction plans | • lines plan | on shore archive |
| | | • hull form | | or<br>equivalent | on board ship |
| 14 | Structural accessibility | • means of access to holds, cargo and ballast tanks and other structure-integrated deep tanks | • plans showing arrangement and details of means of access | • Ship Structure Access Manual | on board ship |
| | | | | • means of access to other structure-integrated deep tanks | on board ship |

| *RECYCLING CONSIDERATIONS* | | | | | |
|---|---|---|---|---|---|
| 15 | Recycling | • identification of all materials that were used in construction and may need special handling due to environmental and safety concerns[9] | • list of materials used for the construction of the hull structure[9] | • SCF-specific | on board ship |

(NOTES)

1. "SCF-specific" means documents to be developed especially to meet the requirements of these GBS guidelines (MSC.1/Circ.1343).
2. "Key construction plans" means plans such as midship section, main O.T. and W.T. transverse bulkheads, construction profiles/plans, shell expansions, forward and aft sections in cargo tank(or hold) region, engine-room construction, forward construction and stern construction drawings.
3. "Yard plans" means a full set of structural drawings, which include scantling information of all structural members.
4. "Hull form" means a graphical or numerical representation of the geometry of the hull. Examples would include the graphical description provided by a lines plan and the numerical description provided by the hull form data stored within an onboard computer.
5. "Lines plan" means a special drawing which is dedicated to show the entire hull form of a ship.
6. "Equivalent(to Lines plan)" means a set of information of hull form to be indicated in key construction plans for SCF purposes. Sufficient information should be included in the drawings to provide the geometric definition to facilitate the repair of any part of the hull structure.
7. "Normal storage location" means a standard location where each SCF information item should be stored. However, those items listed as being on board in the table above should be on board as a minimum to ensure that they are transferred with the ship on a change of Owner.
8. "Shore archive" is to be operated in accordance with applicable international standards.
9. " List of materials used for the construction of the hull structure" is to be in accordance with the following:
   1) "Materials may need special handling due to environmental and safety concerns" means the hazardous materials listed in Appendix 1 and 2 of Ship Recycling Convention.
   2) The list of materials is to include information on at least name of hull structures, location, name of materials, parts where the materials are used and approximate quantity.

## Appendix 1-12-3 Ship Construction File Form Example

# Ship Construction File

| | |
|---|---|
| M / V | " " |
| IMO No.: | |
| Hull No.: | |

Shipbuilder :

The shipbuilder is to deliver documents for the Ship Construction File. In the event that items have been provided by another party such as the shipowner and where separate arrangements have been made for document delivery which excludes the shipbuilder, that party has the responsibility.

It is recognized that the purpose of documents held in the Ship Construction File on board the ship, is to facilitate inspection(survey) and repair and maintenance, and therefore, is to include but not to limited to:

* : requirements for tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10(Goal-based ship construction standards for bulk carriers and oil tankers) only

1. Final Drawings:

As-built structural drawings including scantling details, material details, and, as applicable, wastage allowances, location of butts and seams, cross section details and locations of all partial and full penetration welds, areas identified for close attention(for general dry cargo ships, liquefied gas carriers and ships subject to the enhanced survey programme) and rudders

And the followings are to be included.

(1) Approved plans of critical areas if applicable
(2) Hatch cover structural drawings and details if applicable
(3) Rudder structural drawings and details
(4) Freeboard marks and draft marks details
(5) Principal dimensions details
(6) Areas requiring special attention throughout the ship's life(including critical structural areas)*
(7) All design parameters limiting the operation of a ship*
(8) Any alternatives to the Rules, including structural details and equivalency calculations*
(9) Plan showing highly stressed area(e.g. critical structural area) prone to yielding, buckling, fatigue and/or excessive corrosion*
(10) Dangerous area plan*
(11) Non-destructive testing plan*

List of Final Drawings

| Serial No. | DWG No. | Title of DWG | DWG Box No. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

2. Manuals required for classification and statutory requirements, e.g. loading and stability, bow doors and inner doors and side shell doors and stern doors - operations and maintenance manuals(IACS UR S8(Bow Doors and Inner Doors) and S9(Side Shell Doors and Stern Doors)), including ship structures access manual, as applicable.

List of Manuals

| Serial No. | Manual No. | Title of Manual | Manual Box No. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

3. Copies of certificates of forgings and castings welded into the hull(IACS UR W7(Hull and Machinery Steel Forging) and W8(Hull and Machinery Steel Casting))

List of Copies of Certificates

| Serial No. | Cert. No. | Title of Certificate | Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

(Note: Copies of Certificates are attached)

4. Details of equipment forming part of the watertight and weather tight integrity of the ship(e.g. overboard discharges, air pipes, ventilators, cable transit sealing systems) *(2021)*

1) List of Drawings or Copies of Certificates

| Serial No. | DWG/Cert. No. | Title of DWG/Certificate | Box No. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

(Note: Details(drawings, copies of certificates, etc.) of the relevant equipments are attached, or kept at specified box)

2) A cable transit sealing systems register (refer to Appendix 1-12-5) *(2021)*

5. Tank testing plan including details of the test requirements(IACS UR S14(Testing Procedures of Watertight Compartments))

6. Corrosion prevention specifications(IACS UR Z8(Corrosion Protection Coating for Salt Water Ballast Spaces) and Z9(Corrosion Protection Coatings for Cargo Hold Spaces on Bulk Carriers))

7. Details for the in-water survey, if applicable, information for divers, clearances measurements instructions etc., tank and compartment boundaries.

8. Docking plan and details of all penetrations normally examined at drydocking.

9. Coating Technical File, for ships subject to compliance with the IMO Performance Standard for Protective Coatings(PSPC)

10. Lines plan or equivalent(hull form data stored within an onboard computer necessary for trim and stability and longitudinal strength calculations)*

11. Intellectual property provisions*

12. Summary, location and access procedure for part of Ship Construction File(SCF) information on shore*

13. Documents required by Table A in Annex 1-12 of KR Guidance Relating to the Rules for the Classification of Steel Ships, Pt 1 as "SCF-specific"(see, NOTE 1 of the Table A)*

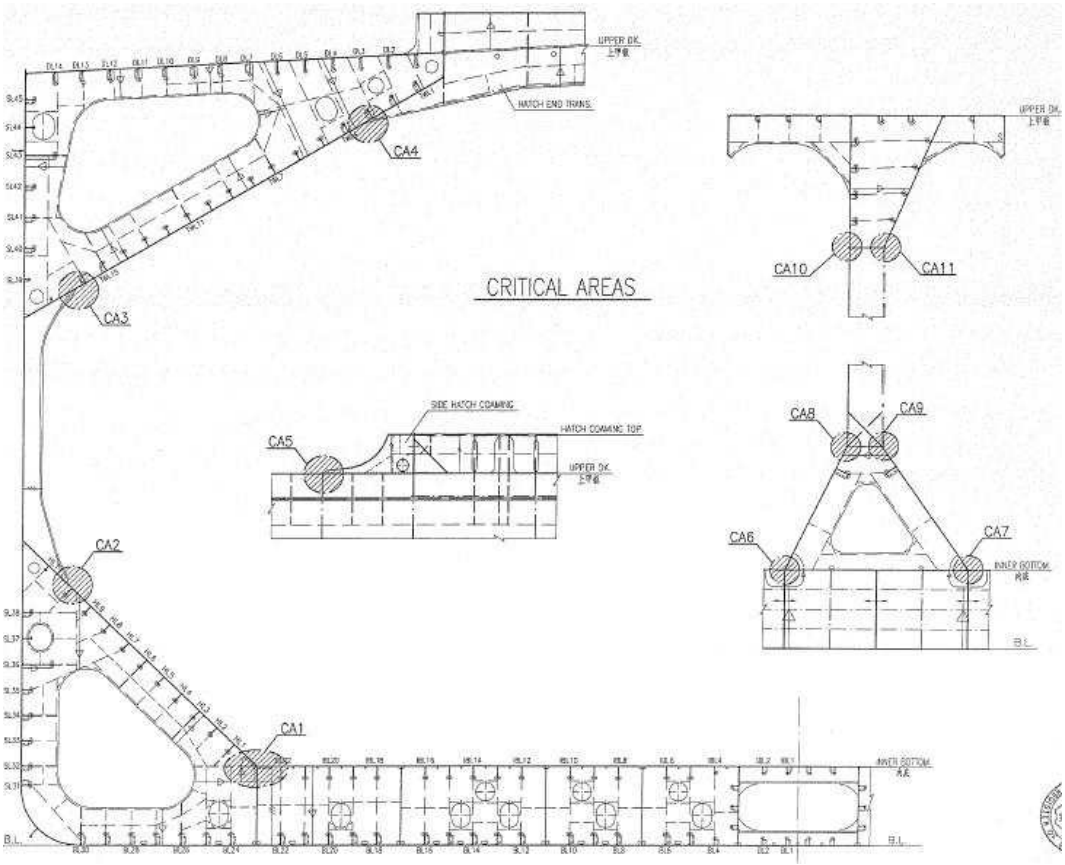
〈For on shore archive〉*

A. Strength calculation
B. Yard plans
C. Lines plan if applicable(see para 10. above)
D. Fatigue life calculation

# Appendix 1-12-4 Representative critical areas by ship type *(2018)*

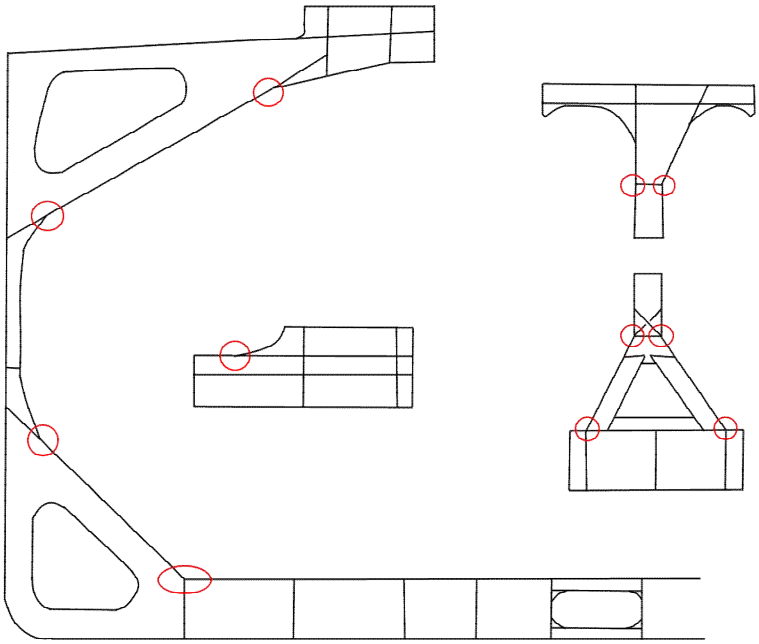
1. Examples of representative critical areas for Bulk Carrier, Oil Tanker, Chemical Tanker, Very Large Crude Oil Carrier, Liquefied Gas Carrier, RoRo Ship, Container Ship are as follows

(1) Bulk Carrier

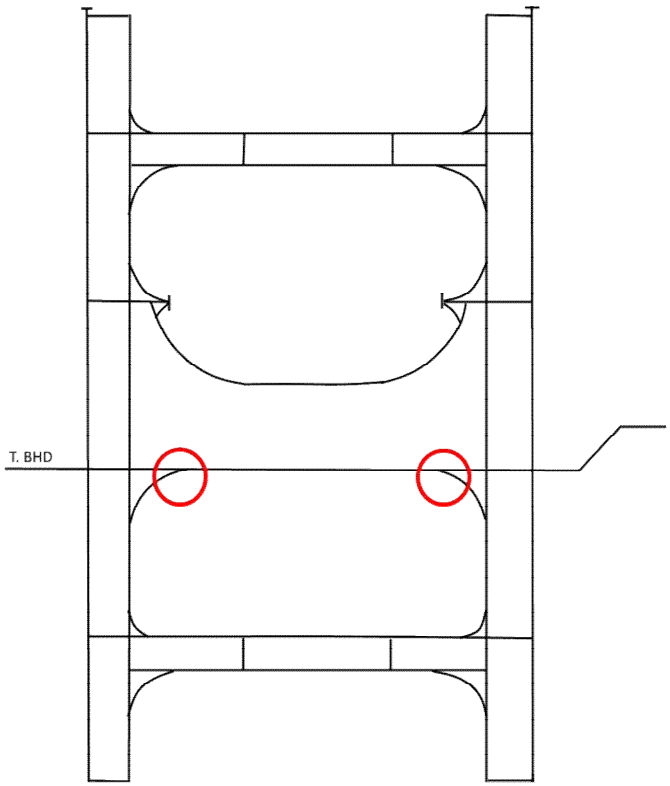


(2) Ore Carrier

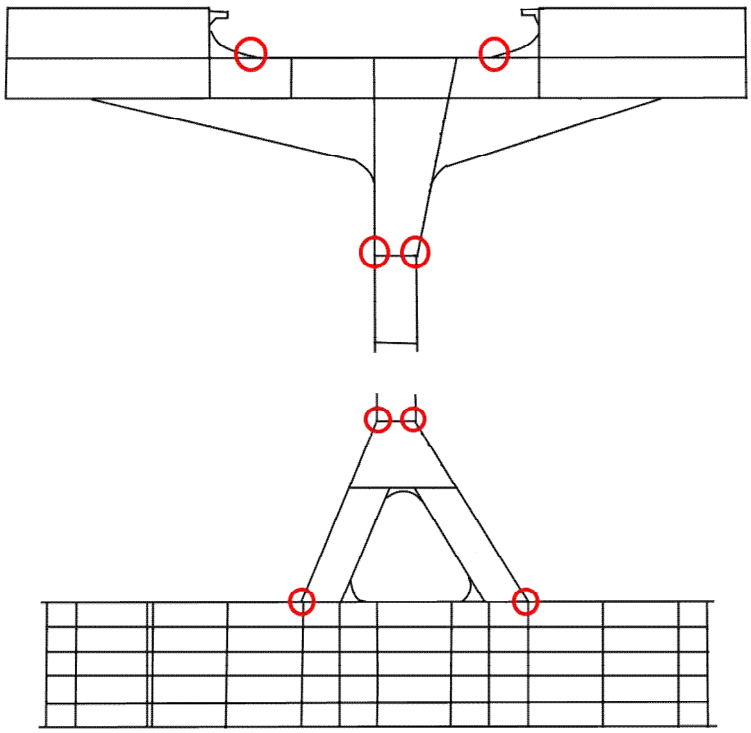
1. Critical Web Section



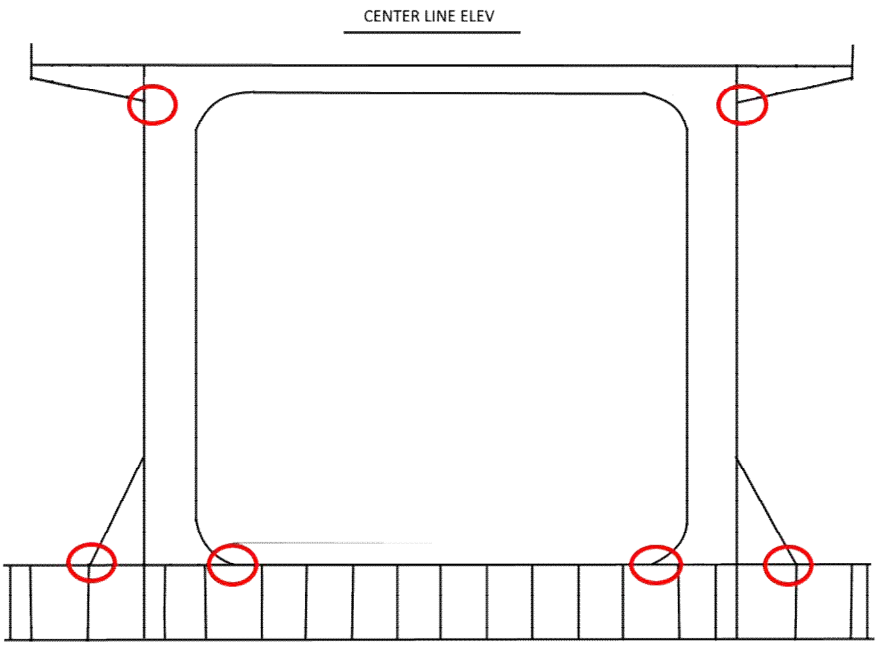
2. Stringer



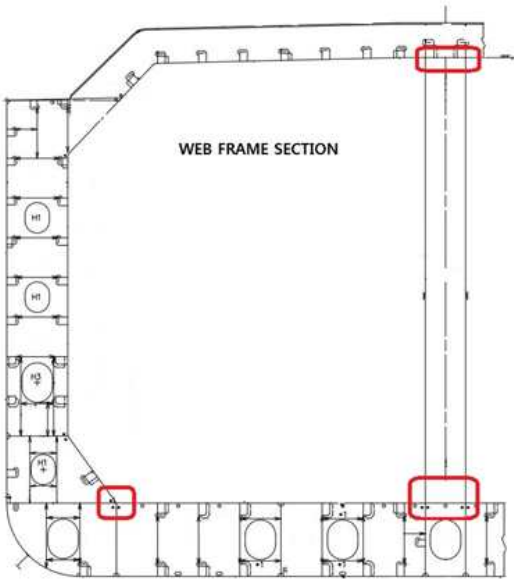
3. Hatch Coming, Upper Stool and Lower Stool



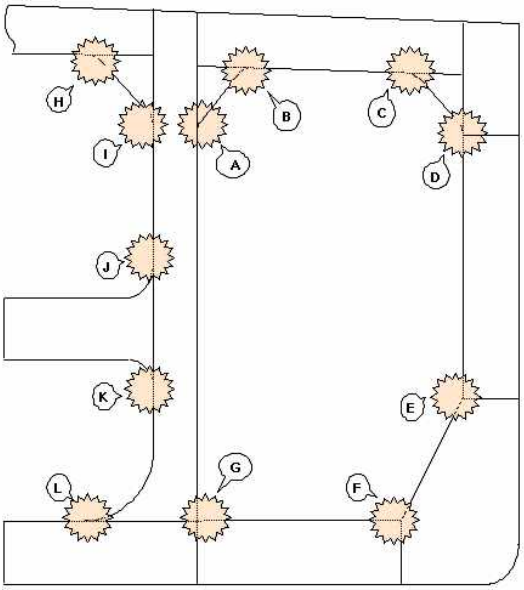
4. Typical Girder Elevation



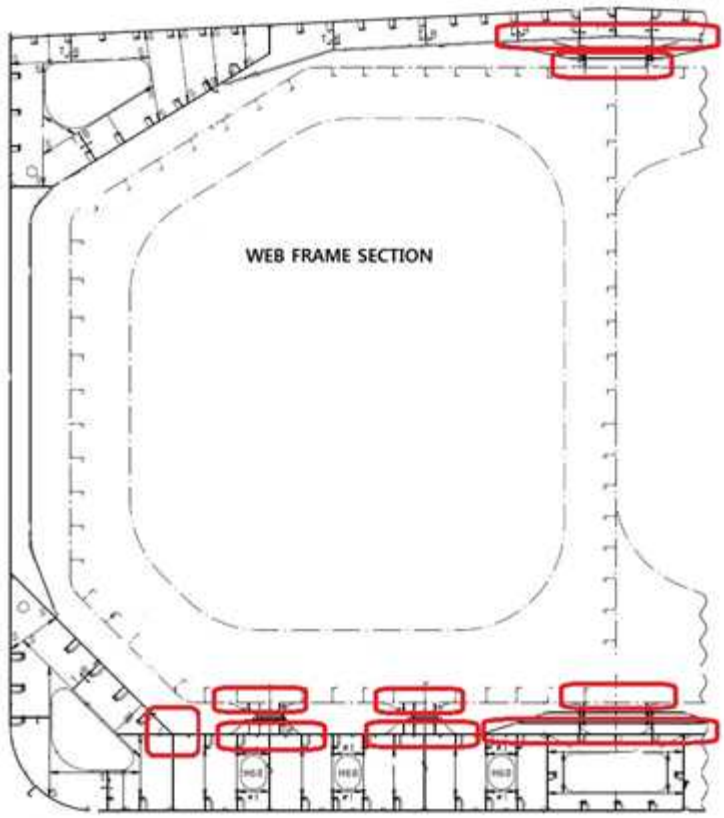
(3-1) Oil Tanker/Chemical Tanker




(3-2) Very Large Crude Oil Carrier(VLCC)

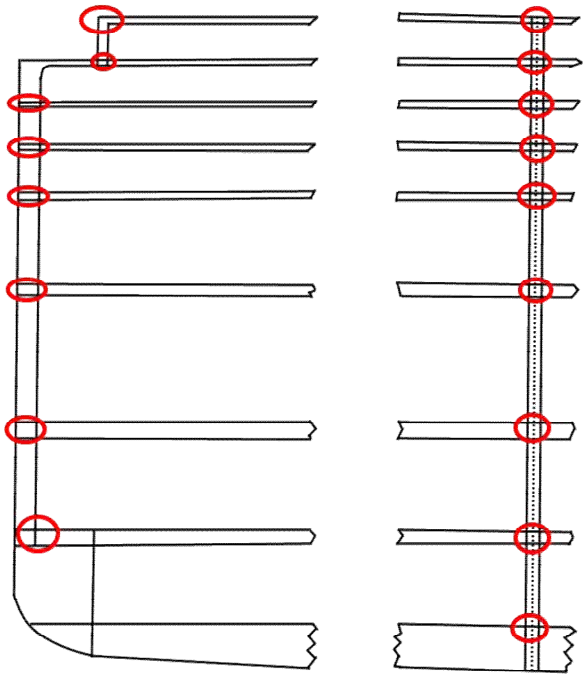



(4) Liquefied Gas Carrier

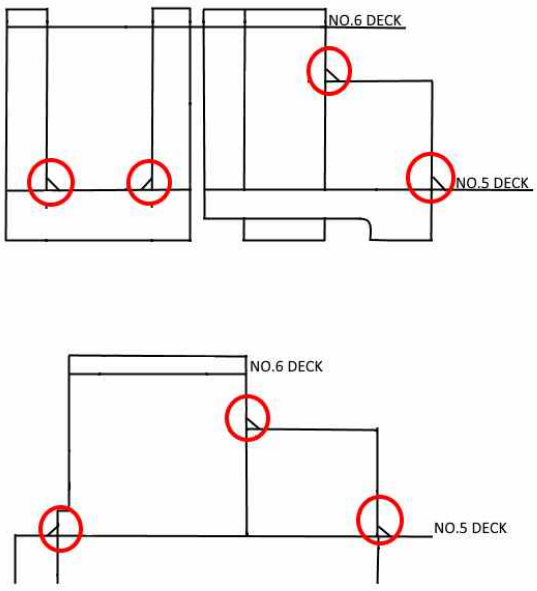


(5) Ro-Ro Ship

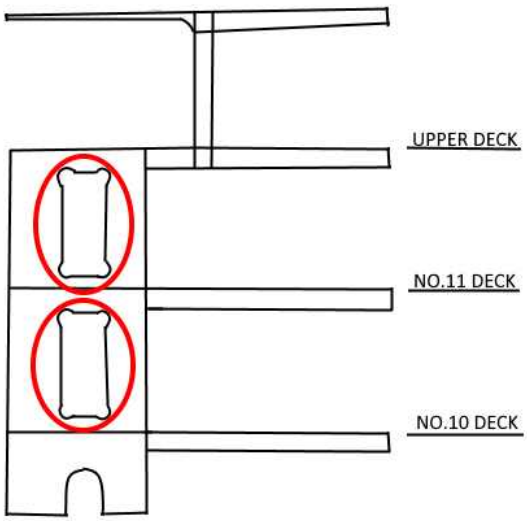
1. Typical Web Section



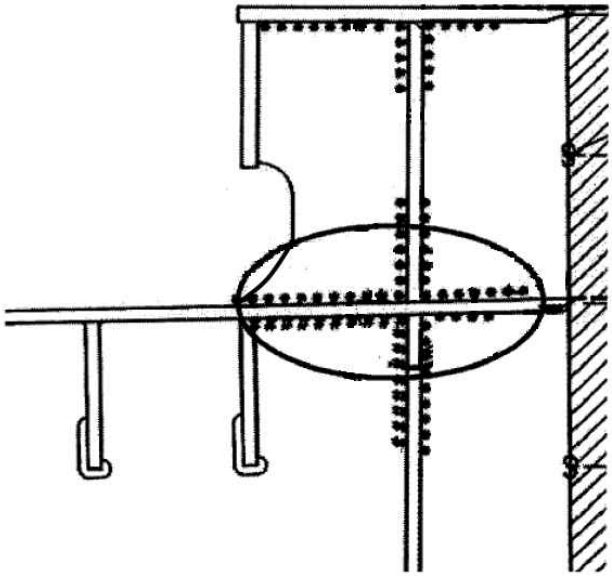
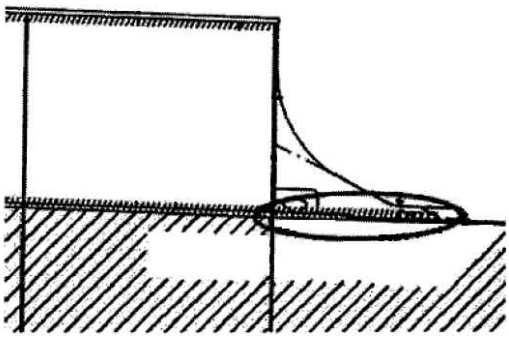
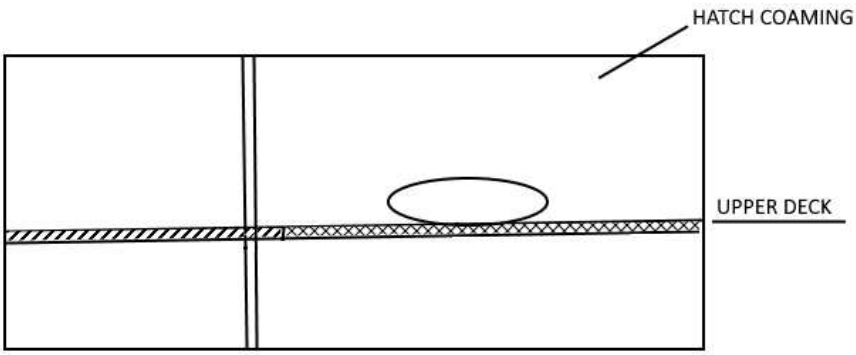
2. Side Girder Elevation

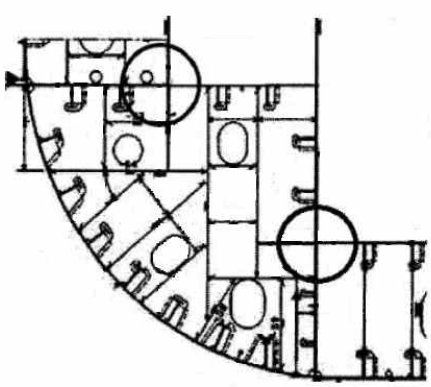
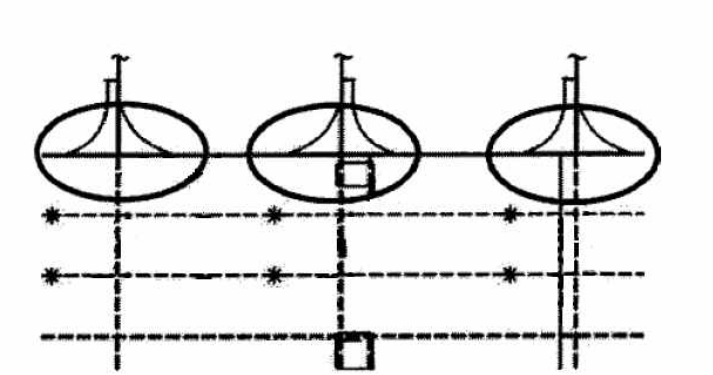
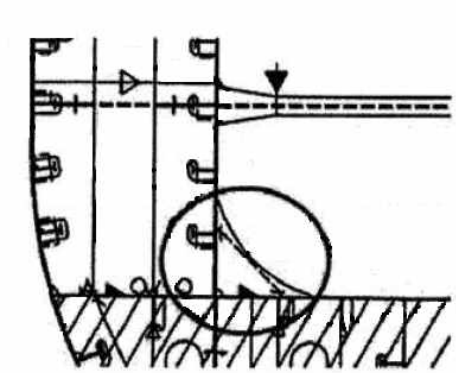
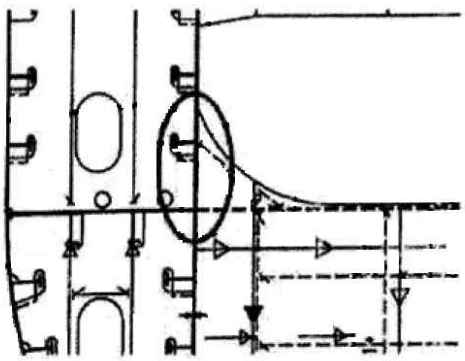


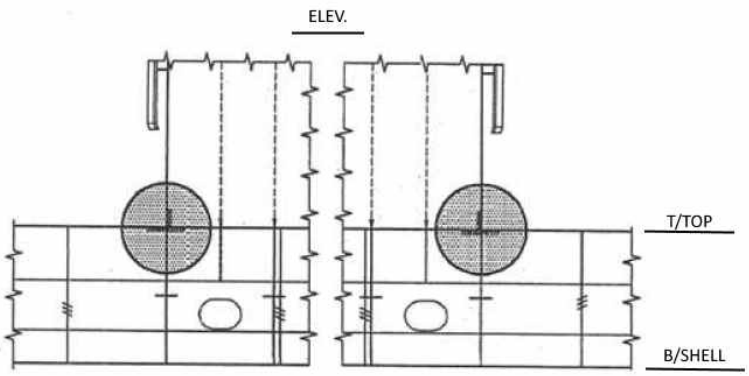
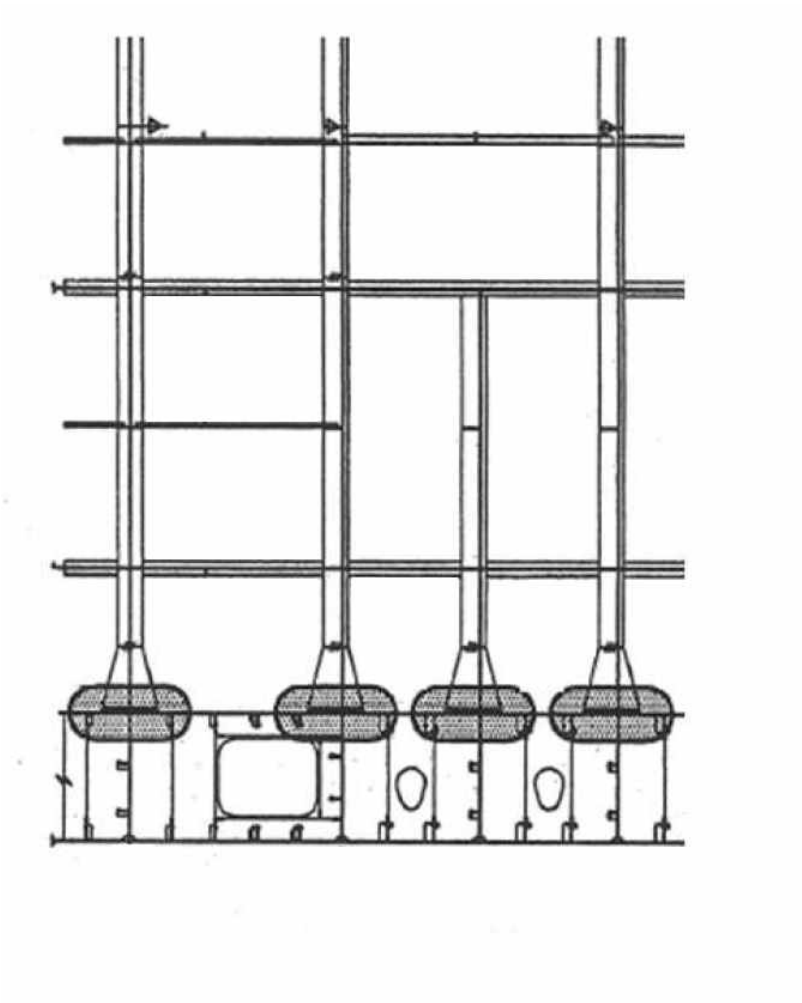

3. Web Section in Engine Room Area

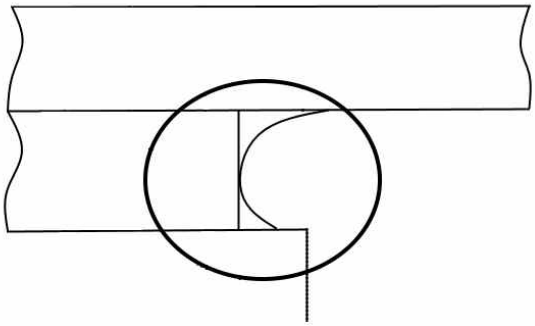
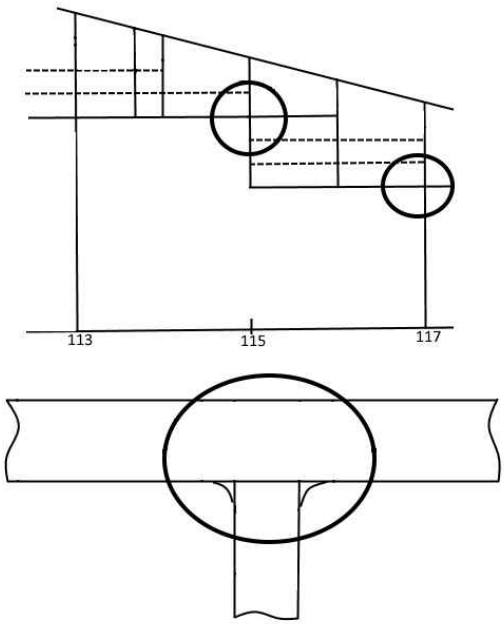
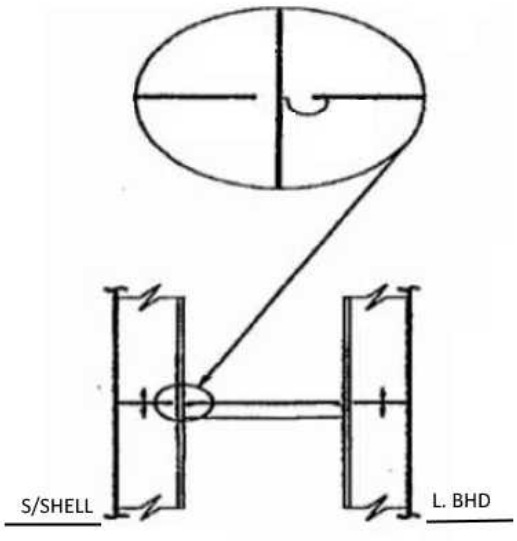


(6) Container Ship

| 1. Hatch Coaming | |
|---|---|
| Continuous both side welding area of extremely thick steel plates |  |
| Hatch Coaming Extension Bracket Area |  |
| Hatch Coaming Drain Hole |  |

| | |
|---|---|
| **2. Trans Web Section** | |
| Joint between Inner Bottom and Hopper or Joint between Longi. BHD and Bench Deck |  |
| Web Reinforcement Bracket Behind Bench Structure |  |
| **3. Bracket + Bulkhead** | |
| Bracket provided between Longi. BHD and Transverse BHD |  |
| Bracket provided between Longi. BHD and Transverse BHD |  |

| 4. Double Bottom Girder & Vertical Web (W. T. BHD) | |
|---|---|
| Double Bottom Girder + Vertical Web (W. T. BHD) |  |
| **5. W. T. BHD + Double Bottom Floor** | |
| Support Bulkhead |  |

| | |
|---|---|
| 6. Upper Deck + Hatch End Coaming (Cargo Hatch Corners) | |
| Cargo Hatch Corners |  |
| 7. Upper Deck + Cross Deck | |
| Upper Deck + Cross Deck |  |
| 8. Side shell Longitudinal + Transverse Web | |
| Side Shell Longitudinal + Transverse Web |  |

# Appendix 1-12-5 Recommendatory Sample - Cable Transit Seal System Register *(2021)*

| | |
|---|---|
| Name of Ship: | Sample |
| IMO No: | 12345 |
| Place: | Hamburg |
| Date: | XX/XX/2017 |

Inspected by: Smith

Transits 4

Total Openings 4

| TRANSIT | | | Inspected side | | BRAND | FRAME | | Type Approved | CONDITION(G - F - P) | INSPECTED | REPAIRED | MODIFIED | MAINTAINED | NOTES: | Checked by | DATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drawing number | ID | Location | | | | Type | Opening number | | | | | | | | | |
| | | | F | B | | | | | | | | | | | | |
| GIA-07-1047-000-883 | TT-MCT-011 | | | | C | d= 50 | x | | | | | | | NVD | PTO | 2015-02-26 |
| GIA-07-1047-000-883 | TT-MCT-012 | | | | C | 450x200 | x | | | | | | | NVD | PTO | 2015-02-26 |
| GIA-07-1047-000-883 | TT-MCT-013 | | | | C | 550x200 | x | | | | | | | NVD | PTO | 2015-02-26 |
| GIA-07-1047-000-883 | TT-MCT-014 | | | | C | 750x200 | x | | | | | | | Open, drilled hole not closed | PTO | 2015-02-26 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

C = Compound (not known brand)
R = Smith Blocks
B = MCT Williams
H = Heavy corrosion
N= Nelson, Terasaki
MB=Mixed brands
MM=Mixed module sizes
NVD=No Visible Defects
CPA=Checkpoints rectangular frames
CPB=Checkpoints round frames

# Annex 1-13 Owner's Hull Inspection and Maintenance Program

## 1. General

(1) The Owner's Hull Inspection and Maintenance Program is recommended as an assistant means for maintaining compliance with classification requirements between periodical surveys of the Society by means of owner's inspection and maintenance for the hull structure and corrosion prevention system on a regular basis. This program will not substitute the periodical survey to maintain the classification.

(2) This program can be applied to all type of ships at the request of the Owners. However, when an existing ship applies to enter the program, this program can be applied where deemed appropriate by the Society considering survey history, damage history and coating conditions, etc.

(3) The OHIMP notation shall be assigned as an additional special feature notation to ship comply with this Owner's Hull Inspection and Maintenance Program.

(4) The OHIMP notation and the application of this program may be cancelled by the Society if the program is not being satisfactorily carried out, should either the maintenance records or the general condition of the hull structure be determined to be unacceptable.

(5) In the case of a change of Owner, the application of this program is to be reconsidered.

(6) This program may be supported and maintained by a computerized system as deemed appropriate by the Society.

## 2. Requirements

(1) Outstanding Conditions of Class related to the hull, should be completed prior to the ship being able to participate in this program. (*2020*)

(2) Surveys to maintain the classification are to be up-to-date, and without outstanding Conditions of Class related to the hull structure and corrosion prevention system which would affect this program. (*2020*)

(3) In addition to the regular inspection and maintenance in accordance with the Owner's Hull Inspection and Maintenance Program, if there is a damage which may affect the classification at hull structure or corrosion prevention system, the occasional or additional inspections and maintenance are to be carried out and the damage is to be examined by the Society at the first port of call. If it necessary the voyage repairs are to be carried out in accordance with **Ch 2, 107. 5** of the Rules. The relevant details are to be recorded in the Owner's Hull Inspection and Maintenance Program as part of the report.

## 3. Approval and survey

(1) Documents and approval

The Owner is to submit a comprehensive Owner's Hull Inspection and Maintenance Program manual, which is to include the followings, to the Society. The Society will issue an approval certificate for the Owner's Hull Inspection and Maintenance Program after review the presented documents.

(A) Safety policy and enclosed space entry procedures of the company.(For information only)
(B) General Arrangement
(C) Midship Section

(D) Complete list of each spaces and areas,(i.e., cargo holds, cargo tanks, ballast tanks, void spaces, cofferdams, pipe tunnels, etc.) covered by the Owner's Hull Inspection and Maintenance Program.

(E) Details of any corrosion prevention system and coating condition for each of the space and area specified in (D) above

(F) Inspection intervals corresponding to each space and area, or group of space and areas

(G) Maintenance descriptions detailing the minimum work necessary for the satisfactory inspection of the each space and area

(H) Sample reports and reporting procedures to confirm that the Owner's Hull Inspection and Maintenance Program is working properly onboard. There is to be a system for reporting the following information to the Owners office and for recording onboard;

(a) Details of the inspections carried out(details are to include proper structure identification such as tank/hold information, frame number, deck, shell plating, stringers, bulkheads and longitudinals as identified on the ship's drawings)

(b) The conditions as found
(c) Any findings, repairs or maintenance undertaken

(I) Selection of designated inspector that conduct the inspection, including name, title and date of last related training

(J) Training information on inspector to carry out these inspection
(K) Other documentations as deemed necessary by the Society

(2) Implementation survey

(A) The implementation survey is to be carried out within one year from the date of the approval of the Owner's Hull Inspection and Maintenance Program to verify that the approval of Owner's Hull Inspection and Maintenance Program is valid onboard.

(B) During the implementation survey, the attending Surveyor is to check the following items.

(a) An approval certificate for the Owner's Hull Inspection and Maintenance Program
(b) Documents specified in (1)

(c) Whether the Master and designated inspectors are familiar with the Owner's Hull Inspection and Maintenance Program

(d) Check whether the Owner's Hull Inspection and Maintenance Program is operated satisfactorily.

(3) Annual audit

(A) An annual audit is to be carried out to check the operation of the Owner's Hull Inspection and Maintenance Program at Periodical Survey

(B) At the annual audit the attending Surveyor is to check the following items.

(a) An approval certificate for the Owner's Hull Inspection and Maintenance Program
(b) Reviewed Owner's Hull Inspection and Maintenance Program manual

(c) Whether the Master and designated inspectors are familiar with the Owner's Hull Inspection and Maintenance Program

(d) Ship's survey status and history

(e) The Owner's Hull Inspection and Maintenance Program information is being updated and the planned inspections are being carried and reported upon by a inspector responsible for maintaining the detail of the program as required

(f) General review of the Owner's Hull Inspection and Maintenance Program inspections accomplished within the previous year is to be carried out

(g) If the inspection report(s) indicate damages or other defects that affect or may affect classification, then the affected area is to be examined.

## 4. Inspector training

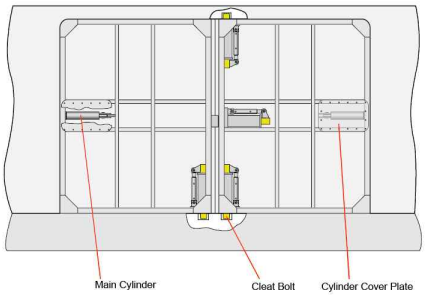
(1) The ship's designated inspector that will be carrying out the inspections for the Owner's Hull Inspection and Maintenance Program is to undergo training as deemed appropriate by the Society prior to being accepted as inspector for this program. However, if the navigation officer is designated as the inspector it may considered as if he had undergone the training already.

(2) The training can be done either internally or externally as decided by the Owner. As a minimum, the training program is to include topics such as means of access, coating evaluation, terminology of ship structure, classification survey, typical hull defects and/or critical structural areas associated with the ship type, acceptance and evaluation criteria, reporting, etc. ⚓

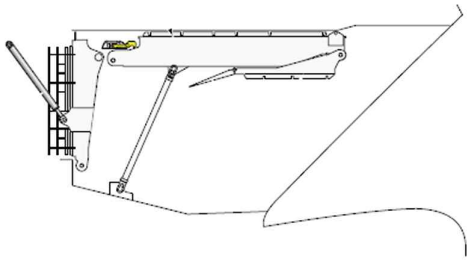
# Annex 1-14 Examples of Typical Bow, Inner, Side Shell and Stern Doors

Typical examples of bow, inner, side shell and stern doors specified in **Ch 2, Sec 16** of the Rules may be illustrated as follows.

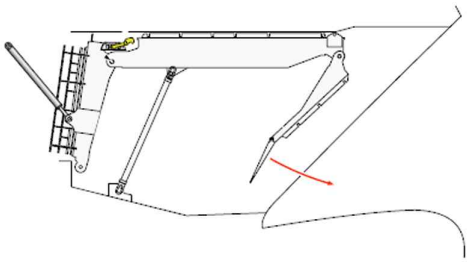
**1.** Inner Bow Doors - double leaf side hinged



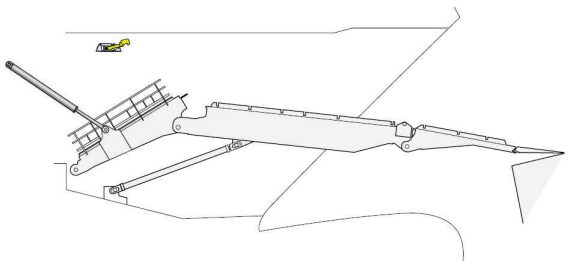

**2.** Bow Loading Ramp - stowed position, aft part (inner door) disconnected



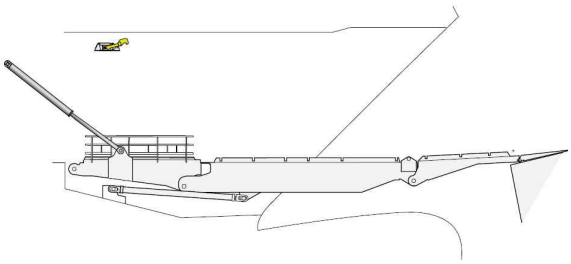
**3.** Bow Loading Ramp - beginning of opening sequence, aft part (inner door) connected by hydraulic hinge pin



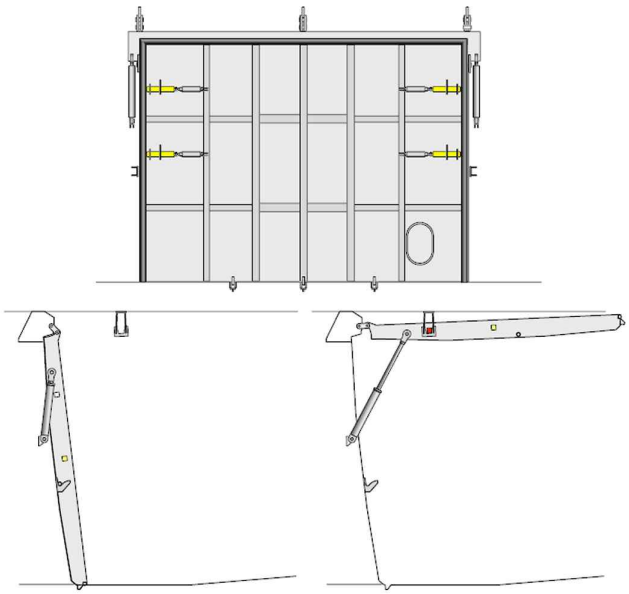
**4.** Bow Loading Ramp - ramp partly extended to quay



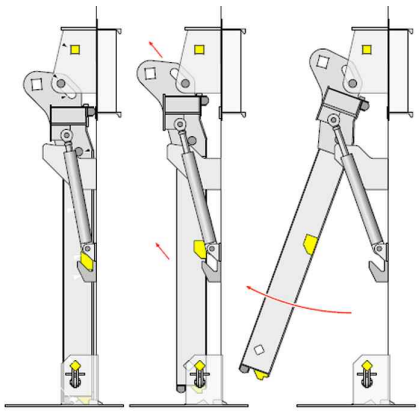
**5.** Bow Loading Ramp – ramp fully extended to quay



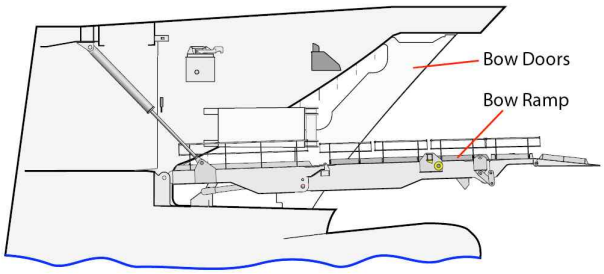
**6.** Inner Bow Door – single leaf top hinged, type 1



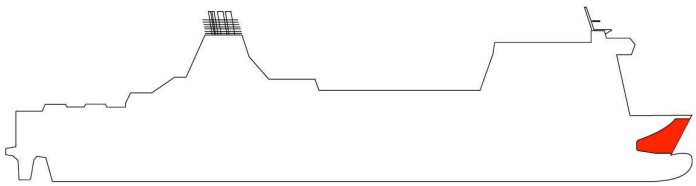
**7.** Inner Bow Door – single leaf top hinged, type 2



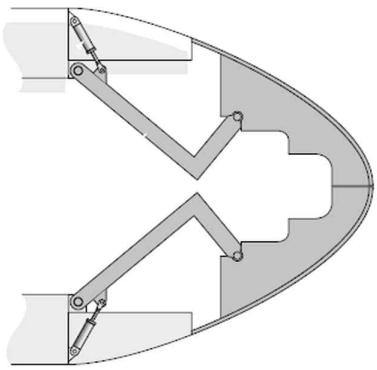
**8.** Bow Loading Ramp - side opening bow doors



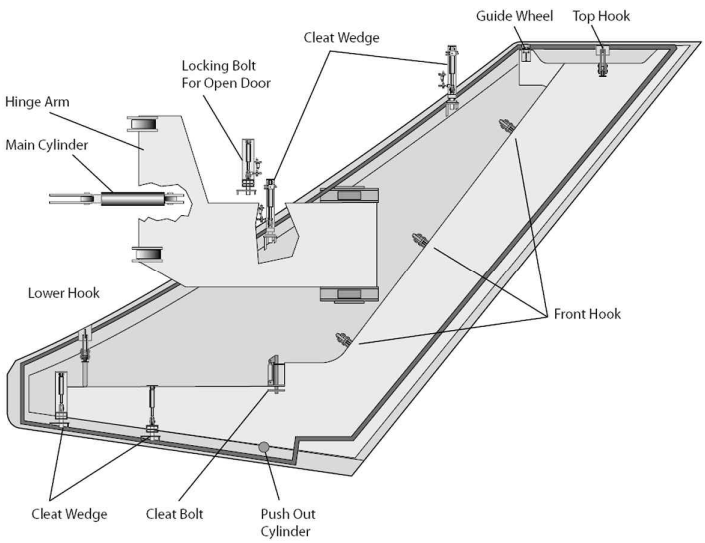

**9.** Bow side opening door - closed, side view



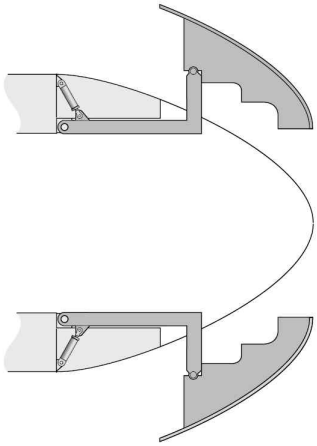
**10.** Bow side opening door - closed, top view



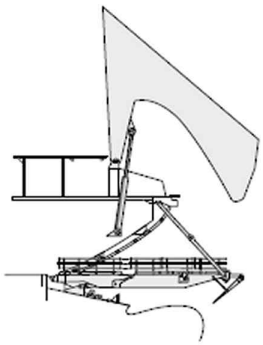
**11.** Bow side opening door - door panel details



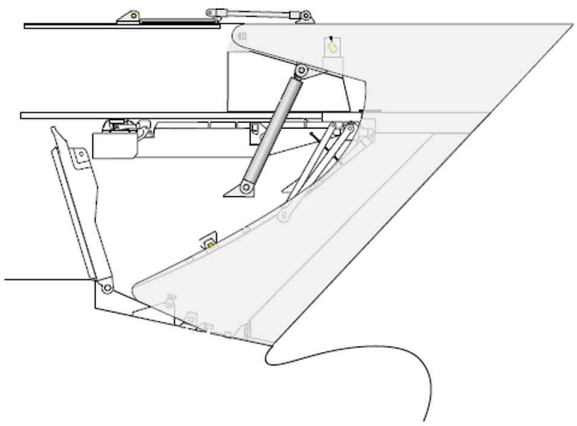
**12.** Bow side opening door - open, top view



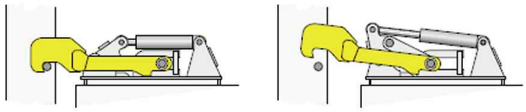
**13.** Bow Loading Ramp - visor type bow doors, general arrangement



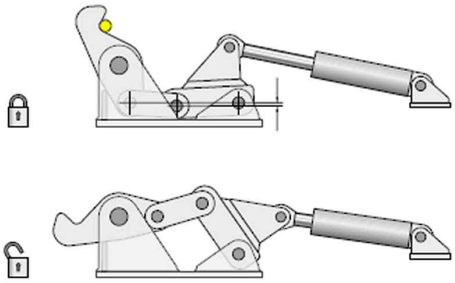
**14.** Bow Visor Door - general arrangement



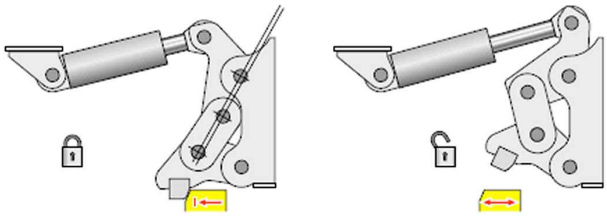
**15.** Cleating Hook 1



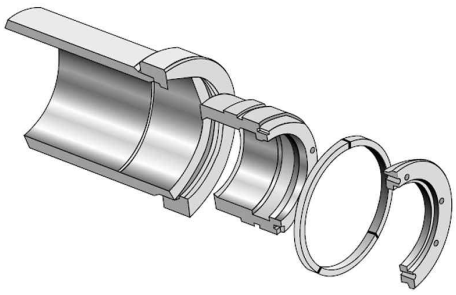
**16.** Cleating Hook 2



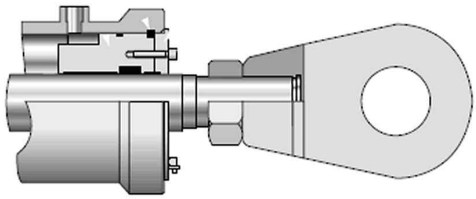
**17.** Cleating Wedge



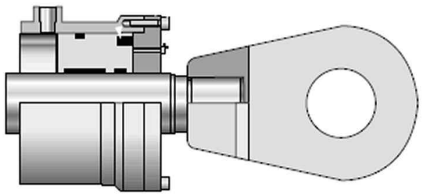
**18.** Hydraulic Actuators 1



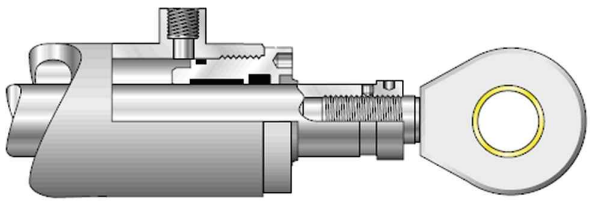
**19.** Hydraulic Actuators 2



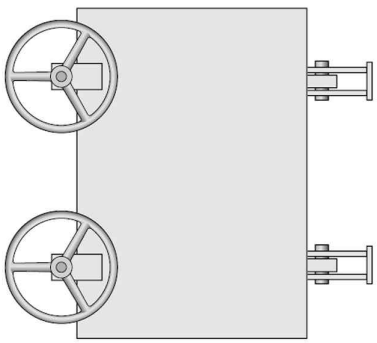
**20.** Hydraulic Actuators 3



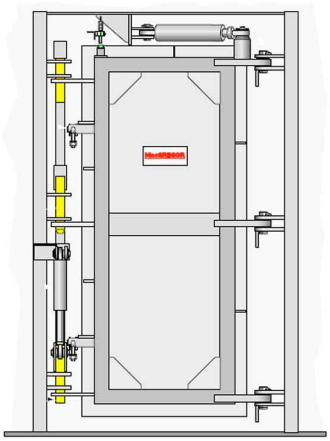
**21.** Hydraulic Actuators 4



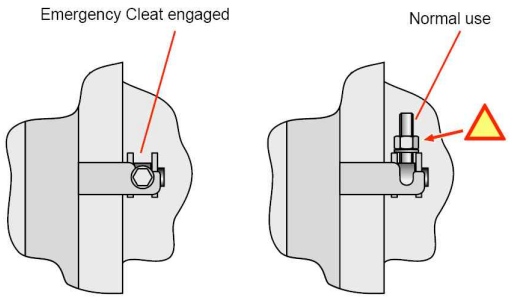
**22.** Control Panel - closing door



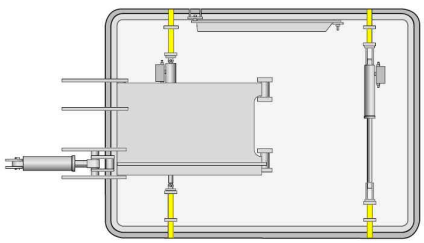
**23.** Bunker Door - closed, inside view



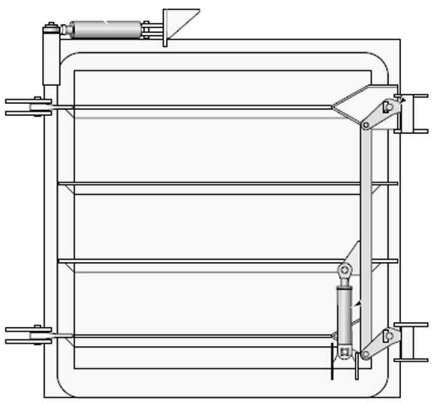
**24.** Bunker Door - Emergency Cleat



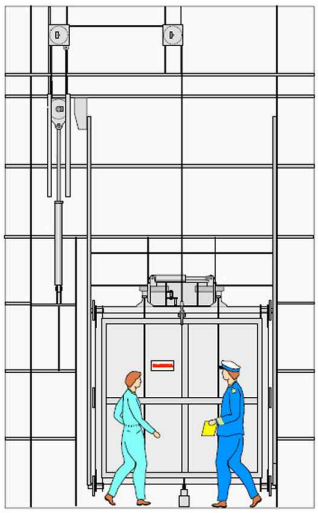

**25.** Bunker Port - type 1, closed, inside view



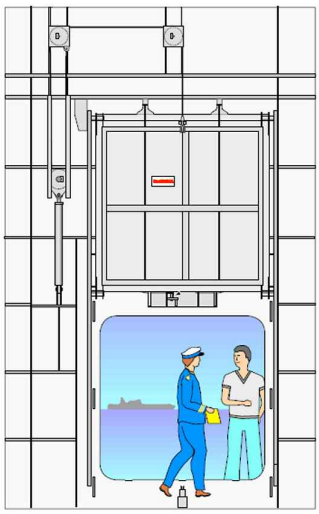
**26.** Bunker Port - type 2, closed, inside view



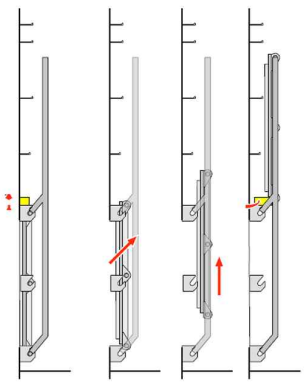
**27.** Cargo Door - closed, inside



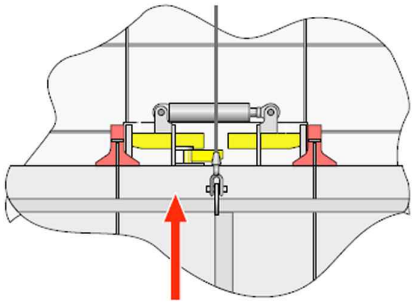
**28.** Cargo Door - open, inside



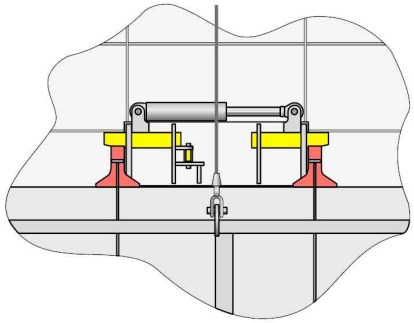
**29.** Cargo Door - principle function



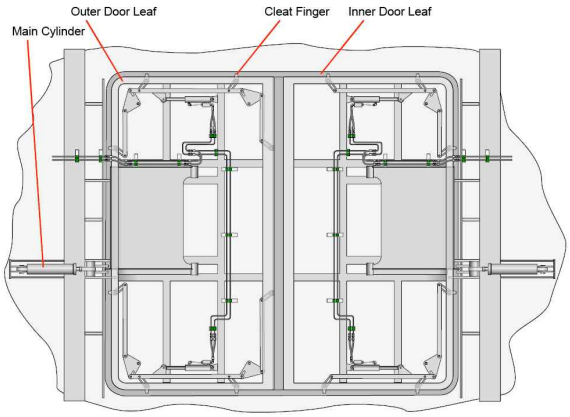
**30.** Cargo Door - top side hydraulic securing device disengaged



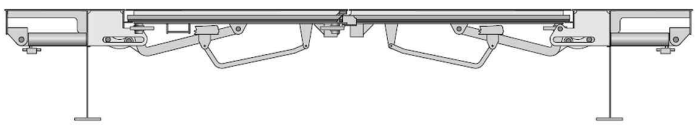
**31.** Cargo Door - top side hydraulic securing device engaged



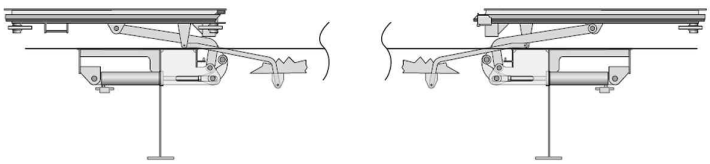
**32.** Side Shell Door - double leaf, closed, inside view



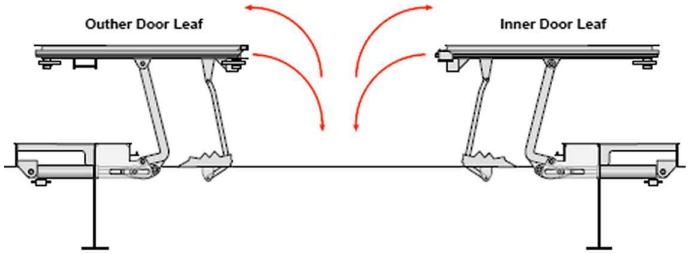

**33.** Side Shell Door - double leaf, closed, top view



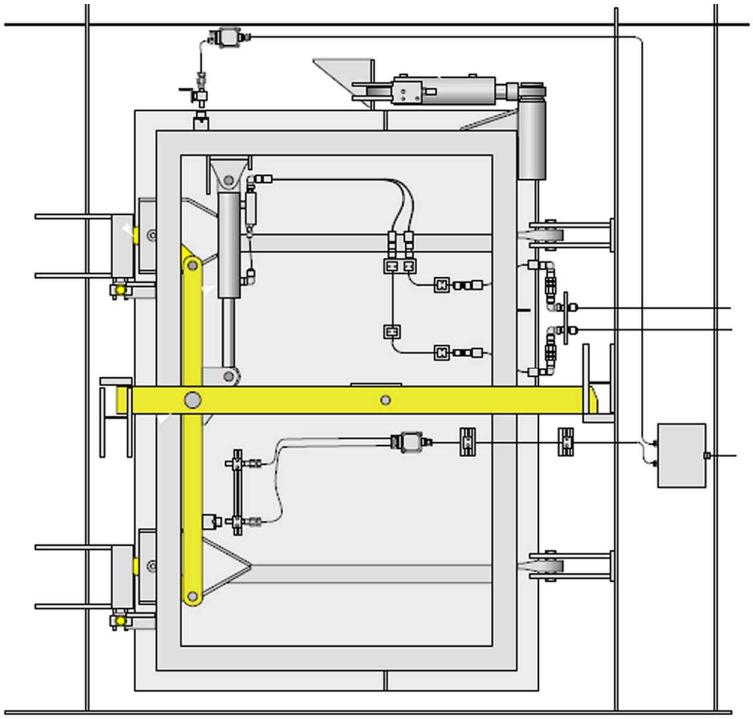
**34.** Side Shell Door - double leaf, fully opened, top view



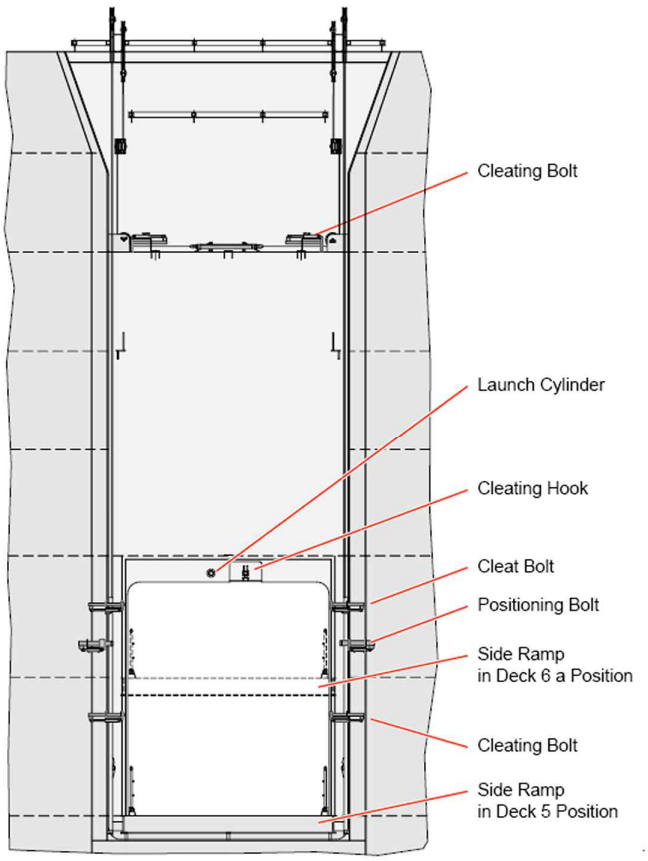
**35.** Side Shell Door - double leaf, half opened, top view



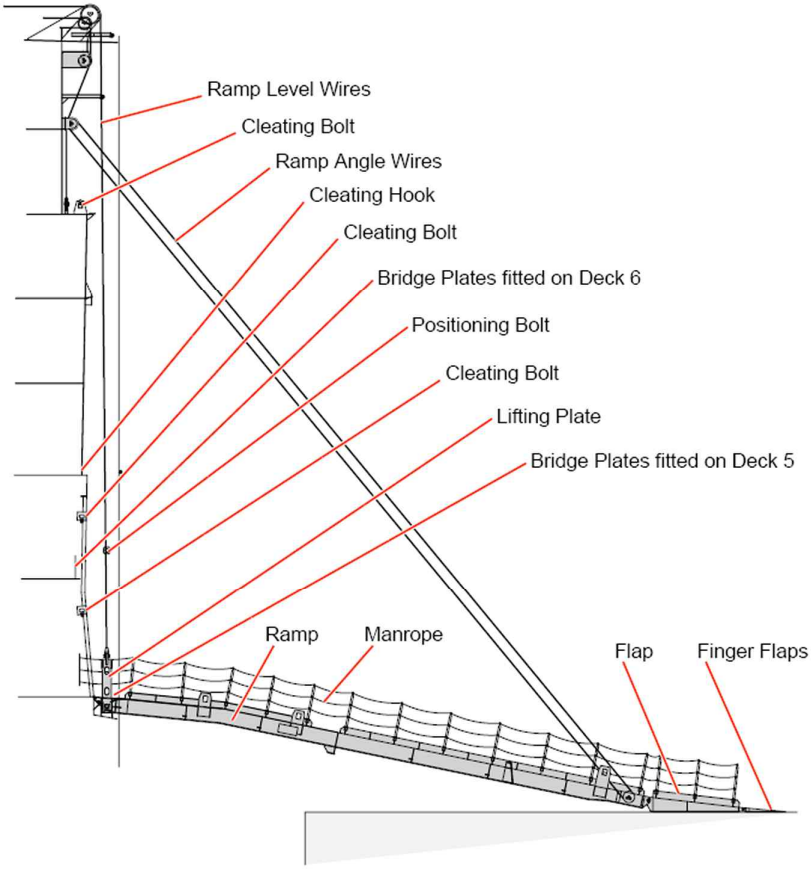

**36.** Pilot Door - inside view



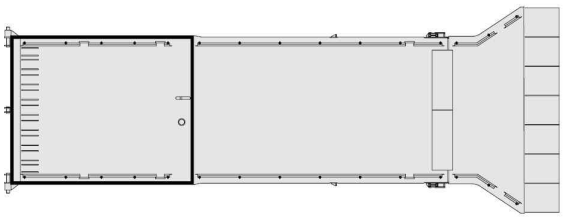
**37.** Side Ramp – front view



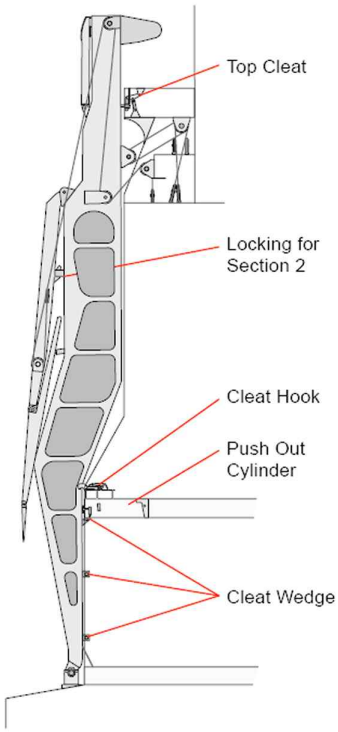
**38.** Side Ramp – side view



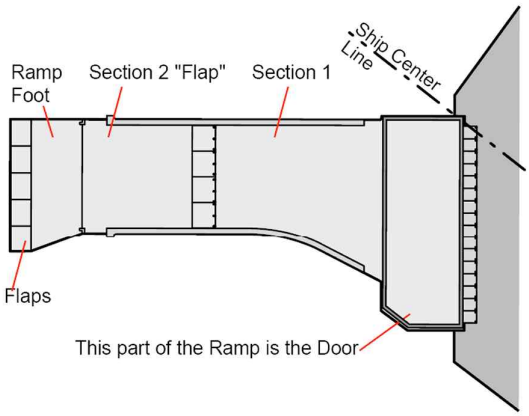

**39.** Side Ramp – top view



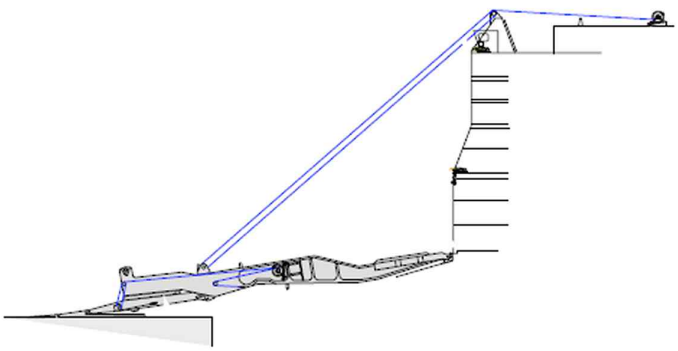
**40.** Stern Door - single leaf, closed, car carrier type



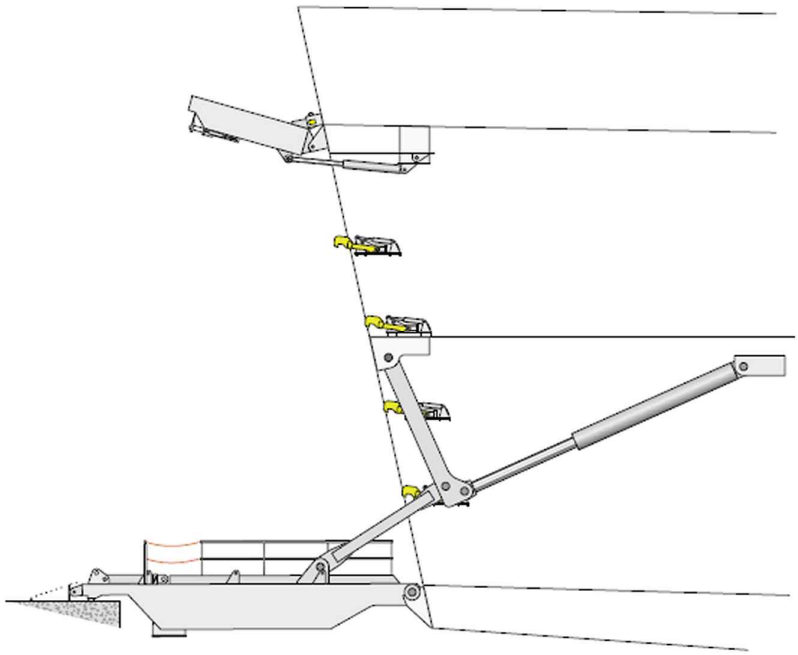

**41.** Stern Door - single leaf, open, car carrier type, top view



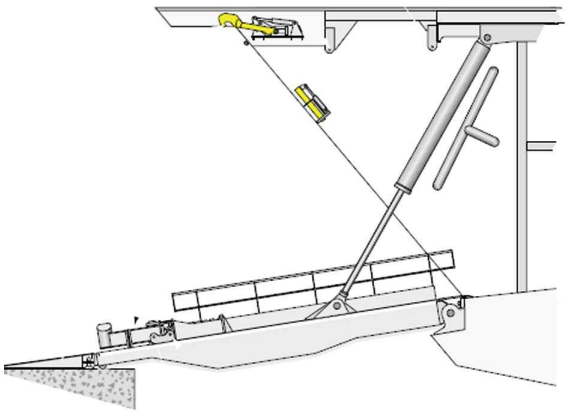

**42.** Stern Door - single leaf, open, car carrier type



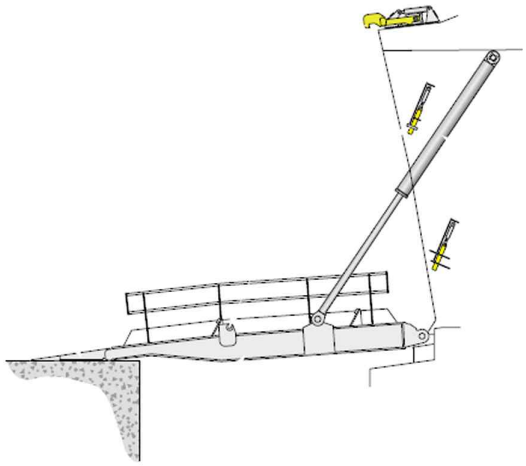
**43.** Stern Door – double leaf, open, typical cleating arrangement



**44.** Stern Door – single leaf, open typical cleating arrangement, type 1



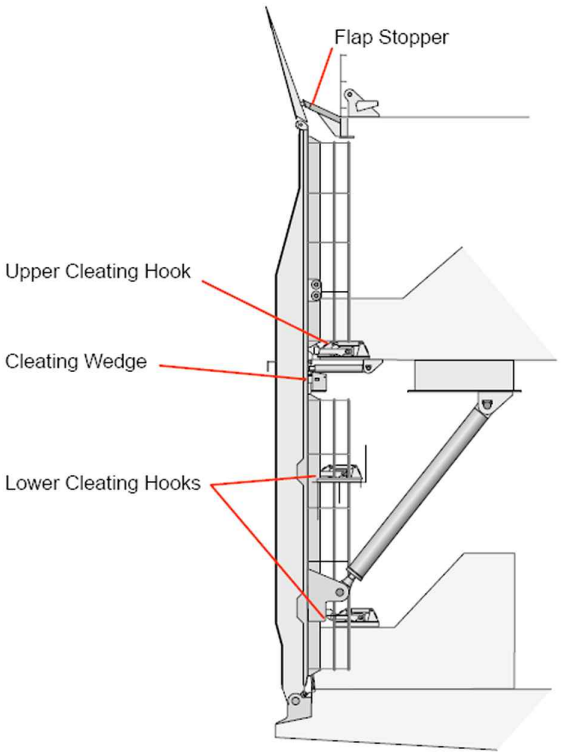
**45.** Stern Door – single leaf, open, typical cleating arrangement, type 2



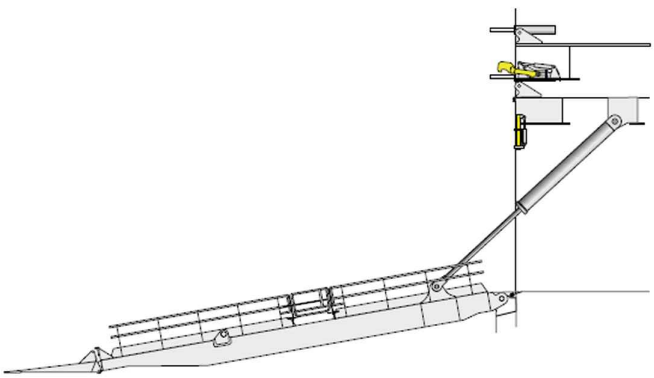
**46.** Stern Door - single leaf, closed, inside view, typical cleating arrangement, type 3



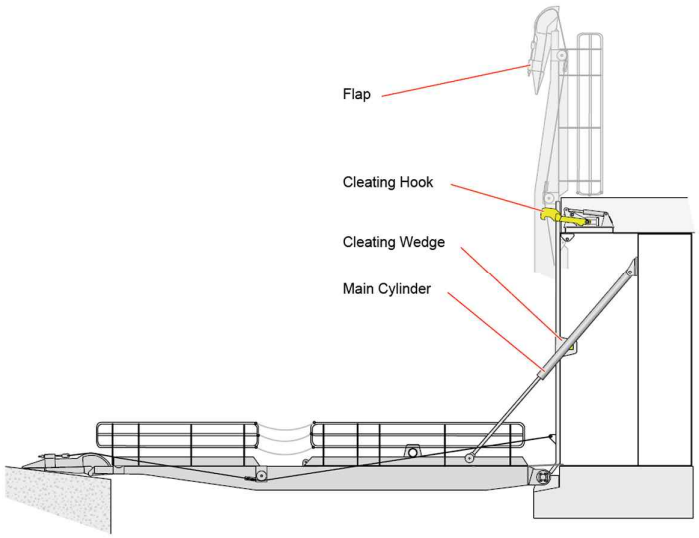

**47.** Stern Door - single leaf, closed, typical cleating arrangement, type 3




**48.** Stern Door - single leaf, open, push-out cylinder arrangement



**49.** Stern Door – single leaf, open, typical cleating arrangement, type 3



# Annex 1-15 Requirements for CLEAN Notation - 〈Void〉 *(2021)*

(Refer to the Guidance for Prevention System of Pollution from Ships)

# Annex 1-16 Procedures for Testing Tanks and Tight Boundaries *(2018)*

In the Classification Survey during construction, structural testing, leak testing and hose testing are to be carried out in accordance with the following:

## 1. General

(1) The testing procedures of watertight compartments are to be carried out in accordance with **ANNEX 1-16**, the "Procedures for Testing Tanks and Tight Boundaries". The requirements of **ANNEX 1-16** are divided into three parts, **PART A, Part B** and **PART C** as follows: *(2024)*

- PART A - SOLAS Ships (including CSR BC & OT)
- PART B - SOLAS Exempt/Equivalent Ships
- PART C - Non-SOLAS Ships

(2) Testing procedures of watertight compartments for SOLAS Ships (including CSR BC & OT) are to be carried out in accordance with PART A, unless:

(A) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of SOLAS Chapter II-1, Regulation 11, or for an equivalency agreeing that the content of PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and

(B) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

(3) Testing procedures of watertight compartments are to be carried out in accordance with PART B for SOLAS ships (including CSR BC & OT) for which: *(2024)*

(A) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of SOLAS Chapter II-1, Regulation 11, or for an equivalency agreeing that the content of PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and

(B) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

(4) Testing procedures of watertight compartments are to be carried out in accordance with **PART C** for non-SOLAS ships, see SOLAS Chapter I, Regulation 1 and Regulation 3. *(2024)*

# PART A - SOLAS Ships

## 1. GENERAL

(1) These test procedures are to confirm the watertightness of tanks, watertight boundaries and the structural adequacy of tanks which form part of the watertight subdivisions (watertight subdivision means the main transverse and longitudinal subdivisions of the ship required to satisfy the subdivision requirements of SOLAS Chapter II-1.) of ships. *(2024)*

These procedures may also be applied to verify the weathertightness of structures and shipboard outfitting. The tightness of all tanks and watertight boundaries of ships during new construction and those relevant to major conversions or major repairs(major repair means a repair affecting structural integrity) is to be confirmed by these test procedures prior to the delivery of the ship.

(2) Testing procedures of watertight compartments for SOLAS Ships (including CSR BC & OT) are to be carried out in accordance with PART A, unless:

(A) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of SOLAS Chapter II-1, Regulation 11, or for an equivalency agreeing that the content of PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and

(B) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

## 2. Application

(1) All gravity tanks(gravity tank means a tank that is subject to vapour pressure not greater than 70 kPa.) and other boundaries required to be watertight or weathertight are to be tested in accordance with this Procedure and proven to be tight and structurally adequate as follows:

(A) Gravity Tanks for their tightness and structural adequacy,
(B) Watertight Boundaries Other Than Tank Boundaries for their watertightness, and
(C) Weathertight Boundaries for their weathertightness.

(2) The testing of cargo containment systems of liquefied gas carriers is to be in accordance with the testing requirements in **420** to **426** of **Pt 7 Ch 5** of the Rules deemed appropriate by the Society.

(3) The testing of structures not listed in **Table 1** or **2** is to be specially considered.

## 3. Tests Types and Definitions

(1) Two types of tests

(A) Structural Test : A test to verify the structural adequacy of tank construction. This may be a hydrostatic test or, where the situation warrants, a hydropneumatic test.

(B) Leak Test : A test to verify the tightness of a boundary. Unless a specific test is indicated, this may be a hydrostatic/hydropneumatic test or an air test. A hose test may be considered an acceptable form of leak test for certain boundaries, as indicated by Footnote (3) of **Table 1**.

(2) The definition of each test type of test is as follows:

| | |
|---|---|
| Hydrostatic Test:<br>(Leak and Structural) | A test wherein a space is filled with a liquid to a specified head. |
| Hydropneumatic Test:<br>(Leak and Structural) | A test combining a hydrostatic test and an air test, wherein the a space is partially filled with a liquid and pressurized with air. |
| Hose Test:<br>(Leak) | A test to verify the tightness of a joint by a jet of water with the joint visible from the opposite side. |
| Air Tests:<br>(Leak) | A test to verify tightness by means of air pressure differential and leak indicating solution. It includes tank air test and joint air tests, such as compressed air fillet weld tests and vacuum box tests. |
| Compressed Air Fillet Weld Test:<br>(Leak) | An air test of fillet welded tee joints wherein leak indicating solution is applied on fillet welds. |
| Vacuum Box Test:<br>(Leak) | A box over a joint with leak indicating solution applied on the welds. A vacuum is created inside the box to detect any leaks. |
| Ultrasonic Test:<br>(Leak) | A test to verify the tightness of the sealing of closing devices such as hatch covers by means of ultrasonic detection techniques. |
| Penetration Test:<br>(Leak) | A test to verify that no visual dye penetrant indications of potential continuous leakages exist in the boundaries of a compartment by means of low surface tension liquids<br>(i.e. dye penetrant test). |

(3) The 'top of the overflow' is defined as being the top of any overflow system which is used to prevent overfilling of a tank. Such system can be an overflow pipe, airpipe, intermediate tank. For gravity tanks (i.e. sewage, grey water and similar tanks, not filled with pumps) the top of the overflow is to be taken as the highest point of the filling line.

Note: Gauging devices are not considered equivalent to an over flow system with the exception of fuel oil overflow tanks not intended to hold fuel which have been fitted with a level alarm.

Where a tank is fitted with multiple means of preventing overfilling, the decision on which overflow system is to be used to determine the test head is to be based on the highest point to which the liquid may rise in service. *(2024)*

## 4. Test Procedures

(1) General

(A) Tests are to be carried out in the presence of a Surveyor at a stage sufficiently close to the completion of work with all hatches, doors, windows, etc. installed and all penetrations including pipe connections fitted, and before any ceiling and cement work is applied over the joints. Specific test requirements are given in (4) and **Table 1**. For the timing of the application of coating and the provision of safe access to joints, see (5), (6) and **Table 3**.

(2) Structural test procedures

(A) Type and time of test

(a) Where a structural test is specified in **Table 1** or **Table 2**, a hydrostatic test in accordance with (4) (A) will be acceptable. Where practical limitations (strength of building berth, light density of liquid, etc.) prevent the performance of a hydrostatic test, a hydropneumatic test in accordance with (4) (B) may be accepted instead.

(b) hydrostatic test or hydropneumatic test for the confirmation of structural adequacy may be carried out while the vessel is afloat, provided the results of a leak test are confirmed to be satisfactory before the vessel is afloat.

(c) Alternative equivalent tank testing procedures may be considered for tanks which are constructed from composite materials such as glass reinforced plastic (GRP) and fibre reinforced plastic (FRP) based on the recommendations of the composite manufacturer. *(2024)*

(d) Where the cofferdam is waived in accordance with the following Rules, the structural test is carried out with a test pressure increased by 1 m. *(2025)*
- **Pt 3, Ch 15, Sec 3, 304** of the Rules
- **Pt 10, Ch 15, Sec 3, 304** of the Rules
- **Pt 13, Sub Pt 1, Ch 2, Sec 3, 1.2.4** of the Rules.
- **Pt 14, Ch 2, Sec 3, 1.2.4** of the Rules
- **Pt 15, Ch 2, Sec 3, 1.2.4** of the Rules

(B) Testing Schedule for New Construction or Major Structural Conversion

(a) Tanks which are intended to hold liquids, and which form part of the watertight sub-division of the ship, shall be tested for tightness and structural strength as indicated in **Table 1** or **Table 2.**

(b) The tank boundaries are to be tested from at least one side. The tanks for structural test are to be selected so that all representative structural members are tested for the expected tension and compression.

(c) The watertight boundaries of spaces other than tanks for structural testing may be exempted, provided that the water-tightness of boundaries of exempted spaces is verified by leak tests and inspections. Structural testing may not be exempted and the requirements for structural testing of tanks in (a) to (b) shall apply, for ballast holds, chain lockers and a representative cargo hold if intended for in-port ballasting.

(d) Tanks which do not form part of the watertight subdivision of the ship, may be exempted from structural testing provided that the water-tightness of boundaries of exempted spaces is verified by leak tests and inspections.

(3) Leak test procedures

(A) For the leak tests specified in **Table 1**, tank air tests, compressed air fillet weld tests, vacuum box test in accordance with (4) (D) through (4) (F), or their combination, will be acceptable. Hydrostatic or hydropneumatic tests may also be accepted as leak tests provided that (5), (6) and (7) are complied with. Hose tests will also be acceptable for such locations as specified in **Table 1**, note *3, in accordance with (4) (C).
The application of the leak test for each type of welded joint is specified in **Table 3**.

(B) Air tests of joints may be carried out in the block stage provided that all work on the block that may affect the tightness of a joint is completed before the test. See also (5) (A) for the application of final coatings and (6) for the safe access to joints and the summary in **Table 3**.

(4) Test Methods

(A) Hydrostatic test

(a) Unless another liquid is approved, hydrostatic tests are to consist of filling the space with fresh water or sea water, whichever is appropriate for testing to the level specified in **Table 1** or **Table 2**.

Also refer to 4. (7) "Hydrostatic or hydropneumatic tightness test.

(b) In cases where a tank is designed for cargo densities greater than sea water and testing is with fresh water or sea water, the testing pressure height is to simulate the actual loading for those greater cargo densities as far as practicable, but the test pressure shall not exceed the maximum design internal pressure at the top of tank. *(2024)*

(c) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.

(B) Hydropneumatic test

(a) Hydropneumatic tests, where approved, are to be such that the test condition, in conjunction with the approved liquid level and supplemental air pressure, will simulate the actual loading as far as practicable. The requirements and recommendations for tank air tests in (D) will also apply to hydropneumatic tests.

Also refer to 4. (7) "Hydrostatic or hydropneumatic tightness test.

(b) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.

(C) Hose test

(a) Hose tests are to be carried out with the pressure in the hose nozzle maintained at least at $2 \cdot 10^5$ Pa during the test. The nozzle is to have a minimum inside diameter of 12 mm and be at a perpendicular distance from the joint not exceeding 1.5 m. The water jet is to impinge directly upon the weld.

(b) Where a hose test is not practical because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported where necessary by means such as a dye penetrant test or ultrasonic leak test or the equivalent.

(D) Tank air test

(a) All boundary welds, erection joints and penetrations including pipe connections, are to be examined in accordance with approved procedure and under a stabilized pressure differential above atmospheric pressure not less than $0.15 \cdot 10^5$ Pa, with a leak indicating solution such as soapy water/detergent or a proprietary brand applied.

(b) A U-tube with a height sufficient to hold a head of water corresponding to the required test pressure is to be arranged. The cross sectional area of the U-tube is not to be less than that of the pipe supplying air to the tank. Arrangements involving the use of two calibrated pressure gauges to verify the required test pressure may be accepted taking into account the provisions in F5.1 and F7.4 of IACS Recommendation 140, “Recommendation for Safe Precautions during Survey and Testing of Pressurized Systems”.

(c) A double inspection is to be made of tested welds. The first is to be immediately upon applying the leak indication solution; the second is to be after approximately four or five minutes in order to detect those smaller leaks which may take time to appear.

(E) Compressed air fillet weld test

(a) In this air test, compressed air is injected from one end of a fillet welded joint and the pressure verified at the other end of the joint by a pressure gauge. Pressure gauges are to be arranged so that an air pressure of at least $0.15 \cdot 10^5$Pa can be verified at each end of all passages within the portion being tested.

Note : Where a leak test is required for fabrication involving partial penetration welds, a compressed air test is also to be applied in the same manner as to fillet weld where the root face is large, i.e., 6-8 mm.

(F) Vacuum box test

(a) A box(vacuum testing box) with air connections, gauges and an inspection window is placed over the joint with a leak indicating solution applied to the weld cap vicinity. The air within the box is removed by an ejector to create a vacuum of $0.20 \cdot 10^5$ ~ $0.26 \cdot 10^5$Pa inside the box.

(G) Ultrasonic test

(a) An ultrasonic echo transmitter is to be arranged inside of a compartment and a receiver is to be arranged on the outside. The watertight/weathertight boundaries of the compartment are scanned with the receiver in order to detect an ultrasonic leak indication. A location where sound is detectable by the receiver indicates a leakage in the sealing of the compartment.

(H) Penetration test

(a) A test of butt welds or other weld joints uses the application of a low surface tension

liquid at one side of a compartment boundary or structural arrangement. If no liquid is detected on the opposite sides of the boundaries after the expiration of a defined period of time, this indicates tightness of the boundaries. In certain cases, a developer solution may be painted or sprayed on the other side of the weld to aid leak detection.
(refer to **Fig 1**) *(2020)*

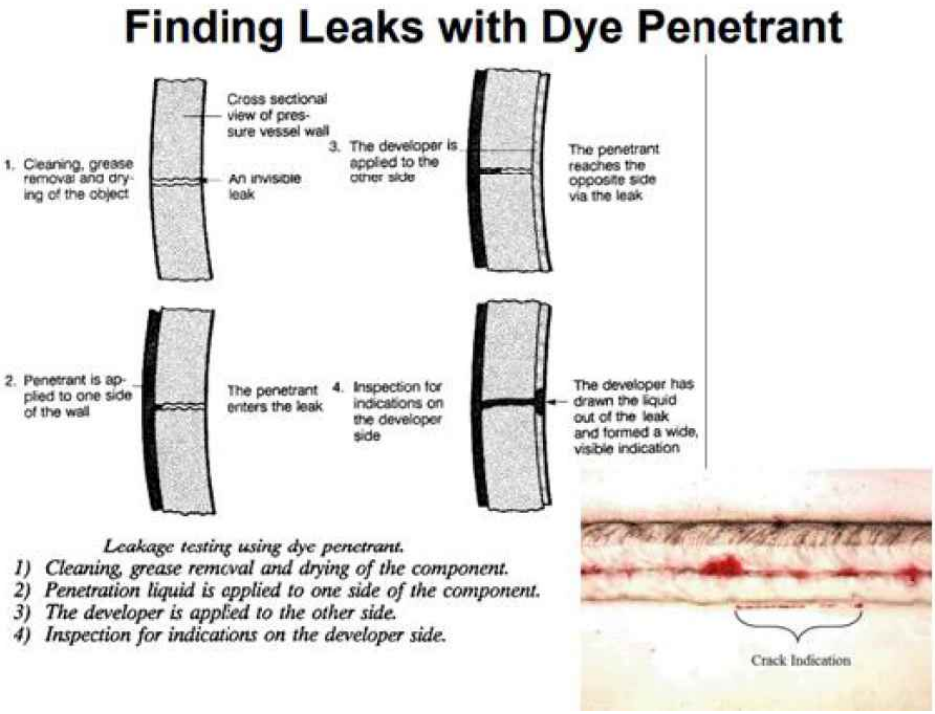



**Fig 1 Finding leaks with Penetration Test (from IACS Hull Panel)**

(l) Other test *(2020)*

(a) Other methods of testing may be considered by each Classification Society upon submission of full particulars prior to the commencement of testing.

(5) Application of Coating

(A) Final coating

(a) For butt joints welded by an automatic process, the final coating may be applied any time before the completion of a leak test of spaces bounded by the joints, provided that the welds have been carefully inspected visually to the satisfaction on the Surveyor.

(b) Surveyors reserve the right to require a leak test prior to the application of final coating over automatic erection butt welds.

(c) For all other joints, the final coating is to be applied after the completion of the leak test of the joint. See also **Table 3**.

(B) Temporary coating

(a) Any temporary coating which may conceal defects or leaks is to be applied at the time as specified for the final coating(see (A)). This requirement does not apply to shop primer.

(6) Safe access to joints
For leak tests, a safe access to all joints under examination is to be provided. See also **Table 3.**

(7) Hydrostatic or hydropneumatic tightness test
In cases where the hydrostatic or hydropneumatic tests are applied instead of a specific leak test, examined boundaries must be dew-free, otherwise small leaks are not visible.

**Table 1 Test Requirements for Tanks and Boundaries**

| | Tank or boundary to be tested | Test type | Test head or pressure | Remarks |
|---|---|---|---|---|
| 1 | Double bottom tanks[4] *(2024)* | Leak and Structural[1] | The greater of<br>- top of the overflow[10],<br>- to 2.4m above top of tank[2], or<br>- to bulkhead deck | - |
| 2 | Double bottom voids [5] | Leak | See **4** (4) (D) through 4 (4) (F), as applicable | including pump room double bottom and bunker tank protection double hull required by MARPOL Annex I |
| 3 | Double side tank *(2024)* | Leak and Structural[1] | The greater of<br>- top of the overflow[10],<br>- to 2.4m above top of tank[2], or<br>- to bulkhead deck | - |
| 4 | Double side voids | Leak | See **4** (4) (D) through 4 (4) (F), as applicable | - |
| 5 | Deep tanks other than those listed elsewhere in this table *(2024)* | Leak and Structural[1] | The greater of<br>- top of the overflow[10], or<br>- to 2.4m above top of tank[2] | - |
| 6 | Cargo oil tanks *(2024)* | Leak and Structural[1] | The greater of<br>- top of the overflow[10],<br>- to 2.4m above top of tank[2], or<br>- to top of tank[2] plus the design vapour pressure | - |
| 7 | Ballast hold of bulk carriers | Leak and Structural[1] | Top of cargo hatch coaming | - |
| 8 | Peak tanks *(2024)* | Leak and Structural[1] | The greater of<br>- top of the overflow[10], or<br>- to 2.4m above top of tank [2] | After peak to be tested after installation of stern tube |
| 9 | 1. Fore peak spaces with equipment | Leak | See **4** (4) (C) through **4** (4) (F), as applicable | - |
| | 2. Fore peak voids | Leak | See **4** (4) (D) through **4** (4) (F), as applicable | - |
| | 3. Aft peak spaces with equipment | Leak | See **4** (4) (C) through **4** (4) (F), as applicable | - |
| | 4. Aft peak voids | Leak | See **4** (4) (D) through **4** (4) (F), as applicable | After peak to be tested after installation of stern tube |
| 10 | Cofferdams | Leak | See **4** (4) (D) through **4** (4) (F), as applicable | - |
| 11 | 1. Watertight bulkheads | Leak [8] | See **4** (4) (C) through **4** (4) (F), as applicable [7] | - |
| | 2. Superstructure end bulkheads | Leak | See **4** (4) (C) through **4** (4) (F), as applicable | - |
| 12 | Watertight doors below freeboard or bulkhead deck | Leak [6],[7] | See **4** (4) (C) through **4** (4) (F), as applicable | - |
| 13 | Double plate rudder blades | Leak | See **4** (4) (D) through **4** (4) (F), as applicable | - |
| 14 | Shaft tunnels clear of deep tanks | Leak [3] | See **4** (4) (C) through **4** (4) (F), as applicable | - |

| | Tank or boundary to be tested | Test type | Test head or pressure | Remarks |
|---|---|---|---|---|
| 15 | Shell doors | Leak [3] | See **4** (4) (C) through **4** (4) (F), as applicable | – |
| 16 | Weathertight hatch covers and closing appliances | Leak [3],[7] | See **4** (4) (C) through **4** (4) (F), as applicable | Hatch covers closed by tarpaulins and battens excluded |
| 17 | Dual purpose tanks/dry cargo hatch covers | Leak [3],[7] | See **4** (4) (C) through **4** (4) (F), as applicable | In addition to structural test in item 6 or 7 |
| 18 | Chain lockers | Leak and Structural[1] | Top of chain pipe | – |
| 19 | L.O. sump. tanks and other similar tanks/spaces under main engines | Leak [9] | See **4** (4) (C) through **4** (4) (F), as applicable | – |
| 20 | Ballast ducts | Leak and Structural[1] | The greater of<br>– ballast pump maximum pressure, or<br>– setting of any pressure relief valve | – |
| 21 | Fuel oil tanks *(2024)* | Leak and Structural[1] | The greater of<br>– top of the overflow[10],<br>– to 2.4m above top of tank[2], or<br>– to top of tank[2] plus the design vapour pressure, or<br>– to bulkhead deck | – |
| 22 | Fuel oil overflow tanks not intended to hold fuel *(2024)* | Leak and Structural[1] | The greater of<br>– top of the overflow[10],<br>– to 2.4m above top of tank[2], or<br>– to bulkhead deck | – |

Note:

[1] "Refer to 4 (2) (B)"
[2] The top of a tank is the deck forming the top of the tank excluding any hatchways.
[3] Hose Test may also be considered as a medium of the test. See 3 (2).
[4] Including tanks arranged in accordance with the provisions of SOLAS regulation II-1/9.4.

[5] Including duct keels and dry compartments arranged in accordance with the provisions of SOLAS regulation II-1/11.2 and II-1/9.4 respectively, and/or oil fuel tank protection and pump room bottom protection arranged in accordance with the provisions of MARPOL Annex I, Chapter 3, Part A regulation 12A and Chapter 4, Part A, regulation 22 respectively.

[6] Where water tightness of a watertight door has not been confirmed by prototype test, testing by filling watertight spaces with water is to be carried out. See SOLAS regulation II-1/16.2 and MSC.1/Circ.1572 /Rev.1. *(2024)*

[7] As an alternative to the hose testing, other testing methods listed in 4 (4) (G) through 4 (4) (I) may be applicable subject to the adequacy of such testing methods being verified. See SOLAS regulation II-1/11.1. For watertight bulkheads (item 11.1) alternatives to the hose testing may only be used where a hose test is not practicable.

[8] A "Leak and structural test", see 4 (2) (B) is to be carried out for a representative cargo hold if intended for in-port ballasting. The filling level requirement for testing cargo holds intended for in-port ballasting is to be the maximum loading that will occur in-port as indicated in the loading manual.

[9] Where L.O. sump tanks and other similar spaces under main engines intended to hold liquid form part of the watertight subdivision of the ship, they are to be tested as per the requirements of Item 5, Deep tanks other than those listed elsewhere in this table.

[10] Refer to section 3. (3) *(2024)*

**Table 2 Additional Test Requirements for Special Service Ships/Tanks**

| | Type of ship/tank | Structures to be tested | Type of test | Test head or pressure | Remarks |
|---|---|---|---|---|---|
| 1 | Liquefied gas carriers | Integral tanks | Leak and structural | See Pt 7 Ch 5 420. to 426. | - |
| | | Hull structure supporting membrane or semi-membrane tanks | | | |
| | | Independent tanks type A | | | |
| | | Independent tanks type B | | | |
| | | Independent tanks type C | | | |
| 2 | Edible liquid tanks *(2024)* | Independent tanks | Leak and structural (1) | The greater of<br>- top of the overflow(3),<br>or<br>- to 0.9m above top of tank (2) | - |
| 3 | Chemical tankers *(2024)* | Integral or independent cargo tanks | Leak and structural (1) | The greater of<br>- to 2.4m above top of tank (2),<br>or<br>- to top of tank(2) plus the design vapour pressure | Where a cargo tank is designed for the carriage of cargoes with specific gravities larger than 1.0, see section 4. (4) (A) |

Note:

(1) Refer to 4 (2) (B)

(2) Top of tank is deck forming the top of the tank excluding any hatchways.

(3) Refer to section 3. (3) *(2024)*

**Table 3 Application of Leak Test, Coating and Provision of Safe Access for Type of Welded Joints**

| Type of welded joints | | Leak test | Coating[1] | | Safe access[2] | |
|---|---|---|---|---|---|---|
| | | | Before leak test | After leak test but before structural test | Leak test | Structural test |
| Butt | Automatic and FCAW[4] | Not required | Allowed[3] | N/A | Not required | Not required |
| | Manual or Semi-automatic (excluding FCAW) | Required | Not allowed | Allowed | Required | Not required |
| Fillet | Boundary including penetrations | Required | Not allowed | Allowed | Required | Not required |

Note:

[1] Coating refers to internal (tank/hold coating), where applied, and external (shell/deck) painting. It does not refer to shop primer.

[2] Temporary means of access for verification of the leak test.

[3] The condition applies provided that the welds have been carefully inspected visually to the satisfaction of the Surveyor.

[4] Flux Core Arc Welding (FCAW) semiautomatic butt welds need not be tested provided that careful visual inspections show continuous uniform weld profile shape, free from repairs, and the results of NDE testing show no significant defects.

# PART B - SOLAS Exempt/Equivalent Ships *(2024)*

## 1. GENERAL

(1) test procedures are to confirm the watertightness of tanks, watertight boundaries and the structural adequacy of tanks which form part of the watertight subdivisions (watertight subdivision means the main transverse and longitudinal subdivisions of the ship required to satisfy the subdivision requirements of SOLAS Chapter II-1.) of ships. These procedures may also be applied to verify the weathertightness of structures and shipboard outfitting. The tightness of all tanks and watertight boundaries of ships during new construction and those relevant to major conversions or major repairs (major repair means a repair affecting structural integrity) is to be confirmed by these test procedures prior to the delivery of the ship. *(2024)*

(2) Testing procedures of watertight compartments are to be carried out in accordance with PART B for those SOLAS ships (including CSR BC & OT) for which: *(2024)*

(A) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of SOLAS Chapter II-1, Regulation 11, or for an equivalency agreeing that the content of PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and

(B) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

## 2. APPLICATION

(1) Testing procedures are to be carried out in accordance with the requirements of **PART A** in association with the following alternative procedures for 4. (2) (B) of **PART A** "Testing Schedule for New Construction or Major Structural Conversion". *(2024)*

(2) The tank boundaries are to be tested from at least one side. The tanks for structural test are to be selected so that all representative structural members are tested for the expected tension and compression.

(3) Structural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations with only minor localized differences determined to be acceptable by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test.

The acceptance of leak testing using an air test instead of a structural test does not apply to cargo space boundaries adjacent to other compartments in tankers and combination carriers or to the boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships.

(4) Additional tanks may require structural testing if found necessary after the structural testing of the first tank.

(5) For tanks which are less than 2 $m^3$ in volume, structural testing may be replaced by leak testing. *(2024)*

(6) Where the structural adequacy of the tanks and spaces of a vessel were verified by the structural testing required by either **PART A** or **PART B 2.** (3), subsequent vessels in the series (i.e. sister ships built from the same plans at the same shipyard) may be exempted from structural testing of tanks, provided that: *(2024)*

(A) water-tightness of boundaries of all tanks and spaces are verified by leak tests and thorough inspections are carried out.

(B) structural testing is carried out for at least one tank or space of "each type" among all tanks/spaces of each sister vessel.

Note : The expression of "each type" refers to the purpose of the tanks given in each row of **Table 1** where the structural testing is required.

(C) additional tanks and spaces may require structural testing if found necessary after the structural testing of the first tank or if deemed necessary by the attending Surveyor.

For cargo space boundaries adjacent to other compartments in tankers and combination carriers or boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships, struc-

tural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations with only minor localised differences determined to be acceptable by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test.

(7) Sister ships built (i.e. keel laid) two years or more after the delivery of the last ship of the series, may be tested in accordance with PART B 2. (6) at the discretion of the Society, provided that: *(2024)*

(A) general workmanship has been maintained (i.e. there has been no discontinuity of shipbuilding or significant changes in the construction methodology or technology at the yard, shipyard personnel are appropriately qualified and demonstrate an adequate level of workmanship as determined by the Society); and

(B) an NDT plan is implemented and evaluated by the Society for the tanks not subject to structural tests. Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting.

The work is to be carried out in accordance with the Rules and under survey of the Society.

# PART C - Non-SOLAS Ships *(2024)*

## 1. GENERAL

(1) These test procedures are to confirm the watertightness of tanks, watertight boundaries and the structural adequacy of tanks which form part of the watertight subdivisions (watertight subdivision means the main transverse and longitudinal subdivisions of the ship) of ships. These procedures may also be applied to verify the weathertightness of structures and shipboard outfitting. The tightness of all tanks and watertight boundaries of ships during new construction and those relevant to major conversions or major repairs (major repair means a repair affecting structural integrity) is to be confirmed by these test procedures prior to the delivery of the ship.

(2) Testing procedures of watertight compartments are to be carried out in accordance with **PART C** for non-SOLAS ships, see SOLAS Chapter I, Regulation 1 and Regulation 3.

## 2. APPLICATION

(1) Testing procedures are to be carried out in accordance with the requirements of **PART A** in association with the following alternative procedures for **4.** (2) (B) of **PART A** "Testing Schedule for New Construction or Major Structural Conversion".

(2) The tank boundaries are to be tested from at least one side. The tanks for structural test are to be selected so that all representative structural members are tested for the expected tension and compression.

(3) The requirements given in **Table 1** of **PART A** to structurally test tanks to 2.4 m above the top of the tank do not apply. Instead, the minimum test pressure for structural testing is to be taken as 0.3D + 0.76 m above the top of the tank where the top of the tank is the deck forming the top of the tank, excluding any hatchways and D is the depth of the ship. The minimum test pressure need not be taken greater than 2.4 m above the top of the tank.

(4) Structural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations with only minor localised differences determined to be acceptable by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test.

The acceptance of leak testing using an air test instead of a structural test does not apply to cargo space boundaries adjacent to other compartments in tankers and combination carriers or to the boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships.

(5) Additional tanks may require structural testing if found necessary after the structural testing of the first tank.

(6) For tanks which are less than 2 $m^3$ in volume, structural testing may be replaced by leak testing.

(7) Where the structural adequacy of the tanks and spaces of a vessel were verified by the structural testing required by either **PART A** or **PART C 2.** (4), subsequent vessels in the series (i.e. sister ships built from the same plans at the same shipyard) may be exempted from structural testing of tanks, provided that:

(A) water-tightness of boundaries of all tanks and spaces are verified by leak tests and thorough inspections are carried out.

(B) structural testing is carried out for at least one tank or space among all tanks/spaces of each sister vessel.

(C) additional tanks and spaces may require structural testing if found necessary after the structural testing of the first tank or if deemed necessary by the attending Surveyor.

For cargo space boundaries adjacent to other compartments in tankers and combination carriers or boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships, structural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations with only minor localised differences determined to be acceptable by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test.

(8) Sister ships built (i.e. keel laid) two years or more after the delivery of the last ship of the series, may be tested in accordance with **PART C 2.** (7) at the discretion of the Society, provided that:

(A) general workmanship has been maintained (i.e. there has been no discontinuity of shipbuilding or significant changes in the construction methodology or technology at the yard, shipyard personnel are appropriately qualified and demonstrate an adequate level of workmanship as determined by the Society); and

(B) an NDT plan is implemented and evaluated by the Society for the tanks not subject to structural tests. Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. The work is to be carried out in accordance with the Rules and under survey of the Society. ⚓

# Annex 1-17 Laid-up and recommissioning of ships *(2018)*

## Section 1 General

### 101. General

**1.** This Annex provides requirements for ships to maintain classification during lay up and to be re-commissioned after laid-up required in **Ch 2, 106.** of the Rules.

**2.** Types of laid-up divided in cold laid-up and hot laid-up in accordance with **Sec 5**.

**3.** Requirements of this Annex applies normally to ships laid-up over 12 months(e.g. cold lay up). For ships laid-up less than 12 months(e.g. hot laid-up), requirements in this Annex are to be appropriately applied in consideration of laid-up condition of the ship.

**4.** This Annex covers minimum requirements for classification and insurance companies or the local authorities may requires to meet additional requirements.

## Section 2 Surveys

### 201. Laid-up survey

**1.** At the beginning of the laid-up period, a laid-up survey is to be carried out as the followings;

(1) General condition of hull above the waterline
(2) Laid-up condition and anchoring arrangement.
In particular, the Condition of Class which is affected her laid-up directly is to be surveyed with special attention. (*2020*)

(3) Main engine operating condition for emergency
(4) Lightings and her whistle equipment for prevention of collision.
(5) Sanitary and accommodation condition
(6) Fire fighting and life saving equipment.
(7) Drainage arrangements.
(8) Radio apparatus for communication to ashore.
(9) Closing appliance conditions of sea chest in engine room and double bottom manhole cover.

### 202. Re-commissioning survey

**1.** Owners are to make the necessary arrangements to remove the temporary laid-up installations provided for preservation measures and the protective materials and coatings (oil, grease, inhibitors, desiccants), before the survey is commenced. It is the Owners' responsibility to verify that the ship parts that are not covered by class are reactivated in satisfactory operational condition.

**2.** The scope of the re-commissioning survey is to include:

(1) a general examination of the hull, deck fittings, safety systems, machinery installations
(2) all overdue surveys at the date of re-commissioning survey. (where two or more kinds of periodical survey are overdue, only the heavier survey is to be carried out) *(2022)*

(3) dealing with the Conditions of Class overdue at the date of re-commissioning survey. *(2022)*

**3.** For the hull the following is to be carried out:

(1) examination of shell plating above the waterline, deck plating, hatch covers and coamings
(2) examination of load line items
(3) overall survey of all cargo tanks/holds
(4) overall survey of representative ballast tanks when the laid-up period does not exceed two years
(5) overall survey of all ballast tanks when the laid-up period is two years and over
(6) function tests of bilge and ballast systems.

**4.** For the deck fittings the following is to be carried out:

(1) examination of the fire main under working pressure
(2) where possible, examination of deck piping under working pressure
(3) function tests of class items
(4) checking inert gas installation under working condition after inspection of water seal and function test of deck non-return valve and pressure/vacuum valves.

**5.** For machinery installations the following is to be checked:

(1) lubricating oil of main engines, auxiliary engines, reduction gears, main thrust bearings and stern tube
(2) the general condition of crankcase, crankshaft, piston rods and connecting rods of diesel engines
(3) the deflection of crank webs of diesel engines.
(4) the condition of blades of turbines through the inspection doors
(5) the condition of the water side of condensers and heat exchangers
(6) the condition of expansion arrangements
(7) the condition of reduction gears through the inspection doors
(8) the condition after overhauling of pressure relief devices
(9) the test of bilge level alarms, when fitted.

**6.** The main and emergency electrical installations are to be tested. The parallel shedding of main generators and main switchboard safety devices are to be checked. A megger test of the electrical installation is to be performed.

**7.** For the fire prevention, detection and fire-fighting systems, the following is to be examined or tested:

(1) remote control for quick closing of fuel oil valves, stopping of fuel oil pumps and ventilation systems, closing of fire doors and watertight doors
(2) fire detectors and alarms
(3) fire-fighting equipment.

**8.** The automated installation is to be checked for proper operation.

**9.** When classed, the installations for refrigerated cargo are to be examined under working conditions. Where the laid-up period exceeds two years, representative components of the installation are to be dismantled.

**10.** For other specific classed installations, the Owners are to submit a survey program to the Society.

**11.** On completion of the above surveys, following tests are to be performed.

(1) For passenger ships, sea-trial is to be carried out and survey details are to be applied for the separate requirements as specified by the Society. *(2024)*
(2) In addition to function tests for each machinery installations, engine trial and when deemed unnecessary, sea trial under attendance of the Surveyor, to be performed.

## 203. Issue of Laid-up attestation

**1.** Where issue of Laid-up attestation is requested by the Owner in accordance with of **Ch 2, 106. 5** of Rules, Laid-up attestation may be issued provided that the laid up condition is in satisfactory after laid-up survey. At the laid-up survey, it is to verify that the safety conditions, preservation measures, laid-up site and mooring arrangements are in accordance with the program approved by the Society in accordance with of **Sec 3**.

**2.** An annual laid-up condition survey is to be performed in lieu of the normal annual class surveys to ascertain that the laid-up condition is maintained continuously by the laid-up maintenance program in accordance with of **Sec 3**. At the annual laid-up condition survey, it is to be checked that the arrangements made for the laid-up are unchanged and that the maintenance work and tests are carried out in accordance with the maintenance manual and recorded in the lay-up log-book.

# Section 3 Laid-up Maintenance Program

## 301. General

This Section provides detail contents for the laid-up maintenance program required in **Ch 2, 106. 2** of the Rules.

## 302. Safety conditions

**1.** Safety conditions to be kept throughout the laid-up period are as the followings

(1) Power supply
Adequate power supply is to be supplied, or readily available either from movable generator on board the ship or from shore.

(2) Manning
Watch personnel are to be provided. The number of the watch personnel will depend on the size of the ship, the lay-up site and mooring arrangements, the shore assistance available in case of fire, leakage or flooding, the maintenance required to provide adequate preservation.

(3) Safety

(A) The fire alarm system shall be tested before laid-up. The alarm shall be arranged so that the watch keeping crew member may hear the alarm at the work place during lay up periods.

(B) The emergency fire pump shall be tested before laid-up and also tested once a week during laid-up periods.

(C) Other safety systems and equipment is to be prepared which is deemed necessary for crews' safety during laid-up period.

## 303. Preservation measures for laid-up and maintenance

**1.** A laid-up log-book is to be kept on board, in which the maintenance work and tests carried out during the laid-up period are to be entered with the corresponding dates. The nature and frequency of the maintenance, inspections and tests are also to be defined in the lay-up log book.

**2.** The following measures for preservation and maintenance during the laid-up period are to be taken by Owners according to the type of ship, hull equipment, machinery installations and the specific cases of laid-up conditions.

(1) Exposed parts of the hull

(A) Underwater parts of the hull are to be protected against corrosion.
(B) All accesses leading to internal spaces are to be kept closed.
(C) All vent pipes and ventilation trunks are to be kept closed.

(2) Internal spaces

(A) Cargo tanks and cargo holds are to be emptied, cleaned and kept dry.
(B) Ballast tanks are to be kept either full or empty. When ballast spaces are kept filled with sea water, special care is to be taken to keep such spaces topped up and protected against corrosion.

(C) Chain lockers are to be drained, cleaned and kept dry. Coating with bituminous paint is recommended.

(D) Fuel oil and lubricating oil tanks are to be drained regularly.
(E) Empty fuel and lubricating oil tanks are to be cleaned and kept dry.
(F) Fresh water or distilled water tanks are to be kept full or empty. Empty tanks are to be cleaned and kept dry.

(G) The bilge and tank top in engine rooms are to be cleaned and kept dry.
(H) Ship side sea suction and overboard discharge valves not in use are to be kept closed.

(3) Deck fittings

(A) The windlass, capstans and winches are to be regularly greased and turned once a week.
(B) Cargo piping on deck is to be drained, blown through if deemed necessary and kept dry by opening up drains.

(C) Electrical machinery and navigational equipment are to be regularly checked for preservation condition.

(4) Machinery

(A) Machinery spaces
(a) The air temperature inside the machinery spaces is normally to be kept above 0°C.
(b) Humidity is to be kept as low as possible and within acceptable limits.

(B) Machinery - General
(a) Exposed mechanical parts of machinery are to be greased.

(b) All rotating machinery such as diesel engines, reciprocating engines, pumps, turbines, electric motors and generators are to be turned at regular intervals with a limited number of revolutions (the lubricating oil system should be put in operation or proper priming applied). Units are not to be stopped in the same position as the previous one.

(C) Main turbines
(a) Turbines are to be kept dry.
(b) Expansion arrangements are to be suitably greased.

(D) Auxiliary turbine-driven machinery
(a) Stators are to be drained and kept dry.
(b) Shaft sealing glands are to be lubricated.
(c) Exhaust steam pipes are to be kept dry.

(E) Condensers and heat exchangers
(a) Condensers and heat exchangers are to be drained and kept dry.

(F) Auxiliary machinery
(a) Air receivers are to be drained, opened up and cleaned. Pressure relief valves are to be cleaned and slightly lubricated.

(b) Air compressor crankcases are to be drained, cleaned and refilled with clean oil. Cylinders and valves are to be lubricated. Coolers are to be drained and dried. Air drains are to be opened and the system dried.

(c) Air start lines are to be drained and dried.
(d) All steam, feed, condensate systems are to be drained and dried.

(e) Rotating machine is to be greased or supplied of lubricating oil for rotating parts and shall be turned at least once a month.

(G) Piping
Pipes not in use are to be drained and kept dry.

(H) Diesel engines
(a) Sea water cooling pipes are to be drained.
(b) Starting valves are to be lubricated (internally and externally).
(c) Motor oil is to be sprayed in cylinders and on all external parts liable to corrosion.

(d) Turbo charger ball bearings are to be oil sprayed and rotated for an integer number of revolutions plus one quarter of a revolution.

(e) Scavenge spaces are to be cleaned
(f) Engines are to be turned weekly.

(I) Shaft lines
(a) Shaft lines are to be coated with grease.
(b) Shaft bearing cooling pipes are to be drained.

(c) For sea water lubricated propeller shafts, the packing gland of the engine room stuffing box is to be tightened.

(d) For oil lubricated stern tubes, ingress of sea water in the oil is to be check regularly. The oil level in the tank is to be verified regularly.

(e) Propeller shaft lines are to be rotated an integer number of revolutions plus one quarter of a revolution.

(f) Bearing boxes are to be emptied, cleaned and refilled with new oil.

(5) Electrical installations

(A) Switchboards, sub-feeder panels, fuse panels and starters are to be made tight. Desiccant is to be provided.

(B) Electrical insulation of each item is to be kept at a minimum 200 kΩ and general insulation is to be not less than 50 kΩ Local electric heating may be necessary to improve the level of insulation, particularly in the generators/alternators and large motors.

(C) A megger test is to be performed regularly.

(6) Steering gear

(A) It is recommended that the steering gear should be operated monthly.

(7) Boilers

(A) Safety device for boiler shall be kept in good condition in case of using boiler during laid-up periods.

(B) Resting boiler is to be kept with dry method, wet method, inert gas method, etc.

(C) It is desirable that dry method using dehumidifier is taken in case ship is laid up for a long time. Also dehumidifier shall be exchanged or dried periodically.

(D) In case wet method is taken, distilled water mixed with anti-corrosions shall fill boiler including superheater and economizer. When icing is possible, wet method shall not be taken.

(8) Automated installation

(A) Recommendations for electronic components are the same as those given for electrical installations.

(B) For pneumatic parts the manufacturers' recommendations are to be followed and the system is to be checked regularly.

(C) Pressure, temperature or level sensors are generally not affected by damage when not used. However, when available, the manufacturers' recommendations are to be followed.

## Section 4 Laid-up site and mooring arrangements

### 401. General

The choice and suitability of the laid-up site, as well as the type of mooring conditions, the mooring arrangements and their efficiency during the laid-up period remain the responsibility of the Owner. However, at the Owner's request, the mooring arrangement may be reviewed by the Society.

### 402. Recommendations for the laid-up site

1. The following recommendations are to be considered by Owners regarding the choice and suitability of the laid-up site.

(1) sheltered from open sea, strong currents and waves
(2) not exposed to whirling winds or turbulent tidal waves
(3) not exposed to moving ice
(4) clear of corrosive waste waters
(5) provided with adequate ship/shore communications.

### 403. Recommendations for the mooring arrangements

1. The following recommendations are to be considered by Owners with respect to the mooring arrangements:

(1) ground holding should be adequate

(2) vessels laid-up to buoys or anchored should be moored in such a way as to be prevented from swinging with normal wind and tidal changes

(3) chain cables should not be subject to cross-contact or twisting and stern anchorage should generally be provided

(4) laid-up ships should be in ballast condition in order to reduce the effects of wind. Due consideration should be given to the still water bending moment. For guidance, normal ballast draft should be roughly between 30% and 50% of the maximum draft.

**2.** Ships should normally be moored singly. However, when several ships are moored together, the following provisions are to be made:

(1) Ships are to be moored bow to stern.
(2) Ships are to be of approximately the same size.
(3) the number of ships moored together is, in principle, not to exceed six.
(4) Breast-lines are to be of similar elasticity.
(5) Fender are to be provided.

## 404. Review of the mooring arrangements

**1.** At the Owners' request, the mooring arrangements may be reviewed by the Society. The proposal for the mooring arrangements is in such case to be submitted by the Owner and is to include the following information.

(1) Mooring site:
(A) geographical area (to be specified on a map)
(B) characteristics of the sea bottom
(C) water depth
(D) effects of wind/tide/current indicated according to statistical studies
(E) wave characteristics (amplitude, periods)

(2) Geometry of mooring arrangements:
(A) ship's position and direction
(B) shore anchorage
(C) diagram showing mooring equipment (fore and aft)
(D) angle between chain cables and ship's centreline

(3) Characteristics of mooring equipment:
(A) maximum holding strength of each anchor
(B) type of mooring lines (chains, cables, sinkers, etc.)
(C) length of each section, weight of each section, mechanical characteristics of each section (breaking load)
(D) weight of sinkers.

**2.** On completion of the installation, the mooring arrangements are to be surveyed by the Society. When the ship is anchored, the underwater installation is to be inspected by a diver whose report is to be presented to the Society.

**3.** It is the responsibility of the Owners to ascertain the efficiency of the mooring arrangements during the laid-up period. The mooring arrangements are to be re-examined at regular intervals (at least each year when the ship is anchored) and when abnormal weather conditions occur at the laid-up site.

# Section 5 Types of Laid-UP

## 501. General

### 1. Choice of the type and extent of laid-up

(1) The extent to which a Ship Owner will lay-up its ship depends on various factors, including:

(A) expected period of lay-up
(B) need to reduce overhead running/operational costs
(C) anticipated time to resumption of trading
(D) time and expenses needed for re-commissioning
(E) intended situation after re-commissioning (trade, repair yard, scrap yard)
(F) age of the ship
(G) value of the ship in respect to scrap/recycling value.

### 2. Type of laid-up

(1) Depending on the type of laid-up, hot or cold laid-up as detailed **502.** and **503.**, the degree of involved risk varies and the P&I Policies on return of calls will be different between these two types of laid-up condition. In addition to the absence of cargo on-board and the criteria listed herebelow, the presence, or absence, of seamen on-board is a key differentiation for determination of the type of laid-up, of the subsequent increased or reduced P&I risks.

## 502. “Hot”laid-up

### 1. Period

This laid-up condition is normally appropriate for up to 12 months out of commission. The P&I Policies normally require the ship to be laid-up for at least 30 consecutive days in order to qualify for a laid-up return.

### 2. Manning

The ship has reduced crew on-board as the ship’s manning is generally reduced below the manning level required under the Flag State safe manning document and in accordance with any applicable requirement from other involved parties, namely local authorities and insurance companies.

### 3. Machinery operation

The ship has some of the machinery maintained under working conditions and kept operational by the skeleton crew on-board.

### 4. re-commissioning

The ship can be reactivated with reduced cost, time and effort, normally in the range of less than 1 week recommissioning time.

## 503. "Cold" lay-up

### 1. Period

This laid-up condition is normally appropriate over 12 months out of commission.

### 2. Manning

(1) A specialist laid-up personnel may be employed, possibly only one or more watchmen, in order to deal with emergency requirements related mainly to fire, flooding, mooring and security aspects.

(2) Requirements and guidance from the Flag State, the local authorities and the insurance companies should there again also be investigated and complied with by the Owner, before deciding on the final manning level.

### 3. Machinery operation

The machinery is normally shut-down.

## 4. Re-commissioning

(1) The ship is normally re-commissioned within a period in the range of 3 weeks, or more depending on the effective period of laid-up and on the level and scope of maintenance and preservation implemented by the Owner.

(2) The ship might need to be directly dry-docked before trading, depending on the efficiency of the hull preservation during the lay-up period, on the possible hull degradation and depending on the classification requirements for maintenance of class in case the bottom survey in dry-dock became overdue during the lay-up period.

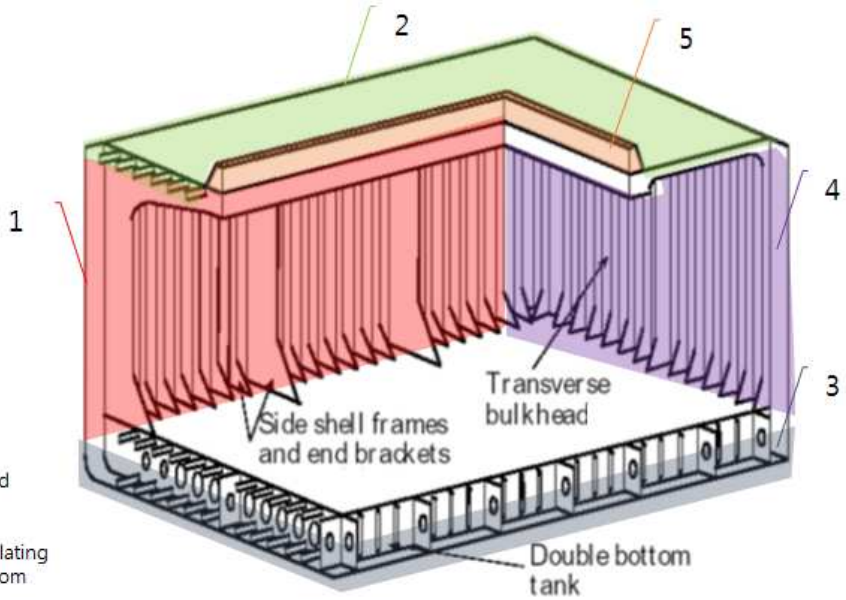
(3) On modern ships, the efficient preservation maintenance of automated systems, computerized equipment and electronic gears is to be carefully planned and considered by the Owner, in order to ensure that these sophisticated systems will no deteriorate and will restart correctly.

(4) More generally speaking, a cold laid-up situation is to be carefully prepared by the Owner, in terms of manning, laid-up site, mooring arrangements, safety and security conditions, preservation, maintenance and inspection measures, classification survey requirements, in collaboration and consultation with all other Parties, in order to avoid machinery or hull degradation, long term damages to the machinery and a subsequent costly and long reactivation. ⚓

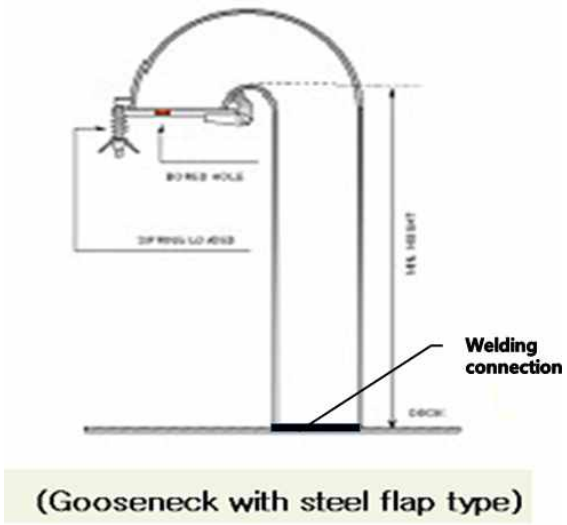
# Annex 1-18 In case of promptly and thoroughly repaired, Areas to be considered *(2019)*

**1.** In case of promptly and thoroughly repaired specified in **Ch 2, 107. 2** of the Rules, examples of areas to be considered for General Ship, Bulk Carrier, Double Skin Bulk Carrier and Double Hull Oil Tanker are as follows

(1) General Ship




1. Side Shell frames, their end attachments and adjacent shell plating
2. Deck structure and deck plating
3. Bottom structure and bottom plating
4. Watertight or oiltight bulkheads
5. Hatch coamings







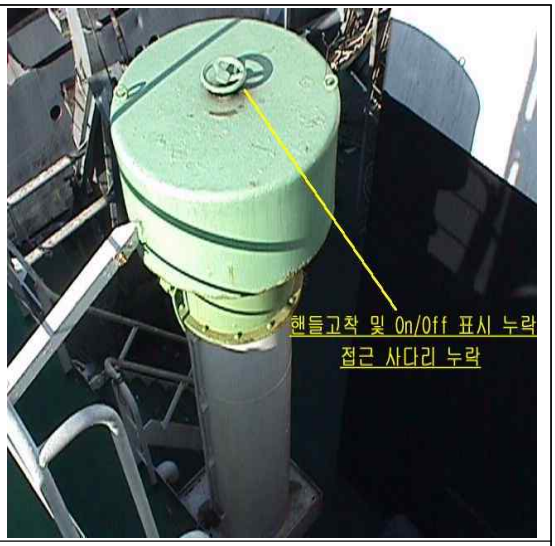
6. Examination of the weld connection between air pipes and deck plating (**Ch 2, 202. 1** (1) (f) of the Rules)





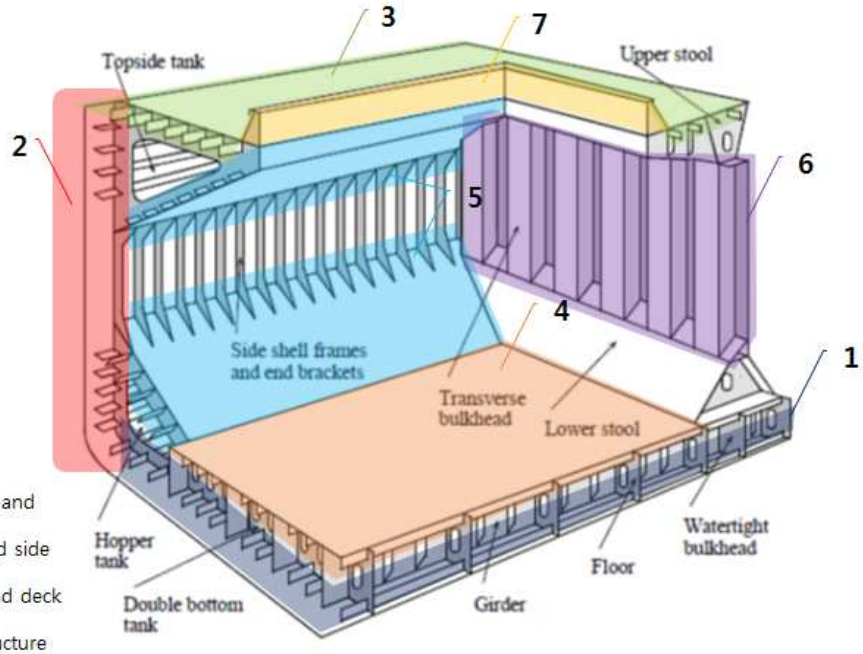

7. External examination of all air pipe heads installed on the exposed decks (**Ch 2, 202. 1** (1) (g) of the Rules)





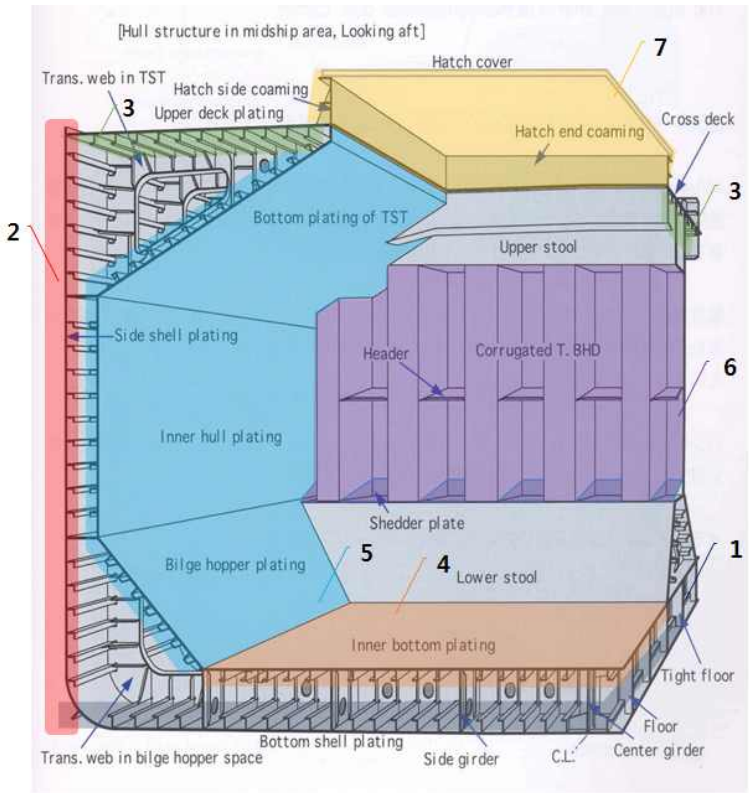

8. Examining the ventilators and air pipes, including their coamings and closing appliances (**Ch 2, 202. 1** (6) of the Rules)

(2) Bulk Carrier



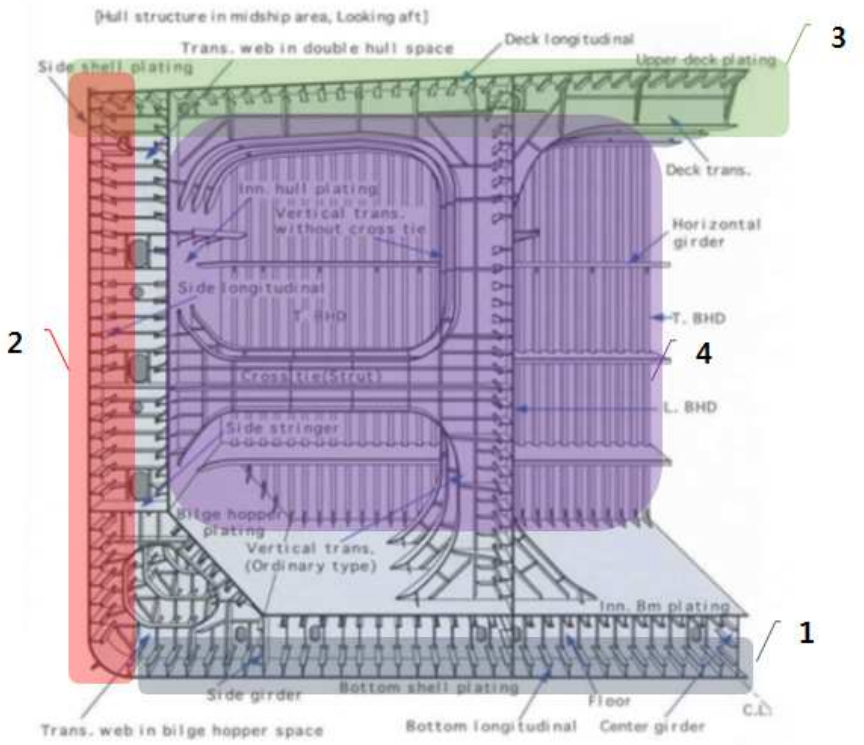

1. Bottom structure and bottom plating
2. Side structure and side plating
3. Deck structure and deck plating
4. Inner bottom structure and inner bottom plating
5. Inner side structure and inner side plating
6. Watertight or oiltight bulkheads
7. Hatch coamings

(3) Double Skin Bulk Carrier




1. Bottom structure and bottom plating
2. Side structure and side plating
3. Deck structure and deck plating
4. Inner bottom structure and inner bottom plating
5. Inner side structure and inner side plating
6. Watertight or oiltight bulkheads
7. Hatch covers and hatch coamings

(4) Double Hull Oil Tanker




1. Bottom structure and bottom plating
2. Side structure and side plating
3. Deck structure and deck plating
4. Watertight or oiltight bulkheads

Rules for the Classification of Steel Ships
Guidance Relating to the Rules for the Classification of Steel Ships

# PART 1 CLASSIFICATION AND SURVEYS

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