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ISTHMUS BUREAU OF SHIPPING

Rev. 03 December 2017

PRINCIPLES FOR THE CLASSIFICATION AND CONSTRUCTION OF STEEL SHIPS

PART 1B: CLASS SURVEY REGULATIONS

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PRINCIPLES FOR THE CLASSIFICATION AND CONSTRUCTION OF STEEL SHIPS

PART 1B CLASS SURVEY REGULATIONS

Chapter 1 GENERAL

1.1 Surveys

1.1.1 Classification Surveys

1. All ships intended to be classed with the Society are to be subjected to Classification Surveys by the Surveyor in accordance with the requirements of **Chapter 2.**

2. Classification Surveys are composed of the following Surveys.

(1) Classification Survey during Construction

(2) Classification Survey of Ships Not Built under Survey

1.1.2 Class Maintenance Surveys

1. Ships classed with the Society are to be subjected to Class Maintenance Surveys by the Surveyor in accordance with the requirements of **Chapter 3** through **Chapter 9**. In addition, in cases where any modification of ship classification details is needed, the ship is to comply with **2.5** in addition to the above requirements.

2. Class Maintenance Surveys consist of Periodical Surveys, Planned Machinery Surveys and Occasional Surveys, which are as specified in the following **(1)** to **(3)**. At each of these surveys, inspections, tests or examinations are to be carried out to verify that all necessary items are in good order.

(1) Periodical Surveys

(a) Annual Surveys

The surveys consist of general examinations of hull, machinery, equipment, fire-fighting equipment, etc. as specified in **Chapter 3.**

(b) Intermediate Surveys

The surveys consist of general examinations of hull, machinery, equipment, fire-fighting equipment, etc. and detailed examinations of certain parts as specified in **Chapter 4.**

(c) Special Surveys

The surveys consist of detailed examinations of hull, machinery, equipment, fire-fighting equipment, etc. as specified in **Chapter 5.**

(d) Docking Surveys

The surveys consist of bottom inspections normally carried out in a dry-dock or on a slip-way as specified in **Chapter 6.**

(e) Boiler Surveys

The surveys consist of open-up examinations and performance tests of boilers as specified in **Chapter 7** Propeller Shaft and Stern Tube Shaft Surveys.

The surveys consist of open-up examinations of propeller shafts and the stern tube shafts as specified in **Chapter 8**.

(2) Planned Machinery Survey

(a) Continuous Machinery Survey (*CMS*): The Survey consists of open-up examinations of machinery and equipment specified in **Chapter 9** of this Part which are to be carried out systematically, continuously and sequentially so that each survey interval for all *CMS* items does not exceed five years.

(b) Planned Machinery Maintenance Scheme (*PMS*): The Survey consists of open-up examinations of machinery and equipment specified in **Chapter 9** of this Part which are to be carried out according to the machinery maintenance scheme approved by the Society.

(3) Occasional Surveys

The surveys consist of examinations of the status (including damaged areas, repair work, and modifications) of hull, machinery and equipment which are carried out separately from **(1)** and **(2)** above.

1.1.3 Intervals of Class Maintenance Surveys

1. Periodical Surveys are to be carried out in accordance with the requirements specified in **(1)** through **(6)** below.

(1) Annual Surveys

Annual Surveys are to be carried out within three months before or after each anniversary date.

(2) Intermediate Surveys

Intermediate Surveys are to be carried out as specified in **(a)** or **(b)** below. Annual Surveys are not required to be carried out when an Intermediate Survey is carried out.

(a) Intermediate Surveys are to be carried out at the time of the second or the third Annual after the Classification Survey during Construction or a Special Survey; or

(b) In lieu of **(a)** above, Intermediate Surveys for bulk carriers, oil tankers and ships carrying dangerous chemicals in bulk that are over 10 *years* of age and general dry cargo ships of not less than 500 *gross* tonnage over 15 *years* of age may be commenced at any time between the second and third Annual Surveys and be completed at the time of the second or the third Annual Survey.

(3) Special Surveys

Special Surveys are to be carried out as specified in **(a)** through **(c)** below.

(a) Special Surveys are to be carried out within 3 *months* before the date of expiry of the *Certificate of Classification*;

(b) Special Surveys may be commenced at or after the 4th Annual Survey and be completed within 3 *months* before the date of expiry of the *Certificate of Classification*; or

(c) Notwithstanding **(b),** Special Surveys may be commenced prior to the 4th Annual Survey. In this case, the Special Survey is to be completed within 15 *months* from the date of commencement of the Special Survey.

(4) Docking Surveys

Docking Surveys are to be carried out as prescribed in **(a)** and **(b)** below.

(a) Concurrently with Special Surveys

(b) Within 36 *months* from the date of completion of the Classification Survey or the previous Docking Survey

(5) Boiler Surveys

Boiler Surveys are to be carried out as specified in **(a)** and **(b)** below. However, for ships where over eight *years* have elapsed since construction and that have only one main boiler, Boiler Surveys are to be carried out at Annual Surveys, Intermediate Surveys and Special Surveys.

(a) Concurrently with Special Surveys

(b) Within 36 *months* from the date of completion of the Classification Survey or the previous Boiler Survey

(6) Propeller Shaft and Stern Tube Shaft Surveys

Ordinary Surveys of the propeller shaft and stern tube shaft are to be carried out as specified in **(a)** to **(g)** below.

(a) Ordinary Surveys of Propeller shafts Kind 1 or stern tube shafts Kind 1 (hereinafter referred to as "shafts Kind 1" in this Chapter) are to be carried out within 5 *years* from the date of completion of the Classification Survey or the previous Ordinary Survey (Survey due date).

(b) Ordinary Surveys of propeller shaft Kind 1 (Kind 1C) with oil-lubricated stern tube bearings, may be postponed for not more than 3 *years* (5 *years*) from the date of completion of Partial Survey provided that the Partial Survey specified in **8.1.2-1** or **8.1.2-2** is carried out at the time prescribed in **(a)** above.

(c) The propeller shafts Kind 1 adopting the preventive maintenance system in accordance with the requirements of **8.1.3**; need not be withdrawn at the Ordinary Surveys. The shafts are to be withdrawn for examination at the times required on the basis of the results of the preventive maintenance

(d) Ordinary Surveys of Propeller shafts Kind 2 and stern tube shafts Kind 2 (hereinafter referred to as "shafts Kind 2" in this Chapter) are to be carried out as prescribed in **i)** and **ii)**.

i. Concurrently with Special Surveys

ii. Within 36 *months* from the date of completion of the Classification Survey or the previous Ordinary Surveys (Survey due date).

However, where the construction of the shaft in the stern tube bearing and shaft bracket corresponds to shaft Kind 1 but the construction of the shaft between the stern tube and the shaft bracket corresponds to shaft Kind

2, the shaft may be surveyed at the intervals prescribed in **(a)**, provided that examination required for the part corresponding to shaft Kind 2 is carried out at the times prescribed in **i)** and **ii)**.

(e) In applying (a) and (d) above, for Ordinary Surveys completed within 3 months before the survey due date, the survey due date will be regarded as the date of completion of this survey.

(f) In applying (b) above, for Partial Surveys or Confirmatory Surveys completed within 1 month before the survey due date, the survey due date will be regarded as the date of completion of this survey.

(g) For keyless connection shafts lubricated with water lubricated bearings, two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (NDE) is not to exceed 15 years. NDE generally refers to the magnetic particle method.

2. Planned Machinery Surveys are to be carried out as specified below in **(1)** and **(2)**.

(1) In the Continuous Machinery Survey, each survey item or part is to be examined at the interval not exceeding 5 *years*.

(2) In the Planned Machinery Maintenance Scheme, each survey item or part is to be examined according to the survey schedule table specified in **9.1.3** and at the general examination (including review of maintenance records) which is to be carried out every year.

3. The classed ships are to be subject to Occasional Surveys when they fall under one of the conditions of **(1)** through **(6)** below. Periodical Surveys may substitute for the Occasional Surveys where the survey items of the Occasional Surveys are inspected as a part of the Periodical Surveys.

(1) When main parts of hull, machinery or important equipment or fittings which have been surveyed by the Society, have been damaged, or are to be repaired, altered, or modified.

(2) When load lines are to be changed or to be newly marked.

(3) When an alteration affecting the ship's stability is made.

(4) When the Survey is requested by the owner.

(5) When the Survey is carried out to verify that the ships already constructed are in compliance with the retroactive requirements of the Rules.

(6) Whenever the survey is considered necessary by the Society.

1.1.4 Periodical Surveys Carried out in Advance

1. Special Surveys may be carried out in advance of the due dates of the Special Survey upon application by the Owner.

2. Annual Surveys and Intermediate Surveys may be carried out in advance of the due dates of each Survey upon application by the Owner. In this case, additional Periodical Surveys are to be carried out in accordance with the provisions specified otherwise by the Society.

3. Where a Periodical Survey other than an Annual Survey or an Intermediate Survey is carried out in advance at the due time of the Annual Survey or Intermediate Survey, the following requirements may be applicable.

(1) Where an Intermediate Survey or a Special Survey is carried out in advance at the due time of the Annual Survey, the Annual Survey may be dispensed with.

(2) Where a Special Survey is carried out in advance at the due time of the Intermediate Survey, the Intermediate Survey may be dispensed with.

1.1.5 Postponement of Surveys

1. Special Surveys, Docking Surveys ,Boiler Surveys and Ordinary Surveys for Propeller shafts Kind 2 may be postponed as specified in **(1)** or **(2)** below subject to the approval by the Society in advance. However, no postponement is to be permitted on the period of 36 *months* between any two Docking Surveys, Boiler Surveys and Ordinary Surveys for Propeller shafts Kind 2 respectively.

(1) Maximum 3 *months* for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed.

(2) Maximum 1 *month* for the ship engaged on short voyages.

2. In addition to **-1** above, Docking Surveys carried out concurrently with Special Surveys may be postponed 3 *months*, subject to the approval by the Society in advance, in exceptional circumstances such as 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.

3. In addition to **-1** above, Boiler Surveys specified in **1.1.3-1(5)(a)** and **(b)** may be postponed up to 3 *months*, subject to the approval by the Society in advance, in exceptional circumstances such as unavailability of repair facilities, unavailability of essential materials, equipment or spare parts, or delays incurred by action taken to avoid severe weather conditions.

4. Notwithstanding the requirement specified in **1.1.3-2**, Planned Machinery Surveys may be postponed as specified in **-1(1)** or **(2),** provided that such Surveys are carried out at the time of Special Surveys.

1.1.6 Modification of the Requirements

1. With respect to Periodical Surveys and Planned Machinery Surveys in cases where considered appropriate by the Society, the Surveyor may modify the requirements specified in **Chapters 3** through **9** of this Part based on the size, service engaged, construction, age, history, results of previous surveys and actual condition of the ship.

2. When the results of a Periodical Survey suggest the likelihood of heavy corrosion, defects etc., and the Surveyor considers it necessary, close-up surveys, pressure tests or thickness measurements are to be carried out. Thickness measurements procedures and submission of gauging results are to be in accordance with the requirements of **5.2.6-1.**

3. For tanks and cargo holds where effective coatings are found to be in a good condition, the extent of internal examination, close-up surveys or gauging requirements specified in Chapters 3 through 9 of this Part may be specially considered at the discretion of the Surveyor.

4. Continuous Hull Surveys

(1) At the request of the owner, the Society may approve ships (other than oil tankers, bulk carriers, ships carrying dangerous chemicals in bulk and general dry cargo ships of not less than 500 *gross tonnage*) to be exempt from detailed examinations of the tanks and compartments at the next Special Survey if these examinations (thickness measurements and pressure tests of tanks and compartments) are carried out based on the criteria for the next Special Survey in order and completed before the next Special Survey. This form of examination is referred to as a "Continuous Hull Survey". If the examination during the Continuous Hull Survey reveals any defects, the Surveyor may require further detailed examinations of other similar tanks and compartments. The Society may, where considered necessary, require the Continuous Hull Survey to be carried out by a method other than that specified above.

(2) For ships which are undergoing the Continuous Hull Survey, the Docking Survey specified in **1.1.3-1(4)(a)** may be carried out prior to the Special Survey, provided that the Docking Surveys are to be held twice or more by the date of expiry of the Certificate of Classification and that all the requirements of Chapter 6 are also complied with. The Docking Survey, however, is to be carried out within 36 *months* from the date of completion of the previous Docking Survey

(3) For ships which are undergoing the Continuous Hull Survey, internal examination of ballast tanks for ships more than 10 *years* of age is to be carried out as specified in **(a)** and **(b)** below.

(a) Concurrently with Special Surveys

(b) Concurrently with Intermediate Surveys

5. Where examinations from the Intermediate Survey to be carried out during the period between the 2nd and 3rd Annual Surveys may be omitted at the discretion of the Surveyor.

1.1.7 Bulk Carriers

1. For ships which are applicable to **Chapter 28B, Part 2,** a compliance survey for the requirements of **28B.2**, **28B.3** and **28B.4, Part 2** is to be carried out by the time specified in **Table 28B.1.3, Part 2** and, a compliance survey for the requirements of **28B.5** and **28B.6, Part 2** is to be carried out by the time specified in **Table 28B.5.1**, **Part 2** in addition to the surveys required in this chapter. Moreover, a compliance survey for the requirements of **28B.7, Part 2**is to be carried out. The thickness measurement examination included in the compliance survey for **28B.3**and **28B.5**, **Part 2**, is to be carried out as deemed appropriate by the Society. In this case, the gauging procedure and submitted report are to comply with the requirements of **5.2.6-1** in addition to the procedures specified separately.

2. For ships which are applicable to **Chapter 28B, Part 2**, continuing compliance with **28B.3** and **28B.5, Part 2**is to be verified at Special Surveys and Intermediate Surveys (for ships over 10 years of age) after the compliance survey specified in **-1**. For this purpose, the thickness measurements as deemed appropriate by the Society are to be carried out for the vertical corrugated watertight bulkhead abaft the foremost hold, in addition to those according to **Table 5.15.**

3. For ships which are required to carry out the annual thickness measurement for the vertical corrugated watertight bulkhead abaft the foremost hold as a result of the survey specified in **-1** or **-2**, the measurement is to be carried out at Annual Surveys in addition to those according to **Table 3.6.**

4. For ships which are applicable to **28B.2.1-2, Part 2**as a result of the survey specified in **-1**, the following surveys are to be carried out at periodical surveys in addition to the surveys required in this chapter.

At annual surveys, in addition to the requirements stipulated in **Chapter 3**, the following items are to be carried out for the foremost hold.

(1) For ships over 5 *years* and up to 15 *years* of age

i. An overall survey of the cargo hold

ii. A close-up survey of transverse bulkheads and a minimum of 25% of hold frames (including their upper and lower brackets and adjacent shell plating)

Where considered necessary by the Surveyor as a result of the survey, the survey is to be extended to include a close-up survey of all of the hold frames.

iii. Suspect areas identified at previous surveys

(2) For ships over 15 *years* of age

i. An overall survey of the cargo hold

ii. A close-up survey of transverse bulkheads and all hold frames (including their upper and lower brackets and adjacent shell plating)

iii. Suspect areas identified at previous surveys

(3) The thickness measurement is to be carried out to the minimum extent specified in **(a) ii)** and **iii)** or **(b)ii)** and **iii)** above as applicable. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Tables 5.16** through **5.20** for the structural members in which such corrosion is found.

1.1.8 Laid-up Ships

1. Laid-up ships are not subject to Class Maintenance Surveys specified in **1.1.2.** However, Occasional Surveys may be carried out at the request of owners.

2. When laid-up ships are about to be re-entering service, the following surveys and surveys for specific matters which have been postponed due to being laid-up, if any, are to be carried out.

(1) If the due dates for Periodical Survey or Planned Machinery Surveys have not transpired while the ship was laid-up, then a survey equivalent to the Annual Surveys specified in **Chapter 2** is to be carried out.

(2) If the due dates for Periodical Surveys or Planned Machinery Surveys have transpired while the ship was laid-up, then these Periodical Surveys or Planned Machinery Surveys are, in principal, to be carried out. However, where two or more kinds of Periodical Surveys are due, only the superlative survey may be carried out.

3. Surveys carried out under the requirements of **-2** above are to correspond to the age of the ship.

1.1.9 Machinery Verification Runs

At the time of dry-docking, a dock trial may be required at the discretion of the attending surveyor to confirm satisfactory operation of main and auxiliary machinery. If significant repairs have been carried out to main or auxiliary machinery or steering gear, the Surveyor may deem a sea trial necessary.

1.2 Specialized Ships, Installations, and Apparatus

1.2.1 Incinerators of Waste Oil and Waste Substance

Where incinerators of waste oil and waste substance are installed on board, they are to be examined to the satisfaction of the Surveyor.

1.2.2 Surveys of Special Ships

When an application is received from the shipowner and the Society judges that it is impractical to apply the requirements in this Part to the ship due to the special nature of its design, services and operating mode, the Society may modify times, items, scope, or extent of surveys as applicable.

1.3 Definitions

1.3.1 Terms

The definitions of terms which appear in this Part are as specified in the following. Terms not define here are as defined in other Parts of the Rules.

(1) "*Ballast tank*" is a tank which is being used solely for water ballast. For a tank which is used for both cargo and water ballast, the followings requirements of **(a)** and **(b)** below are applied.

(a) The tank is treated as a Ballast Tank when substantial corrosion has been found by internal examination of that tank.

(b) For oil tankers and ships carrying dangerous chemicals in bulk, the tanks used for the carriage of cargo or ballast water as a routine part of the vessel s operation are treated as Ballast Tanks. Cargo tanks in which water ballast might be carried only in exceptional cases per *MARPOL Annex I/18.3* are to be treated as cargo tanks.

(2) "*Close-up survey*" is a survey where the details of structural components are within the close visual inspection range of the Surveyor, i.e. preferably within reach of hand.

(3) "*Longitudinal members in the transverse section*" include all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and longitudinal bulkheads in the considered transverse section.

(4) "*Representative tanks/spaces*" are those which are expected to reflect the condition of other tanks/spaces of similar types and service and with similar corrosion prevention systems. When

selecting representative tanks/spaces account should be taken of the service and repair history on board and identifiable critical and or suspect areas.

(5) "*Suspect areas*" are locations showing substantial corrosion and/or are considered by the Surveyor to be prone to rapid wastage.

(6) "*Substantial corrosion*" is an extent of corrosion such that assessment of corrosion pattern indicates wastage in excess of 75% of allowable margins, but within acceptable limits. Notwithstanding the above, for the following **(a)** to **(c)**, substantial corrosion is an extent of corrosion such that the assessment of the corrosion pattern indicates a gauged (or measured) thickness which is within the range of 0.5 *mm* to the renewal thickness stipulated in the relevant provisions. "Renewal thickness" refers to the minimum allowable thickness below which the renewal of structural members is to be carried out.

(a) For ships complying with the provisions of *CSR-Bulk Carries* and *CSR-Tankers*.

(b) For hatch covers and hatch coamings for cargo holds of the ships stipulated otherwise by the Society.

(c) For transverse watertight bulkheads in cargo hold complying with the provision of **Chapter 28A, Part 2** or **Chapter 28B, Part 2.**

(7) "*Corrosion Prevention System*" is normally considered a full hard coating

(8) Coating condition is defined as follows:

"*Good*": condition with only minor spot rusting;

"*Fair*": condition with local breakdown of coating 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;

"*Poor*": condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

(9) "*Cargo length area*" is that part of the ship which includes all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces.

(10) "*Oil*" is petroleum including crude oil, heavy fuel oil, lubricating oil, light oil, kerosene, gas oil, and others prescribed by the relevant laws and regulations.

(11) "*Oil tankers*" are ships constructed or adapted for the carriage of oil in bulk and include chemical carriers intended to carry oil in bulk and combination carriers which are designed to carry either oil or solid cargoes in bulk, such as ore/oil carriers and ore/bulk/oil carriers.

(12) "*Double hull oil tankers*" are ships which belong to oil tankers specified in **(11)** above, which have the cargo tanks 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.

(13) "*Bulk carriers*" are ships defined as the following:

(a) Ships constructed or converted with a single deck, topside tanks and hopper side tanks in cargo spaces, and intended primarily to carry dry cargoes in bulk

(b) Ships constructed or converted with a single deck, two longitudinal bulkheads and a double bottom throughout the cargo spaces, and intended primarily to carry ore cargoes in the centre holds only.

(c) Combination carriers which are designed to carry either oil or solid cargoes in bulk, such as ore/oil carriers and ore/bulk/oil carriers, and have the same construction as the ships defined in **(a)** or **(b)** above.

(14) "*Double skin bulk carriers*" are ships, which belong to bulk carriers specified in **(13)** above, in which all cargo holds are bounded by a double-side skin (regardless of the width of the wing space).

(15) "*General dry cargo ships*" are ships constructed or converted to carry solid cargoes other than:

- bulk carriers;
- container carriers;
- ro-ro cargo ships;
- car carriers;
- refrigerated cargo ships;
- dedicated wood chip carriers; and
- dedicated cement carriers

(16) "*Ships carrying timber cargoes*" are cargo ships which belong to general dry cargo ships specified in **(15)** above and which have marked timber load lines in accordance with the requirements in *ILLC* or primarily carry log cargoes.

(17) "*Anniversary Date*" is the day corresponding to the expiry date of the Classification Certificate, excluding the expiry date of the Classification Certificate.

(18) The terminology used in the application of propeller shaft and stern tube shaft surveys is as specified in the following **(a)** to **(h)**:

(a) "Shafts" mean propeller shafts as specified in the following **(b)** and stern tube shafts as specified in the following **(c)**.

(b) "Propeller shaft" is the part of the propulsion shaft to which the propeller is fitted.

(c) "Stern tube shaft" is a shaft placed between the intermediate shaft and propeller shaft, normally arranged within a stern tube or running in open water.

(d) "Stern tube" is a tube or pipe fitted in the shell of a ship at the stern (or rear part of the ship), through which passes the stern tube shaft or aftermost section of the propeller shaft.

"Stern tube" is the housing of the shaft bearings that sustain the shaft and also accommodates the shaft sealing arrangement.

(e) "Stern tube sealing system" means the equipment installed on the inboard extremity and, for oil or freshwater lubricated bearings, at outboard extremity of the stern tube. An "inboard seal" is the device fitted on the fore part of the stern tube that achieves the sealing against the possible leakage of the lubricant media into the ship internal. An "outboard seal" is the device fitted on the aft part

of the stern tube that achieves the sealing against the possible sea water ingress and the leakage of the lubricant media.

(f) "Oil lubricated" means closed loop oil lubricating systems which use oil to lubricate the bearings and are sealed against the environment by adequate sealing or gland devices.

(g) "Freshwater lubricated" means closed loop water lubricating systems which use fresh water to lubricate the bearings and are sealed against the environment by adequate sealing or gland devices.

(h) "Water lubricated" means open water lubricating systems where bearings are cooled and lubricated by water (salt or fresh) which are exposed to the environment.

1.4 Preparation for Surveys and Miscellaneous

1.4.1 Notification

When a ship is to be surveyed in accordance with the Rules, it is the responsibility of the owners to notify the Surveyor at the place where they wish to undergo the survey. The Surveyor is to be advised of the survey a reasonable time in advance so that the survey can be carried out at the proper time.

1.4.2 Preparation for Surveys

1. All such preparations as required for classification, periodical and other surveys and thickness measurements specified in this part as well as those which may be required as necessary by the Surveyor in accordance with the provisions in this Part are to be made by the Owners or their representatives at their responsibilities. The preparations are to include provisions of an easy and safe access, necessary facilities, certificates and records for the execution of the survey and thickness measurements, open-up examinations of equipment, removal of obstructions and cleaning.

Inspection, measuring and test equipment, which Surveyors rely on to make decisions affecting classification are to be individually identified and calibrated to a standard deemed appropriate by the Society. However, the Surveyor may accept simple measuring equipment (e.g. rulers, measuring tapes, weld gauges, micrometers) without individual identification or confirmation of calibration, provided they are of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces. The Surveyor may also accept equipment fitted on board a ship and used in examination of shipboard equipment (e.g. pressure, temperature or rpm gauges and meters) based either on calibration records or comparison of readings with multiple instruments.

2. An applicant is to submit a Survey Programme that details survey items as part of the preparation for the Special Survey of oil tankers, bulk carriers and ships carrying dangerous chemicals in bulk with integral tanks and for the Intermediate Surveys of bulk carriers, oil tankers and ships carrying dangerous chemicals in bulk with integral tanks over 10 *years* of age. To ships which do not engage in international voyage and classed for

restricted service, such as having the class notation *Coasting Service*, *Smooth Water Service*, etc., this requirement need not apply.

3. An applicant for survey(s) is to arrange a supervisor (hereinafter referred to as owner s representative) who is well conversant with the intended survey items for the preparation of the survey in order to provide the necessary assistance to the Surveyor according to his requests during the surveys.

4. Prior to the commencement of survey and measurement, a survey planning meeting is to be held by the surveyor(s), the owner s representative, the thickness measurement company representative, where involved, and the master of the ship or an appropriately qualified officer of the ship appointed by the master, ship owner or Company so as to ensure the safe and efficient conduct of the survey and measurement work to be carried out.

1.4.3 Suspension of Surveys

Surveys may be suspended where necessary preparations as specified in **1.4.2-1** and **-2** have not been made, any appropriate attendant in accordance with **1.4.2-3** is not present, or the Surveyor considers that the safety for execution of the survey is not ensured.

1.4.4 Disposition when Repairs are Considered Necessary as a Result of Surveys

When repairs are considered to be necessary as a result of surveys, the Surveyor notifies his findings to the survey applicant. The applicant, when he receives such notification, is to obtain the Surveyor s verification after carrying out the necessary repairs.

1.4.5 Procedure for Tests, Wear and Tear, etc.

1. Speed Trial

A Speed trial is to be carried out at the Class Maintenance Survey, where alterations or repairs which might affect the ship’s speed have been made. A Speed trial or a trial of the ship’s propulsion machinery may be required where deemed necessary by the Surveyor at any survey.

2. Inclining Test

An Inclining test is to be carried out at the Class Maintenance Survey, where alterations or repairs which might greatly affect the ship’s stability have been made and/or the Surveyor deems it necessary.

3. Repairs for Wear and Tear

Where the thicknesses of materials of hull structure, scantlings of equipment, etc. become less than the stipulated wear and tear limits, these are to be replaced by new ones having either the original scantlings at the time of construction or the scantlings deemed appropriate by the Society. As regards to structural members with scantlings that have been reduced by virtue of an approved system of corrosion control under **1.1.19**, **Part 2**, the reduction is to be included as part of the corrosion when taking measurements. Where, however, the original scantlings were larger than the required ones, or where deemed appropriate by the Surveyor, allowances may be made in regards to location, extent, kind, etc. of the wear and tear.

4. Replacement of fittings, equipment and parts, etc.

In cases where it is necessary to replace any fittings, equipment or parts, etc. used onboard, replacements are to comply with the regulations to be applied during ship construction. However, in cases where new requirements are specified or where deemed necessary by the Society, the Society may require that such replacements comply with any new requirements in effect at the time the relevant replacement work is carried out. In addition, replacements are not to use any materials which contain asbestos.

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey during Construction

2.1.1 General

1. In the Classification Survey during construction, the hull and equipment, machinery, fire protection and detection, means of escape, fire extinction, electrical installation, stability and load lines are to be examined in detail in order to ascertain that they meet the relevant requirements in the Rules.

2. The new installation of materials which contain asbestos is to be prohibited.

2.1.2 Submission of Plans and Documents for Approval

1. When it is intended to build a ship for classification by the Society, the following plans and documents are to be submitted for the approval by the Society before the work is commenced. The plans and documents may be submitted for examination by the Society prior to making an application for the classification of the ship as stipulated otherwise by the Society.

(1) Hull

(a) General arrangement

(b) Midship section (cross sections of the hold, machinery space, and areas containing wing tanks (if fitted); intended classification characters and notations, designed maximum load draught, and for ships complying with the requirements in **1.1.10-1 or -2 of Part 2**, design temperature are to be indicated in this plan.)

(c) Stem, stern frame, propeller post and rudder (indicating materials and the ship's speed)

(d) Construction profile (showing arrangement of watertight bulkheads, the load draught, sizes of brackets and transverse sections of the ship at 0.1 *L* and 0.2 *L* from both ends of the ship)

(e) Deck plans (indicating arrangement and construction of hatchways, hatch beams, etc.)

(f) Single bottoms and double bottoms

(g) Watertight and oil tight bulkheads (indicating the highest position of tank and positions of tops of overflow pipes)

(h) Superstructure end bulkhead (with details of closing appliances of openings on the bulkheads)

(i) Arrangements to resist panting in both peaks and their vicinity

(j) Pillars and deck girders

(k) Shell expansion (Dimensions and arrangements of freeing ports and draught at ballast condition (for ships which comply with the requirements in **1.1.10-1 or -2 of Part 2**are to be indicated in this plan.)

(l) Shaft tunnels

(m) Seating of boilers, engines, thrust and plummer blocks, dynamos and other important auxiliary machinery (indicating horse powers, heights and weights of main engines, and arrangements of holding down bolts)

(n) Machinery casings

(o) Long deckhouses, if fitted

(p) Masts, mast houses and winch platforms

(q) Plans showing locations, sizes and details of equipment forming part of the watertight and weather-tight integrity of the ship, including piping

(r) Pumping system (indicating capacity of each tank, water or oil)

(s) For ships equipped for loading timber cargoes: height of timber cargo, and loading/securing equipment and their locations.

(t) Construction for fire protection and plans showing ventilation systems (indicating materials used in the construction of superstructures, bulkheads, decks, deckhouses, trunks, stairways, deck coverings, etc. and arrangements of closing appliances of openings)

(u) Plans showing means of escape (escape routes including details of passage width, etc.)

(v) Plans showing fire extinguishing arrangement (the locations, numbers and types of fire fighting systems, fire extinguishers, fire pumps, hydrants, hoses, fire fighter s outfits, etc. and the layout of the fire detection and alarm system). For ships equipped with inert gas systems, the locations of these systems (general layout; piping diagrams with materials, dimensions, design pressure of pipes, valves, etc.; details of each component; and diagrams of control devices including monitoring, alarm and safety devices of the systems.)

(w) Plans showing arrangement for means of access or ship structure access manuals as applicable, as defined in **Chapter 32, Part 2** and **Chapter 26, Part 12.**

(x) Navigation bridge visibility:

Plans and data specified in **Chapter 10, Part 5** where the ship's length overall (Loa) is 55 *m* or over.

(y) Venting systems for tankers

i. General arrangement of bilge systems and ventilation systems of the cargo oil pump room.

ii. General arrangement of venting systems for cargo vapors, etc.

(z) Plans showing arrangement of the ship's identification number specified in **1.1.22, Part 2.**

i. Towing and mooring fittings arrangement plan specified in **2.2, Part 5** or **23.2, Part 12.**

ii. Arrangement of the means of embarkation and disembarkation specified in **22.8, Part 2** or **21.8, Part 12.**

(2) Machinery

(a) Arrangement of machinery in machinery space, diagram for internal communication systems (including diagram for engineers alarm systems)

(b) Main and auxiliary engines (including their attachments):

Plans and data specified in **2.1.2**, **3.1.2** and **4.1.2**, **Part 7** in relation to the kind of engine

(c) Power transmission gears, shafting and propellers:

Plans and data specified in **5.1.2**, **6.1.2**, **7.1.2** **and** **8.1.2**, **Part 7**

(d) Boilers, incinerators and pressure vessels:

Plans and data specified in **9.1.3**, **9.13.2** **and** **10.1.4**, **Part 7**

(e) Auxiliary machinery and piping:

Plans and data specified in **13.1.2**, **14.1.2** **and** **17.1.2**, **Part 7**

(f) Steering gear:

Plans and data specified in **15.1.3, Part 7**

(g) Automatic and remote controls:

Plans and data specified in **18.1.3**, **Part 7**

(h) Spare parts:

List of spare parts specified in **Chapter 19**, **Part 7**

(i). Electrical installations

Plans and data specified in **1.1.6**, **Part 8**

(3) Ships carrying liquefied gases in bulk

(a) Manufacturing specifications for cargo tanks, insulations and secondary barriers (including welding procedures; inspection and testing procedures for welds and cargo tanks; properties and installation procedures of insulation materials and secondary barriers; and working standards)

(b) Details of cargo tank construction

(c) Arrangement of cargo tank accessories including details of fittings inside the tanks

(d) Details of cargo tank supports, deck portions through which cargo tanks penetrate, and their sealing devices

(e) Details of secondary barriers

(f) Specifications and standards of materials (including insulations) used for cargo piping system in connection with design pressure and/or temperature

(g) Specifications and standards of materials of cargo tanks, insulations, secondary barriers and cargo tank supports

(h) Layout and details of attachment for insulations

(i) Constructions of cargo pumps, cargo compressors and their prime movers

(j) Piping diagrams of cargo hold, cargo gauging system, and cargo tank venting system

(k) Constructions of main parts of refrigeration systems

(l) Piping diagrams of refrigerant for refrigeration systems

(m) Bilge arrangements and ventilation system in hold spaces or interbarrier spaces, cargo pump room, cargo compressor room, and cargo control room

(n) Arrangement of sensors for gas detectors, temperature indicators, pressure gauges

(o) Diagrams of inert gas lines and details of pressure adjusting devices, where hold spaces or interbarrier spaces are filled by inert gases

(p) Details of pressure relief device and drainage systems for leakage of liquefied cargo in hold spaces or interbarrier spaces

(q) Sectional assembly, details of nozzles, fitting arrangement and details of fittings for various pressure vessels

(r) Details of valves for special purposes, cargo hoses, expansion joints, filters, etc. for cargo piping system.

(s) Piping diagram, constructions and particulars of utilization units, where cargo is used as fuel.

(t) Electric wiring plans and a table of electrical equipment in dangerous spaces.

(u) Arrangement of earth connections for cargo tank, pipe lines, machinery, equipment, etc.

(v) Plans showing dangerous spaces.

(w) Plans showing arrangements for personnel protection (the locations, numbers, sizes, and types of protective equipment, safety equipment, stretcher and medical first-aid equipment; where deemed necessary, the locations, numbers, sizes, and types of respiratory protection for emergency escape purpose, the location of decontamination showers, an eye-wash and emergency shelters, and the type of equipment in the cargo control room).

(x) For independent tank of Type *B*, programs of the non-destructive test for periodical surveys.

(y) For membrane and semi-membrane tanks and internal insulation tanks, programs of the examination and testing of cargo containment systems for periodical surveys.

(4) Ships carrying dangerous chemicals in bulk

(a) Manufacturing specifications for independent cargo tanks (including materials to be used, welding procedures and inspection and testing procedures for weld and cargo tanks).

(b) Details of cargo tank construction

(c) Arrangements of cargo tank accessories (including details of fittings inside the tanks).

(d) Details of independent cargo tank supports, deck portions through which cargo tanks penetrate and their sealing devices when provided.

(e) Coating or lining procedure of inside of the cargo tanks, and corrosion test results of such coating or lining, if required.

(f) Plans showing arrangement and the methods of attachment of the insulation together with the working procedure concerned.

(g) When the cargoes are required to be cooled, the plans and information in accordance with **(3)(a), (f), (g), (h)** and **(p)** are to be submitted depending upon the cargo storage plan and the type of cargo tank construction.

(h) Cargo pump construction plan including list of materials to be used and their specifications.

(i) Piping arrangement in cargo tank area.

(j) Cargo tank ventilation arrangement.

(k) Ventilation plan of cargo pump rooms, pump rooms, cofferdams, double bottoms, etc.

(l) Diagram of monitoring and measurement system for cargo level, cargo temperature, etc. and the detail construction of the equipment.

(m) Control system for cargo temperatures.

(n) Piping diagrams and constructions of environmental control systems such as inerting, padding, drying and ventilation systems.

(o) Instruments for cargo vapor detection (listed by applicable cargo).

(p) Electrical wiring plans and a table of electrical equipment used in dangerous spaces.

(q) Arrangement of earth connections for cargo tanks, pipe lines, machinery and equipment, only when flammable cargoes are intended to be loaded.

(r) Plans showing dangerous spaces.

(s) Plans showing arrangement for personnel protection (the locations, numbers, sizes, and types of protective equipment, safety equipment, stretcher and medical first-aid equipment and the locations of decontamination showers and an eye-wash).

(5) Plans and documents for in-water surveys specified in **6.1.2-2.**

(6) Other plans and documents not specified in **(1)** through **(5)** which are deemed necessary by the Society.

2. The plans mentioned in **-1** are to indicate in detail the quality of materials used, scantlings and arrangements of structural members, their attachments, clearance between the bottom of boilers and the top of floors, and other particulars necessary for examination of proposed constructions.

3. A stability information booklet required in **2.3.2** is to be submitted for approval by the Society, in addition to the plans and documents as listed in **-1.**

4. For ships that are required to have a loading manual in accordance with the requirements of **Chapter 31, Part 2,** and **Chapter 25, Part 12,** the loading manual is to include conditions for loading and other necessary information and is to be submitted for approval by the Society, in addition to the plans and documents listed in **-1.**

5. For ships that are required to have a loading computer in accordance with the requirements of **Chapter 31, Part 2**, lines (provided with offset table), light load hydrostatic curves, tank capacity plan (finished plan), and the results of inclining tests are to be submitted to the Society, in addition to the plans and documents specified in **-1**. However, part or whole of these plans and documents may be omitted in cases where the requirements are separately provided by the Society.

6. Notwithstanding **-1** and **-2**, part of the plans and documents specified in **-1** and **-2** may be omitted in accordance with the requirements stipulated otherwise by the Society, in cases where a ship or machinery is built at the same place of manufacture based on plans and documents which have already been approved.

7. For ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk an operation manual is to be submitted for approval by the Society.

8. For ships that are required to have a damage control plan in accordance with the requirement of **Chapter 30, Part 2**, the damage control plan is to be submitted for approval by the Society, in addition to the plans and documents as listed in **-1.**

9. For ships that are required to have emergency towing arrangements in accordance with the requirements of **Chapter 2, Part 5**, drawings indicating locations of emergency towing arrangements and construction of the part of the hull where the emergency towing arrangements are installed are to be submitted for approval by the Society, in addition to the plans and documents listed in **-1.**

10. For ships that are required to have an operating and maintenance manual for the door and inner door in accordance with the requirements of **Chapter 22, Part 2** or **Chapter 21, Part 12,** the operating and maintenance manual is to be submitted for approval by the Society.

11. For dedicated seawater ballast tanks of all type of ships of not less than 500 gross tonnage engaged on international voyages and double-side skin spaces arranged in bulk carriers engaged on international voyages of 150m in length and upwards as defined in **Chapter 28A, Part 2**, the Coating Technical File is to be submitted for review by the Society.

2.1.3 Submission of Other Plans and Documents

1. When it is intended to build a ship to the classification with the Society the following plans and documents are to be submitted, in addition to those required in **2.1.2**:

(1) Specifications for hull and machinery

(2) Calculation sheets for the minimum section modulus of the midship cross section

(3) Corrosion prevention scheme (Items included in the Coating Technical Files specified in **2.1.2-11** may be omitted.)

(4) Where provisions are to be made for exceptional conditions of loading, plans showing the particulars of the cargo intended to be carried and its distribution

(5) For ships that are required to have stability information documents, the following plans and documents:

- (a) General arrangement
- (b) Midship section
- (c) Longitudinal section at center line (showing the arrangement and size of hull constructions and cargoes on deck which are counted to the projected area against wind and/or buoyancy)
- (d) Construction profile
- (e) Lines (including an offset table)
- (f) Arrangement of openings (showing the position, size and closing devices of openings)
- (g) Stability calculation sheets (showing the details of calculation of projected area against winds, free surface effect and maximum permissible height of center of gravity)
- (h) Plans showing the arrangement, size and projected lateral area of bilge keels, if fitted.

(6) For ships complying with the requirements in *ILLC*, the following plans:

(a) General arrangement

(b) Midship section

(c) Construction profile or structural arrangement

(d) Deck plans (showing the freeboard and superstructure decks)

Where the structural arrangement plans (with details of scantlings and arrangements of members in hatchways) are submitted, the submission of the deck plans may be dispensed with.

(e) Superstructure end bulkheads

(f) Lines

(g) Hydrostatic curves (indicating the displacement and the change of displacement per cm immersion at each draught up to the freeboard deck)

(h) Plans showing the height of timber deck cargo and the arrangements of lashing and fixing, if the ships are to be marked with the timber load lines in accordance with the requirements in *ILLC*

(7) For ships carrying liquefied gases in bulk, the following plans and documents:

(a) Basic design principal and technical reports of cargo containment systems

(b) Data on test method and result of model test carried out in compliance with the requirements of *Chapter 4, IGC Code- IMO*

(c) Data on notch toughness, corrosiveness, physical and mechanical properties of materials and welded parts at the minimum design temperature and room temperature, where new materials or welding methods are adopted for constructing the cargo tanks, secondary barriers, thermal insulations, etc.

(d) Data on design loads stipulated in *Chapter 4, IGC Code- IMO.*

(e) Calculation sheets of cargo tanks and supports stipulated in *Chapter 4, IGC Code- IMO***.**

(f) Data on test analysis and results of model tests carried out to demonstrate strength and performance of cargo tanks, thermal insulations, secondary barriers, and cargo tank supports

(g) Calculation sheets on heat transfer between the primary members of the cargo tank under various loading conditions, where considered necessary by the Society

(h) Calculation sheets on the thermal stress on primary members of the cargo tank at the temperature distributions stipulated in (g), where considered necessary by the Society

(i) Calculation sheets of temperature distribution on hull structure, where considered necessary by the Society

(j) Specifications of cargo systems

(k) Composition and physical properties of cargoes (including a saturated vapour pressure diagram within the necessary temperature range)

(l) Calculation sheets of relieving capacity for pressure relief valves of cargo tank (including calculation of the back pressure in cargo vent system)

(m) Calculation sheets for capacity of refrigeration systems

(n) Cargo piping arrangement

(o) Calculation sheets of filling limits for cargo tanks

(p) Arrangements of access manholes stipulated in *Chapter 3, IGC Code-IMO* in cargo tank area and the guide for access through these manholes

(q) Calculation for ship survival capability stipulated in *Chapter 2, IGC Code-IMO***.**

(r) Equipment for personnel protection stipulated in *Chapter 14, IGC Code-IMO***.**

(8) For ships carrying dangerous chemicals in bulk, the following plans and documents:

(a) Lists showing chemical and physical properties and other special properties of all cargoes intended to be loaded.

(b) Loading plans of dangerous chemicals coming within the scope of *IBC Code-IMO* and other chemicals loaded simultaneously with these dangerous chemicals

(c) Data on reactivity hazard of cargo in relation to other chemicals or water; self-reactionary traits such as polymerization, and; where it is deemed necessary, hazardous reactivity with heating or cooling media. However, for chemicals not intended to be loaded simultaneously with the dangerous chemicals coming within the scope of *IBC Code-IMO***,** this information may be excluded.

(d) Data on reactivity hazard between intended cargoes and coating or lining in cargo tanks and of piping and equipment that may come into contact with cargo liquid or vapor.

(e) Data on compatibility of corrosion-resistant materials and cargoes having corrosive properties

(f) Strength calculation of each cargo tank and, where deemed necessary, thermal stress calculation

(g) For loading cargoes that require heating; capacity calculation of heating system.

(h) Plans and documents in accordance with **(7)(e), (f), (g), (h), (k)** and **(m)** depending upon the cargo storage plan and the type of cargo tank construction when the cargoes are required to be cooled.

(i) Arrangements of access manholes stipulated in *Chapter 3, IBC Code-IMO* in cargo tank area and the guide for access through these manholes.

(j) Calculation for ship survival capability stipulated in *Chapter 2, IBC Code-IMO*.

(k) Equipment for personnel protection stipulated in *Chapter 14, IBC Code-IMO.*

(9) Capacity calculation sheet for pressure/vacuum valves and overpressure protective devices of cargo oil tanks, if any.

(10) Instruction and operation manual of the inert gas system (including cautionary notes for the safety of the operators), if any.

(11) Strength calculation sheets (noting the design load) associated with various supporting hull structures of towing and mooring fittings, including towing and mooring fittings which are not selected from standards approved by the society, for ships complying with **2.2, Part 5** or **23.2, Part 12.**

(12) For ships that are required to have emergency towing arrangements in accordance with the requirements of **2.3, Part 5,** an operation manual of the emergency towing arrangements.

2. Submission of other plans and documents not specified in -1 may be required where deemed necessary by the Society.

2.1.4 Presence of Surveyor

1. The presence of the Surveyor is required at the following stages of the work in relation to hull and equipment:

(1) When the tests for the materials prescribed in **Part 10** and the equipment prescribed in **Part 5** are carried out.

(2) When the materials or parts manufactured away from the site are being applied to the ship concerned.

(3) When the tests of welding prescribed in **Part 11** are carried out.

(4) When designated by the Society during shop work or sub-assembly.

(5) When each block is assembled.

(6) When hydrostatic tests, watertight tests and non-destructive tests are carried out.

(7) When the hull is completed.

(8) When performance tests are carried out on closing appliances of openings, remote control devices, steering gears, anchoring and mooring equipment, emergency towing arrangements, means of embarkation and disembarkation (specified in **22.8, Part 2** or **Chapter 21.8, Part 12**), fire fighting systems, piping, etc.

(9) When rudder installation, keel line profiling, measurement of principal dimensions, measurement of hull deflection, etc. are carried out.

(10) When a loading computer is installed on board ships that require it in accordance with the requirements of **Chapter 31, Part 2**.

(11) When the ships are marked with the load lines in accordance with the requirements in *ILLC*.

(12) When sea trials are carried out.

(13) When stability experiments are carried out.

(14) When emergency towing arrangements are installed on board ships that require them in accordance with the requirements of **2.3, Part 5**.

(15) When installation of fire extinguishing systems and their performance tests are carried out.

(16) When the ship's identification number is marked.

(17) When deemed necessary by the Society.

2. The presence of the Surveyor is required at the following stages of the work in relation to machinery:

(1) When the tests of materials of main parts of machinery prescribed in **Part 10** are carried out.

(2) Main parts of machinery

(a) When the tests stipulated in either **Part 7** or **Part 8** (according to the kind of machinery) are carried out.

(b) When the materials are assembled for construction of the parts and the parts are assembled for installation on board.

(c) When machining of the main parts is finished and, if necessary, at appropriate stages during machining.

(d) In case of welded construction, before welding is commenced and when it is completed.

(e) When shop trials are carried out.

(3) When main parts of machinery are installed on board.

(4) When performance tests are carried out on measurement instruments, remote control devices of closing appliances, remote control devices for machinery and gears, automatic control devices, steering gear, mooring equipment, fire extinguishing equipment, piping, etc.

(5) When sea trials are carried out.

(6) When deemed necessary by the Society.

3. For ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk, the presence of the Surveyor is required for tests stipulated in *IGC Code-IMO* and *IBC Code-IMO* respectively, in addition to the tests stipulated in **-1** and **-2**.

4. The requirements specified in **-1, -2** and **-3** may be modified having regard to the actual status of facilities, technical abilities and quality control at the place of manufacture, except in the case of sea trials.

5. For the tests specified in **-1, -2** and **-3,** the applicant is to prepare test plans for review by the Society prior to testing. Test records and/or measurement records are to be submitted to the Society, as required.

2.1.5 Hydrostatic Tests, Watertight Tests, and Relevant Tests

In the Classification Survey during construction, hydrostatic tests, watertight tests, and other relevant tests are to be carried out in accordance with the following:

(1) Hull and equipment

(a) Hydrostatic tests or watertight tests are to be carried out after all work in connection with watertightness are completed but before painting, in accordance with the requirements specified in **Table 2.1.**

(b) A part or all of the hose tests may be dispensed with at the discretion of the Society.

(c) Watertight tests may be replaced by airtight tests at the discretion of the Society, provided that certain tanks designated by the Society are to be subjected to hydrostatic tests specified in **Table 2.1**, while afloat.

(2) Machinery

Hydrostatic, leakage or airtight tests are to be carried out as specified in each Chapter of **Part 7** of the Rules in relation to the kind of machinery.

(3) Ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk.

For ships carrying liquefied gases in bulk, hydrostatic tests, leakage tests, or airtight tests as stipulated in *IGC Code-IMO* are to be carried out in addition to the tests stipulated in **(1)** and **(2)**. For ships carrying dangerous chemicals in bulk, hydrostatic tests, leakage tests, or airtight tests are to be carried

out in accordance with the requirements stipulated otherwise by the Society in addition to the tests stipulated in **(1)** and **(2).**

2.1.6 Documents to be maintained on Board

1. At the completion of a classification survey, the Surveyor confirms that the finished versions of the following applicable drawings, plans, manuals, lists, etc., are on board.

(1) Documents approved by the Society or their copies:

(a) Operating and maintenance manuals for the door and inner door (**22.3.10 and 22.4.9, Part 2** or **21.3.10** and **21.4.9, Part 12**)

(b) Damage control plans (**30.3.1, Part 2**)

(c) Loading manuals (**Chapter 31, Part 2** or **Chapter 25, Part 12**)

(d) Ship structure access manuals (**32.2.6, Part 2** or **Chapter 26.2.6, Part 12**)

(e) Stability information booklets (*Chapter 1, Part 4, Chapter 2, IGC Code-IMO and Chapter 2, IBC Code-IMO)*

(f) Operation manuals for ships carrying liquefied gases in bulk (*Chapter 18, IGC Code-IMO*)

(g) Operation manuals for ships carrying dangerous chemicals in bulk (*Chapter 16, IBC Code-IMO*)

(h) Cargo handling plans (*Chapter 17, IGC Code IMO, and Chapter 15, IBC Code-IMO*)

(i) Lists of loading/filling limits (*Chapter 15 and 17, IGC Code-IMO and Chapter 15, IBC Code-IMO*)

(j) For independent tank of Type *B*, programs of the non-destructive test for periodical surveys (**Table 5.27**)

(k) For membrane and semi-membrane tanks and internal insulation tanks, programs of the examination and testing of cargo containment systems for periodical surveys (Note (*1) to **Table 5.27**)

(l) Coating Technical File (**Chapter 24, Part 2, Chapter 22, Part 12**) *and* (*Section 5 Chapter 3, CSR-B and Section 6, CSR-T*)

(m) Plans and documents for in-water surveys (**6.1.2-2**)

(2) Other documents

(a) Towing and mooring fitting arrangement plans (**2.2, Part 5** or **23.2, Part 12**)

(b) Operation manuals for the emergency towing arrangement (**2.3, Part 5**)

(c) Booklets for damage control and Damage Stability Information (**30.3.2, Part 2)**

(d) Operation manuals for the loading computer (**31.1.3-3, Part 2**)

(e) Plans for means of access (**32.1.5, Part 2** or **26.1.5, Part 12**)

(f) Operation manuals for the stability computer (**Chapter 1, Part 4**) and (*Chapter 2, IGC Code and Chapter 2 IBC Code-IMO*)

(g) Operating and maintenance instructions for ship machinery and equipment (**1.3.9, Part 7**)

(h) Manuals for the water level detection and alarm systems (**13.8.5-4** or **13.8.6-3, Part 7**)

(i) Maintenance records of batteries (**1.1.7, Part 8**)

(j) Instruction manuals for the cargo tank venting systems (**4.5.3, Part 6**)

(k) Fire Control Plans, Fire Safety Operational Booklets, Training manuals and Maintenance plans (**Chapters 14**, **15** and **16, Part 6**)

(l) Operation manuals for the helicopter facilities (**Chapter 18, Part 6**)

(m) Instruction manuals for the inert gas systems (**35.2.11, Part 6**)

(n) A copy of the *IGC Code-IMO* or national regulations incorporating the provisions of the *IGC Code-IMO*.

(o) A copy of the *IBC Code-IMO* or national regulations incorporating the provisions of the *IBC Code-IMO*.

(p) Emergency Towing Procedures (**2.4, Part 5** or **23.3, Part 12**)

(3) Finished plans specified in **2.1.7**

2. For ships engaged on international voyages, the Surveyor confirms that the Ship Construction File contains the necessary documents from the following drawings, plans, manuals and documents, and that the Construction File is on board the ship. Duplicate documents as in -1 are not required.

(1) Finished plans of hull structural drawings specified in **2.1.7**

(2) The following manuals and documents:

(a) Operating and maintenance manuals for the door and inner door (**22.3.10, Part 2** or **21.3.10, Part 12**)

(b) Damage control plans (**30.3.1, Part 2**)

(c) Loading manuals (**Chapter 31, Part 2** or **Chapter 25, Part 12**)

(d) Stability information booklets (**Chapter 1, Part 4,**)

(3) Ship structure access manuals (**Chapter 32, Part 2** or **Chapter 26, Part 12**)

(4) Copies of certificates of forgings and castings welded into the hull structures

(5) Plans showing locations, sizes and details of equipment forming part of the watertight and weather-tight integrity of the ship, including piping (**2.1.2-1(1)(q)**)

(6) Corrosion prevention scheme (**2.1.3-1(3)**)

(7) Plans and documents for in-water surveys (**6.1.2-2**)

(8) Docking plan including locations and other necessary information of all penetrations specified in item 3 in **Table 6.1**

(9) Coating Technical File **(***Section 5 Chapter 3, CSR-Bulk Carriers and Section 6, CSR-Tankers*)

(10) Plans and documents for Anti-Fouling Systems

(11) Test plans, test records, measurement records, etc.

3. Considering the purpose, characteristics, etc. of the ship, the submission of additional documents may be deemed necessary by the Society.

4. For ships of not less than 500 gross tonnage engaged on international voyages, it is recommended that all documents listed in -1 above are marked with the *IMO* ship identification number.

5. At the completion of classification surveys, Surveyors confirm that certificates showing that the following devices have passed all required examinations or tests are maintained on board.

(1) Fire pumps (including emergency fire pumps)
(2) Fire hoses and nozzles
(3) Fire extinguishers (including spare charges)
(4) Fire-fighter s outfits
(5) Emergency escape breathing devices
(6) Fixed fire-extinguishing systems
(7) Fire dampers and power-operated closing doors
(8) Fixed fire detection and fire alarm systems and automatic sprinkler systems
(9) Fire protection materials
(10) Additional equipment required for ships carrying dangerous goods (electrical equipment of an explosion-proof type, detection systems, full protective clothing, portable fire extinguishers and water spraying systems)
(11) Deck foam systems (nozzles and foam concentrates)
(12) Inert gas systems (portable oxygen content meters)
(13) Equipment for protection of cargo pump rooms (temperature sensing devices and hydrocarbon gases concentration meters)
(14) Watertight doors below the freeboard deck
(15) Side scuttles

2.1.7 Finished Plans

At the completion of a classification survey during construction, the applicant is to prepare finished plans regarding the following drawings, etc., and submit them to the Society.

(1) General arrangement
(2) Midship section, scantling plans (construction profile), deck plans, shell expansion, transverse bulkheads, plans for rudder and rudder stock, and plans for cargo hatch covers
(3) Bilge, ballast and cargo piping diagrams
(4) Fire protection plans
(5) Fire extinguishing appliances arrangement
(6) Plans and data showing the navigation bridge visibilities

2.1.8 Verification of Coating Application

The following items will be carried out by the Society prior to reviewing the Coating Technical File for the coatings of internal spaces subject to **24.2.2, Part 2; 22.4.2, Part 12;** (*Section 5 Chapter 3, CSR-Bulk Carriers or Section 6 CSR-Tankers)*:

(1) Check that the Technical Data Sheet and Statement of Compliance or Type Approval Certificate comply with the *PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPE OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS* (*IMO Performance Standard for Protective Coatings / IMO resolution MEPC.215 (82)* as may be amended), however, the Statement of Compliance or Type Approval Certificate is to be a certificate deemed appropriate by the Society.

(2) Check that the coating identification on representative containers is consistent with the coating identified in the Technical Data Sheet and Statement of Compliance or Type Approval Certificate in **(1)** above.

(3) Check that the inspector is qualified in accordance with the qualification standards deemed appropriate by the Society.

(4) Check that the inspector s reports of surface preparation and the coating s application indicate compliance with the manufacturer s Technical Data Sheet and Statement of Compliance or Type Approval Certificate in **(1)** above.

(5) Monitor implementation of the coating inspection requirements deemed appropriate by the Society.

2.2 Classification Survey of Ships not built Under Survey

2.2.1 General

1. In the Classification Survey of ships not built under the Society s survey, the actual scantlings of main parts of the ship are to be measured in addition to such examination of the hull and equipment, machinery, fire protection and detection, means of escape, fire fighting system, electrical installations, stability and load lines 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.

2. For ships subject to Classification Survey of ships not built under the Society's survey, plans and documents necessary for registration to the Society are to be submitted according to the relevant requirements in **2.1.2** and **2.1.3.**

3. For ships with class of another Classification Society or a ship whose class, assigned by another classification Society has lost their validity subject to classification survey, the following plans and documents are to be submitted for approval:

(1) The last Certificate of Classification.

(2) All the survey records of the surveys carried out during the period lapsed from the last special survey for there new of the class.

(3) Documents of anchors and chain cables.

(4) General ship's specification

(5) General arrangement plan

(6) Midship section plan with the most typical trans-verse sections.

(7) Construction profile
(8) Shell expansion
(9) Deck plans (indicating arrangement and construction of hatchways, hatch beams, etc.)
(10) Stem, stern frame, propeller post and rudder
(11) Stability Information.
(12) Construction for fire protection and plans showing ventilation systems (indicating materials used in the construction of superstructures, bulkheads, decks, deckhouses, trunks, stairways, deck coverings, etc. and arrangements of closing appliances of openings)
(13) General arrangement plans of machinery and equipment in the machinery spaces.
(14) Shaft tunnels
(15) Piping diagrams (air, overflow and sounding pipes diagrams)
(16) Plans of boilers and pressure vessels
(17) Key diagram and explanation of electric propulsion control gears
(18) Arrangement plan (including specifications of main parts such as circuit breakers, fuses, instruments and cables) and circuit diagrams of main switchboard and emergency switchboard.
(19) Approved means of cargo control (Loading manual).

4. If the ship-owner cannot submit for approval the documents indicated in **3.4.1** or can only submit part of them, then it will guarantee that the Society receives all the necessary information during the survey.

5. For ships that are required to have a loading manual in accordance with the requirements of **31.1.1** and **31.3.1, Part 2,** and **25.1.1, Part 12**, the loading manual (including the conditions for loading and other necessary information) is to be submitted for approval by the Society.

6. For ships carrying liquefied gases in bulk, the operation manual stipulated in *Chapter 18, IGC Code-IMO* is to be submitted for approval by the Society. For ships carrying dangerous chemicals in bulk, the operation manual stipulated in *Chapter 16, IBC Code-IMO* is to be submitted for approval by the Society.

7. For ships that are required to have a damage control plan in accordance with the requirements of **Chapter 30, Part 2**, the damage control plan is to be submitted for approval by the Society.

8. For ships that are required to have emergency towing arrangements in accordance with the requirements of **2.4, Part 5,** drawings indicating locations of emergency towing arrangements and construction of the part of the hull where the emergency towing arrangements are installed are to be submitted for approval by the Society.

9. For ships that are required to have an operating and maintenance manual for the door and inner door in accordance with the requirements of **22.3.10-1** and **22.4.9-1, Part 2** or **Chapter 21.3.10-1** and **21.4.9-1, Part 12**, the operating and maintenance manual is to be submitted for approval by the Society.

2.2.2 Hydrostatic Tests, Watertight Tests, and Relevant Tests

In the Classification Survey prescribed in **2.2.1,** sea trials are to be carried out after the following items have been completed: hydrostatic tests and watertight tests in accordance with the requirements shown below in **(1)** and **(2)**; maintenance of machinery and determination of the working pressure of the boilers; and adjustment of

safety valves and accumulation tests of the boilers. Tests and trials may be dispensed with at the discretion of the Society with the exception of hydrostatic tests of boilers and pressure vessels of which important parts have been newly repaired, main steam pipes, and air tanks of which the interior cannot be inspected; and tests for gas leakage of refrigerating machinery on board.

(1) Double bottoms, both peaks, tanks, cofferdams and chain lockers, watertight bulkheads and shaft tunnels are to be tested as specified in **2.1.5(1)**

(2) Hydrostatic, leakage or airtight tests are to be carried out on machinery and its parts at the pressures specified in the relevant chapters of **Part 7.**

2.2.3 Documents to be maintained on Board

At the completion of a classification survey, the Surveyor confirms that documents specified in **2.1.6** are on board the ship.

2.3 Sea Trials and Stability Experiments

2.3.1 Sea Trials

1. In the Classification Survey of all ships, sea trials specified in following **(1)** to **(10)** are to be carried out in full load condition, in the calmest possible sea and weather condition and in deep unrestricted water. However, where sea trials cannot be carried out in full load condition, sea trials may be carried out in an appropriate loaded condition.

(1) Speed test
(2) Astern test
(3) Steering test and the change-over test from the main to auxiliary steering gears
(4) Turning test. The turning test of an individual ship may be dispensed with, provided that sufficient data is available from the turning test of a sister ship and subject to special approval by the Society.
(5) Confirmation of no abnormality for the operating condition of machinery and behavior of the ship during the trials
(6) Performance test of windlasses
(7) Performance test of automatic and remote control systems for main propulsion machinery, controllable pitch propellers, boilers and electric generating sets
(8) Accumulation test of boilers
(9) Measurement of torsional vibration for the shafting systems
(10) Other tests were deemed necessary by the Society

2. In the steering test prescribed in -1(3), the steering capabilities required by **15.2.2** and **15.2.3** **Part 7** of the Rules are to be confirmed. Where it is impractical to perform the test with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions

of the main engine and maximum design pitch, ships may demonstrate compliance with this requirement by one of the following methods:

(1) During sea trials, the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch (in case of the auxiliary steering gear, one half of this speed or 7 knots, whichever is greater).

(2) Where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed is to be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed is to result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch (in case of the auxiliary steering gear, one half of this speed or 7 knots, whichever is greater).

(3) The rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. The speed of the ship is to correspond to the number of maximum continuous revolutions of the main engine and maximum design pitch of the propeller (in case of the auxiliary steering gear, one half of this speed or 7 knots, whichever is greater).

3. The results of the tests specified in -1 are to be submitted to the Society as Sea trial records.

4. In the case of classification Survey of ships not built under the Society s survey, the above tests may be dispensed with, provided that sufficient data on the previous tests are available and no alteration affecting the tests specified in **-1** have been made after the previous tests and the Society deems it appropriate.

2.3.2 Stability Experiments

1. In the Classification Survey, stability experiments are to be carried out upon completion of the ship. In addition, a stability information booklet, which is to be prepared on the basis of the particulars of stability determined by the results of stability experiments and to be approved by the Society, is to be provided on board.

2. In the Classification Survey of ships not built under the Society s survey, 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 after the previous experiments.

3. The stability experiments of an individual ship may be dispensed with, provided that reliable stability data is obtained from the stability experiments of a sister ship or other adequate means and a special approval is given by the Society.

4. Where a computer for stability calculation is on board the ship as a supplement to the stability information booklet, an operation manual for the computer is to be provided on board. After the computer is installed on board, a functional test to ensure that it is working correctly is to be carried out.

2.4 Loading Tests

2.4.1 Ships Carrying Liquefied Gases in Bulk

1. Where a test requires intended cargoes to be actually loaded in the cargo tank for the classification survey, but the ship cannot be loaded with its intended cargo, the test may be carried out at the first loading after completion of the classification survey. In this case, this test is to be carried out as an occasional survey in the presence of the Surveyor.

2. In the Classification Survey of ships not built under the Society s survey, for ships which have enough service records, all or a part of the tests may be dispensed with at the discretion of the Society.

2.5 Alterations

2.5.1 Examinations of Altered Parts

In cases where ships classified by the Society undergo repairs, alternations, modifications and outfitting related thereto (hereinafter referred to as modifications, etc.), such ships are to continue to at least comply with any previously applicable requirements. Moreover, such ships, if constructed before the date on which any relevant amendments enter into force, are, as a rule, to comply with any requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such modifications, etc. The modification, etc. of any main particulars are to satisfy the requirements for ships constructed on or after the date on which any relevant amendments enter into force. In cases where ships undergo modifications, etc. which affect main particulars, unless otherwise permitted by the Society, the concerned ship is to comply with requirements in force at the time of such modifications, etc.

Table 2.1 Hydrostatic Test

No.	Applicable areas	Type of tests and pressure/head	Notes
1	Double botton	Hydrostatic test with a head of water up to the top of the air pipe or the bulkhead deck, whichever is the greater	The center girder between tanks that carry the same liquid need not be tested.
2	Deep tanks	Hydrostatic test with a head of water up to the load waterline, or top of overflow pipe, or 2.45*m* above the tank top, or 2/3 *H* from the tank top, whichever is the greatest, where *H* is the height from the tank top to the upper end of *D*	Where it is impracticable to carry out hydrostatic tests for each tank and cofferdam on the dry-dock with the specified test head levels, the tests may be carried out with the water up to the ballast water line. After the ship is launched, the tests can be carried out with the water up to the levels required in this table.
3	Cargo tanks and cofferdams of oil tankers	Hydrostatic test with a head of water up to the level of 2.45*m* above the deck at side forming the crown of the tank or 0.6m above the top of hatch, whichever is the greater	
4	After peaks and stern tube compartments	Hydrostatic test with a head of water up to the load waterline. For portions above load waterline, hose test with a pressure of water not less than 0.2 *MPa* in the hos*e*.	Where they are used as tanks, tests are as specified in column No.2
5	Forepeaks	Hydrostatic test with a head of water up to the load waterline or to the waterline corresponding to the draught of 2/3 *D*, whichever is the greater. For portions above this waterline, hose tests with a pressure of water not less than 0.2 *MPa* in the hose.	where they are used as tanks, tests are as specified in column No.2
6	Chain lockers	Hydrostatic test with a head of water up to the top of chain lockers.	_____
7	Shell Plating	Hose test with a pressure of water not less than 0.2 *MPa* in the hose.	For shell plating of the areas listed in rows No.1 through No.6. refer to the corresponding row.
8	Watertight decks		For decks of the areas listed in rows No.2 through No.6. refer to the corresponding row.
9	Watertight bulkheads and recesses		When part of deep tanks or peak tanks, refer to the corresponding row.

10	shaft tunnels and other watertight tunnels		
11	Hatechways with weathertight steel covers		To be tested in closed position
12	Double plate rudders	Hydrostatic test with a head of 1.5*D* or 2*d*, whichever is the smaller, or airtight test with a pressure of 0.05*MPa*	

Note: Tests of piping systems in each part of the ship are to be carried out as specified in **Chapters 12.6, 13.17 and 14.6, Part 7**.

Chapter 3 ANNUAL SURVEYS

3.1 General

3.1.1 Surveys Equivalent to Special Surveys

Surveys equivalent to Special Surveys may be required when considered necessary by the Society, based on the service and repair history of the ship or damage history of similar ship types or ships with similar tanks and spaces.

3.1.2 Survey for Combination Carriers

At Annual Surveys for combination carriers such as ore/oil carriers and ore/bulk/oil carriers, the surveys are to be carried out in accordance with the relevant requirements in this Chapter, considering the ship's equipment, structural configuration and past operational experience.

3.2 Annual Surveys for Hull, Equipment, Fire Extinction and Fittings

3.2.1 Examination of Plans and Documents

At Annual Surveys, the management conditions of plans and documents listed in **Table 3.1** are to be examined.

3.2.2 General Examination

At Annual Surveys, examinations of hull, equipment, fire-extinction and fittings listed in **Table 3.2** are to be carried out.

3.2.3 Performance Test

At Annual Surveys, performance tests listed in **Table 3.3** are to be carried out.

3.2.4 Internal Examinations of Spaces and Tanks

At Annual Surveys, the internal examinations **(1)** and **(2)** below are to be carried out.

(1) Spaces and Tanks listed in **Table 3.4**

(2) Suspect areas identified at previous survey (excluding cargo tanks of oil tankers, ships carrying dangerous chemicals in bulk and ships carrying liquefied gases in bulk)

3.2.5 Close-up Surveys

At Annual Surveys, close-up surveys listed in **Table 3.5** are to be carried out.

3.2.6 Thickness Measurements

At Annual Surveys, the thickness measurements **(1)** and **(2)** below are to be carried out. As to the gauging equipment and thickness measurement report, the provisions of **5.2.6-1** are to be applied correspondingly as well.

(1) Spaces and Tanks listed in **Table 3.6.**

(2) Suspect areas identified at previous survey (excluding cargo tanks of oil tankers, ships carrying dangerous chemicals in bulk and ships carrying liquefied gases in bulk).

3.2.7 Pressure Test

At Annual Surveys for oil tankers and ships carrying dangerous chemicals in bulk, a pressure test is to be carried out on the piping system when deemed necessary by the Surveyor as a consequence of the general examination of item No.22 specified in **Table 3.2.**

3.3 Annual Surveys for Machinery

3.3.1 General Examinations

1. At Annual Surveys for Machinery, general examination of all the machinery in the engine room and the following examinations **(1)** through **(3)** are to be carried out:

(1) It is to be ascertained that the main propulsion machinery, power transmission machinery, shafting systems, prime movers other than main propulsion machinery, boilers, thermal oil heaters, incinerators, pressure vessels, auxiliaries, piping systems, control systems, electrical installations and switchboards are placed in good order.

(2) It is to be ascertained that the engine room, boiler spaces and means of escape are placed in good order with respect to dangers of fire and explosion.

(3) For ships adopting the preventive maintenance system in accordance with the requirements in **8.1.3,** the records of the parameters monitored are to be reviewed and a general examination is to be carried out in order to ascertain that the relevant installations have been well maintained.

2. At Annual Surveys for tankers, it is to be ascertained that each pump foundation and ventilation system in cargo pump rooms and electrical installations in hazardous areas are placed in good order in addition to the items in **-1** above.

3.3.2 Performance Tests

1. At Annual Surveys for Machinery, performance tests for the systems and devices listed in **Table 3.7** are to be carried out in order to ascertain that they are in good working order.

2. At Annual Surveys for tankers and ships carrying dangerous chemicals in bulk, in addition to the requirements specified in **Table 3.7**, the installations and devices specified in **Table 3.8** are to be subjected to the performance tests.

3.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

3.4.1 General

In addition to the requirements of 3.2 and 3.3, the requirements of 3.4 apply to Annual Surveys of ships carrying liquefied gases in bulk. Examinations of inerter cargo tanks or spaces may be omitted at the discretion of the Surveyor.

3.4.2 Examinations

At Annual Surveys for ships carrying liquefied gases in bulk, structures and equipment of the spaces specified in **Table 3.9** are to be generally examined in order to ascertain them being in good order. The extent of the survey may be increased to include performance tests, operation tests, open-up examinations, where deemed necessary by the Surveyor.

3.5 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

3.5.1 General

In addition to the requirements of 3.2 and 3.3, the requirements of 3.5 apply to Annual Surveys of ships carrying dangerous chemicals in bulk.

3.5.2 Examinations

At Annual Surveys of ships carrying dangerous chemicals in bulk, examinations of spaces, structures, fittings and equipment specified in Table 3.10 are to be carried out. The extent of the survey may be increased to include performance tests, operation tests, open-up examinations, etc. where deemed necessary by the Surveyor.

Table 3.1 Examination of Plans and Documents

Items	Examination
1 Loading Manual	For ships required to have the manual on board in accordance with the requirements of 31.1.1 and 31.3.1, Part 2, and 25.1.1, Part 12, confirmation that the manual is kept on board is to be made.
2 Stability Information Booklet	Confirmation to whether the booklet is kept on board is to be made.
3 Damage Control Plan, Booklet and Damage Stability Information	For ships required to have the damage control plan on board in accordance with the requirement in Chapter 30, Part 2, confirmation that the approved plan in exhibited and the booklet containing he

	information shown in the plan and the damage stability information are kept on board is to be made.
4 Fire Control Plan	Confirmations that the fire control plan is exhibited and properly stored is to be made
5 Operating and Maintenance Manual for the door and inner door and notices indicating procedures for closing and securing	For ships required to have the manual and notices on board in accordance with the requirements in **Chapter 22, Part 2**, and **Chapter 21, Part 12**;
	. Confirmation that the manual is kept on board is to be made.
	. Confirmation that the board is exhibited is to be made.
6 Instruction Manuals for the Inert Gas System	For ships required to have the manual on board in accordance with the requirements of **4.5.5, Part 6**, confirmation that the manual is kept on board is to be made.
7 Towing and Mooring Fitting Arrangement Plan	Confirmation that the Towing and Mooring Fitting Arrangement Plan specified in **2.2, Part 5** **or** **23.2, Part 12** is kept on board is to be made
8 Ship Structure Access Manual	For ships required to have the manual on board in accordance with the requirements of **32.2.6, Part 2,** **or** **26.2.6 Part 12**, confirmation that the manual is kept on board and update as necessary is to be made.
9 Documents related to the surveys for bulk carriers, oil tankers and ships carrying dangerous chemicals in bulk with integral tanks	Confirmation that the manual are kept on board is to be made.
10 Coating Technical File/or Corrosion Resistant Steel Technical file	For ships required to have a Coating Technical File on board in accordance with the requirements of **24.2.2, Part 2**, **or** **22.4.2, Part 12**, confirmation that the file is kept on board and that maintenance and repair work are properly recorded in the file is to be made.

Table 3.2 General Examination

Items	Examination
1 Shell plating	Confirmation that areas visible above the load waterline are in good condition.
2 Weather deck plating	
3 Openings on deck and outside of the hull	Confirmation that the following are in good condition: coamings and closing appliances of hatchways and flush deck openings on the exposed deck and within unenclosed superstructures; gangway ports, cargo ports and coal ports; and side scuttles below the freeboard or superstructure deck.

4 Casings of engine room	Confirmation that the following are in good condition: exposed engine casings and their openings; and skylights of the engine room and boiler room and their closing appliances.
5 Ventilators	Confirmation that coamings and closings appliances of ventilators to spaces below the freeboard deck or within enclosed superstructures are in good condition.
6 Air pipes	Confirmation that the air pipes on weather deck and their closing appliances are in good condition
7 Watertight bulkhead, superstructure end bulkhead and deckhouses	Confirmation that watertight doors, penetration and stop valves on watertight bulkheads, and closing appliances of openings in superstructure end bulkheads, deckhouses or companions protecting hatchways giving access to spaces below freeboard deck are in good condition.
8 Load line marks	Confirmation that deck line and load line markings are appropriate.
9 Bulwark	Confirmation that bulwarks and the shutters of its freeing ports; and hinges and guard rails are in good condition.
10 Means of access	Confirmation that permanent gangways or other means of access are in good condition.
11 Scupper, inlets, other discharge pipes and valves	Confirmation that all areas which can be examined are in good condition.
12 Securing arrangement for on-deck timber	Confirmation that securing arrangement for on-deck timber including eye plates, lashing wires , etc. is in good condition regardless of timber freeboard markings.
13 Anchoring and mooring arrangement	Confirmation that the anchoring and mooring arrangements including their accessories are in good condition as far as can be seen.
14 Fire extinguishing arrangement	Confirmation that the fire extinguishing arrangement is in good condition and the fixed fire extinguishing system, semi-portable and portable fire extinguishers and fireman´s outfits and emergency fire pumps are maintained in good order.
15 Fire protection arrangement and means of escape	Confirmation that no alteration has been made to these arrangements since the last survey.
16 Sails and their accessories	Confirmation that sails and their accessories are in good condition. They are to be in place and ready for unfolding at the time of examination.
17 Towing and mooring fitting	Confirmation that the mark of Safe Working Load *(SWL)* on towing and mooring fittings of ships required to have this mark as specified in **2.2.2** or **2.2.3 Part 5** or **23.2.2** or **23.2.3 Part 12** is clearly visible and fittings are in good condition.
18 Emergency towing arrangement	Confirmation that the emergency towing arrangement of ships required to have one in accordance with the provisions of **2.3 Part 5** in good condition.
19 Loading computer	Confirmation that the computer of ships required to have one in accordance with the provisions of **31.1.1** **and** **31.3.2 Part 2** is maintained in good order.
20 Ship Identification Number	Confirmations that the markings of the ship´s identification number for ships required to be so marked are in good condition.
21 Means of embarkation and disembarkation	Confirmation that the means of embarkation and disembarkation are in good condition.
22 Bow doors, inner doors, side shell doors and stern doors	Confirmation that the bow doors, inner doors, side shell doors and stern doors are in good conditions.
Additional Requirement for Tankers, Ships Carrying Dangerous Chemical in bulk and ships Carrying Liquefied Gases in bulk	
23 Piping	Confirmation that cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in cargo pump room, cargo compressor rooms and on weather decks are in good condition.

Additional Requirement for Bulk Carries over 10 years of age	
24 Piping in the cargo holds	Confirmation that all piping penetrations in cargo holds, including overboard piping are in good condition.
Additional Requirement for Geneal Dry Ships of not less than 500 g*ross tonnage* and over 15 years of age	
25 Piping in the cargo holds	Confirmation that all piping penetrations in cargo holds, including overboard piping are in good condition.

Note:

Examination of suspect areas identified at previous surveys is to be carried out.

Table 3.3 Performance Tests

Items	Tests
1 Weathertight hatch covers	Hose test listed in **Table 2.1** (when deemed necessary by the Surveyor). Random checking of the satisfactory operation of mechanically operated hatch covers including hydraulic and power components, wires, chains and link drives. For mechanically operated hatch covers on bulk carriers, hatch cover sets within the forward $0.25L_f$ and at least one additional set, including hydraulic and power components, wires, chains and link drives, are to be checked at least once every 5 *years* between special surveys.
2 Closing appliances of watertight door watertight bulkheads and openings on superstructure end bulkheads, deckhouses or companions protecting hatchways giving access to spaces below freeboard deck.	Checking whether the appliances work in good order is to be made as deemed necessary by the Surveyor. Hose tests listed in **Table 2.1** or equivalent tests are to be carried out. Such tests may be dispensed with at the discretion of the Surveyor.
3 Appliances related to fire protection and escape.	Checking whether the appliances work in good order is to be carried out.
4 Fire detection system and fire alarm system including manually operated call points.	Checking whether the systems work in good order (including proper operation of malfunction indicator) is to be made.

5 Fire pumps (including emergency fire pumps) piping, hydrants, hoses, nozzles etc.	Performance test of the firefighting system composed of fire pump, hydrants, etc, is to be carried out. For ships with fire pumps in periodically unattended machinery spaces, and operation test of the remote control system or automatic operation system of one pump is to be carried out.
6 Fixed deck foam system	Checking whether the system works in good order is to be carried out by delivering water.
7 Ventilation system	Checking whether the system works in good order is to be carried out.
8 Stability Computer	A performance test is to be carried out on computers for stability calculation that are installed as a supplement to the stability information booklet on board ships contracted for construction on or after 1 July 2005.
9 Water level detection and alarm system.	Checking whether the system work in order is to be carried made at random.
10 Dewatering arrangements	Checking whether the systems work in order is to be made
11 Bow doors, inner doors, side shell doors and stern doors	Checking whether the appliances work in good order is to be carried out. Hose test (when deemed necessary by the Surveyor).

Table 3.4(1) Internal Examinations of Spaces and Tanks

Items	Examination
Requirements for cargo ships except when specified otherwise.	
1 Engine room and boiler room.	An internal examination in to be carried out.
2 Ballast tanks	For ships over 5 *years* of age, an internal examination of the tank(s), of which an internal examination is required as a consequence of the last intermediate Survey or special survey, is to be carried out.
Requirements for Tankers, Ships Carrying Dangerous Chemical in bulk and Ships Carrying Liquefied Gases in bulk.	
1 Engine room and boiler room	An internal examination in to be carried out.
2 Cargo pump rooms, other pump rooms adjacent to cargo tanks, cargo compressor rooms and cargo pipe tunnels.	An internal examination in to be carried out after the areas are thoroughly cleaned out and free of gas. Attention in to be paid to the sealing arrangements of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of pumps and compressors.
3 Ballast tanks	For oil tankers, ships carrying dangerous chemicals in bulk with integral tanks and ships carrying liquefied gases in bulk over 5 *years* of age, an internal examination of the tank(s), of which an internal examination is

	required as a consequence of last intermediate Survey or special survey, is to be carried out. For oil tankers other than double hull oil tankers, as defined in **1.3.1(12)** over 5 years of age, an internal examination of all tanks adjacent (i.e. with a common plane boundary) to a tank with heating coils is to be carried out. However where coating was found to be in good condition at the previous Intermediate Survey or Special Survey, that tank may be specially considered at the discretion of the Surveyor. For double hull oil tankers as defined in **1.3.1(12)** over 5 *years* of age, an internal examination of all tanks adjacent (i.e. with a common plane boundary) to a tank with heating coils is to be carried out. However where coating was found to be in good condition at the previous Intermediate Survey or Special survey, that tank may be specially considered at the discretion of the Surveyor.
Requirements for Bulk Carriers other than Double Skin Bulk Carriers*1	
1 Engine room and boiler room	An internal examination in to be carried out.
2 Ballast tanks	For bulk carriers over 5 *years* of age, an internal examination of the tank(s) of which an internal examination is required as a consequence of the last Intermediate Survey or Special Survey is to be carried out.
3 Cargo holds	For bulk carriers over 10 *years* of age, an internal examination of all cargo holds is to be carried out.

Table 3.4(2) Internal Examinations of Spaces and Tanks

Items	Examination
Requirements for Double Skin Bulk Carries	
1 Engine room and boiler room	An internal examination in to be carried out.
2 Ballast tanks	For bulk carriers over 5 *years* of age, an internal examination of the tank(s) of which an internal examination is required as a consequence of the last Intermediate Survey or Special Survey, is to be carried out.
3 Cargo holds	For bulk carriers over 10 *years* and up to 15 *years* of age, an internal examination of two selected cargo holds is to be carried out. For bulk carriers over 15 *years* of age, an internal examination of all cargo holds is to be carried out
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Engine room and boiler room	An internal examination in to be carried out.

Note:

2 Ballast tanks	For general dry cargo ships over 5 *years* of age, an internal examination of the tank(s) of which an internal examination is required as a consequence of the last Intermediate Survey or Special Survey, is to be carried out.
3 Cargo holds	For general dry cargo ships carrying timber cargoes 5 *years* of age and up to *10 years* of age, an internal examination of all cargo holds is to be carried out to check the condition of lower part of hold frames, lower brackets and lower part of transverse bulkheads. For general dry cargo ships over 10 *years* and up to 15 *years* of age, an internal examination of one forward and one after cargo hold (all cargo holds for ships carrying timber cargoes) and their associated tween deck spaces is to be carried out. For general dry cargo ships over 15 *years* of age, an internal examination of all cargo holds and their associated tween deck spaces is to be carried out.

*1: 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 for Double Skin Bulk Carriers are to apply to cargo holds of double side skin and associated wing spaces.

Table 3.5 Close-up Surveys

Items	Examinations
Requirements for Cargo Ships except when specified otherwise	
1 Bow doors, inner doors, side shell doors and stern doors	Close-up surveys of securing, supporting and locking devices, together with welded parts, are to be carried out.
Requirements for Bulk Carriers other than Double Skin Bulk Carriers*1	
1 Hatch covers and hatch coaming	Close-up surveys of hatch cover plating and coaming plating and their stiffener is to be carried out.

2 Structural members in cargo holds	For bulk carriers over 10 *years* but not more than 15 *years* of age, a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) is to be carried out, to establish the condition of the lower region of the side frames including approximately the lower one third length of the frames at side shell and side frame end attachment and the adjacent shell plating in the forward cargo hold. For bulk carriers over 15 *years* of age, a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) is to be carried out, to establish the condition of the lower region of the side frames including approximately the lower one third length of the frames at side shell and side frame end attachment and the adjacent shell plating in the forward cargo hold and other selected cargo hold. 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 frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) of all remaining cargo holds.
Requirements for Double Skin Bulk Carriers	
1 Hatch covers and hatch coamings	Close-up survey of hatch cover plating and hatch coaming plating and their stiffeners is to be carried out.
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Hatch covers and hatch coamings	Close-up survey of hatch cover plating and hatch coaming plating and stiffeners is to be carried out.
2 Cargo hold frames	For general dry cargo ships carrying timber cargoes 5 *years* and up to 15 *years* of age, the extent of survey is to be increased to the satisfaction of the Surveyor where deemed necessary by the Surveyor as a consequence of the survey carried out in accordance with **Table 3.4**. For general dry cargo ships over 15 *years* of age, a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) is to be carried out, to establish the condition of the lower region of the shell frames including approximately the lower one third length of the frames at side shell and side frame end attachment and the adjacent shell plating in the forward cargo hold the forward cargo hold in the case of deck spaces and other selected cargo hold one other selected cargo hold in the case of tween deck spaces. 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 associates 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).

Note:

*1: 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 for Double Skin Bulk Carriers are to apply to cargo holds of double side skin and associated wing spaces.

Table 3.6 Thickness Measurements

Items	Note
Requirements for Cargo Ships except when specified otherwise	
1 Structural members in ballast tanks	When extensive corrosion is found in the examination specified in **Table 3.4** which is required for ship over 5 *years* of age, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-2**
2 Bow doors, inner doors, side shell doors and stern doors	When deemed necessary by the Surveyor as a consequence of the examination specified in **Table 3.2**, Thickness measurements are to be carried out.

Requirements for Tankers, Ships Carrying Dangerous Chemicals in bulk and Ships Carrying Liquefied Gases in bulk	
1 Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in cargo pump rooms and cargo compressor rooms and on weather decks.	When deemed necessary by the Surveyor as a consequence of the examination specified in **Table 3.2**, thickness measurements are to be carried out.
2 Structural members in ballast tanks	When extensive corrosion is found in the examination of ballast tanks specified in **Table 3.4** which is required for oil tankers, ships carrying dangerous chemical in bulk with integral tanks and ships carrying liquefied gases in bulk over 5 *years* of age, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-3 or -4**
Requirements for Bulk Carriers	
1 Structural members in ballast tanks	When extensive corrosion is found in the examination of ballast tanks specified in **Table 3.4** which is required for ships over 5 *years* of age, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-5**
2 Hatch covers and hatch ballast tanks	When deemed necessary by the Surveyor as a consequence of the internal examination required in **Table 3.4** or the close-up survey required in **Table 3.5**, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-5**
3 Structural members in cargo holds	
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Structural members in ballast tanks	When extensive corrosion is found in the examination of ballast tanks specified in **Table 3.4** which is required for general dry cargo ships over 5 *years* of age, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-6**
2 Hatch covers and hatch ballast tanks	When deemed necessary by the Surveyor as a consequence of the close-up survey required in Table **3.5**, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-6**

3 Structural members in cargo holds	For general dry cargo ships over 10 years of age, When deemed necessary by the Surveyor as a consequence of the internal examination required in **Table 3.4** and the close-up required in Table **3.5**, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provisions of **5.2.6-6**

Table 3.7 Performance Tests at Annual Surveys

Items	Examinations
1 Shut-off devices for oil tanks	Operation tests for the remote shut-off devices for fuel oil tanks and lubricating oil tanks are to be carried out.
2 Fuel oil pumps, cargo pumps , ventilating fans and boiler draught fans	Operation tests for emergency stopping means are to be carried out.
3 Emergency electrical power source	Operation tests for emergency source power of electrical power and its associated equipment are to be carried out in order to ascertain that the whole system is in good working order. Automatically operated equipment is to be tested in the automatic mode.
4 Communications systems	Operation tests for the means of communication between the navigation bridge and the machinery control position and the steering gear compartment are to be carried out.

5 Steering gears	Performance tests specified in the following (a) to (e) are to be carried out for the main and auxiliary steering gears including their associated equipment and control system; (a) Operation test for the power units including changeover from one to another (b) Operation test for automatic and remote isolation of the power actuating systems specified in **15.6 Part 7** (c) Test for supply of the alternative source of power specified in **15.2 Part 7** (d) Operation test for the control system including the changeover system (e) Operation test for the alarm devices, rudder angle indicators and running indicators of power units specified in **Part 7**
6 Bilge systems	Operation tests for the valves (including ones for emergency use) cocks, strainers, pumps, reach-rods and level alarms of the bilge systems are to be carried out.
7 Safety devices	Operation tests for the safety devices, etc. specified in the following (a) to (d) are to be carried out. However, the tests may be omitted at the Surveyor´s discretion based on the general examination, reports of working conditions at sea and inspection records taken by the ship´s crew.
(a) Main propulsion machinery and auxiliary machinery	Operations tests for the following safety/alarm devices on prime movers of main propulsion machinery; electric generators; auxiliary machinery essential for propulsion; and auxiliary machinery for manoeuvering and crew safety are to be carried out. Where deemed necessary by the Surveyor, the maintenance records of the cooling water and lubricating oil are required to be presented for review. (i) Overspeed protective devices (ii) Automatic Shut-off and alarm devices in case of loss or low pressure of the lubricating oil. (iii) Automatic Shut-off devices in case of abnormally low pressure of the main condenser vacuum for main steam turbines.
(b) Boilers, thermal oil heaters and incinerators	Operation tests for the safety devices, alarm devices and pressure indicators specified in **Chapter 9, Part 7** are to be carried out. Calibration records for the pressure indicators are to be ascertained and the relieving gears of the safety valves are to be examined and tested to verify satisfactory operation. However, the relief valves provided on the exhaust gas economizers are to be tested by the Chief Engineer at sea prior to the Annual Survey within the period specified in **1.1.3-1(1).** This test is to be recorded in the logbook for review by the attending surveyor. Where deemed necessary by Surveyor, the control records of the boiler water and thermal heater oil are required to be presented for review.
(c) Monitoring devices	Operation test for pressure indicators, thermometers, ammeters, voltmeters and revolution meters are to be carried out.
(d) Automatic control devices or remote control devices	Operation tests for automatic and remote control devices of auxiliary machinery essential for propulsion, manoeuvering, and crew safety are to be carried out.

Table 3.8 Test

Items	Examinations
1 Cargo pumps, bilge pumps, ballast pumps, stripping pumps and ventilators	Operation tests for the remote control systems and shut-off devices of the pumps installed in cargo pump rooms are to be carried out.
2 Bilge systems	Operation tests of bilge systems installed in cargo pump rooms are to be carried out.
3 Level indicators	Operation tests of level indicators used in cargo tanks are to be carried out.
4 Pressure indicators	Operation tests of pressure indicators installed in cargo discharge lines are to be carried out.

5 Inert gas systems	Inert gas systems installed in accordance whit **4.5.5, Part 6** are subjected to the following tests. Other inert gas systems are to be examined as deemed appropriate by the Society. (a) Operation tests of the inert gas blowers and scrubber room ventilation system (b) Function tests of the water seals general examinations of the non-return valves (c) Operation tests of the remotely operated or automatically controlled valves (d) Operation test of the interlocking system between the soot blowers and the shut-off valves on gas supply line (e) Operation tests of the measuring devices, alarm devices and safety devices specified in **35.2.6** and **35.2.8** through **35.2.10, Part 6**
6 Gauging, detecting and alarming devices	Operation tests for the following are to be carried out. Where tests under actual conditions are difficult, simulation tests or other suitable means may be used to confirm functionality. (a) Fixed and portable gas detecting instruments and associated alarms (b) Gauging devices for oxygen density

Table 3.9(1) Special Requirements for Ships Carrying Liquefied Gases in Bulk

Items	Examinations
1 Cargo containment system	General condition of cargo tanks, secondary barriers and their insulation; and sealing arrangement for cargo tanks or tank covers penetrating decks is to be examined as far as accessible. At the first Annual Survey after delivery, examinations specified in 1(a), (b) and 2 of **Table 5.27** and an examination of the general condition of cargo tank foundations are to be carried out. However, these examinations may be dispensed with in accordance with the provisions specified otherwise by the Society.

2 Ventilating system for hold spaces and cargo containment system	Pressure/Vacuum valves, safety systems, and their associated flame screens for cargo tanks, interbarrier spaces, and hold spaces, as well as the means for draining the vent pipes are to be examined generally as far as accessible. It is to be confirmed that the pressure relief valves for the cargo tanks are sealed and the relevant certificate for their opening/closing pressure is provided on board.
3 Cargo handling system	The general condition of the equipment shown in **(a)** to **(c)** below is to be examined during operation as far as practical. General examination and performance test of emergency shut-off devices for stopping cargo transfer are to be carried out. (a) Machinery for cargo handling including cargo heat exchangers, vaporizers, pumps and compressors. (b) Piping and its insulation for cargo handling system as far as accessible. (c) Automatic and manual stopping devices for cargo pumps and compressors
4 Gauging, detecting, safety, and alarming devices	General examinations and performance tests of the following (a) through (f) are to be carried out. Where tests under actual conditions are difficult, simulation tests or other suitable means may be used to confirm functionality. (a) Liquid level gauges, high level alarms and valves associated with shut-off system (b) Temperature indication equipment and associated alarms (c) Pressure gauges and associated alarms for cargo tanks, interbarrier spaces and hold spaces (d) Fixed and portable gas detecting instruments and associated alarms (e) Gauging devices for oxygen density (f) Safety devices of the arrangements for the use of cargo as fuel
5 Environmental control system	General examinations of the following (a) through (c) are to be carried out. (a) Gas free and purging systems and gas collecting devices for cargo tanks. (b) Equipment for inerting, drying, and compensating normal gas losses; and their drying agents (c) Pressure control system for associated inert gas system component, means for preventing backflow of gases and monitoring system
6 Fire extinguishing arrangement	General condition of additional fireman´s outfits for flammable cargoes, fire fighting systems for gas dangerous closed spaces and alarming devices for emergency escape is to be examined.

7 Personnel protection	General examination of the equipment shown in (a) through (d) is to be carried out in addition to performance tests of decontamination shower and eye wash. (a) Protection equipment (b) Safety equipment (c) Stretcher and medical first-aid equipment (d) The following equipment if required by the provisions of *IGC Code-IMO*: i) respiratory protection for emergency scape purpose ii) decontamination showers and eye wash iii) shelter in emergency

Table 3.9(2) Special Requirements for Ships Carrying Liquefied Gases in Bulk

Items	Examinations
8 Miscellaneous	The general condition of the equipment shown in (a) through (j) is to be examined. The contents of items (k) and (l) are to be checked and confirmation that they are kept on board is to be made. (a)Facilities associated with damage stability requirements such as cross flooding equipment and watertight doors, as far as accessible. Where it is difficult to carry out a general examination of cross flooding equipment, alternative examinations considered appropriate by the Society may be carried out instead. (b) Closing devices of windows, doors and other openings of the wheelhouse, superstructures, and deckhouses that are required to be gas/vapor-tight; and the arrangements for the air locks.

	(c) Venting systems including their spare fans or impellers for enclosed spaces and compartments in cargo area (d) Fixed or portable trays or insulation that protects the deck located beneath the cargo hose connection against cargo leakage. (e) Gas-tight bulkhead penetrations including gas-tight shaft sealings, as far as accessible. (f) Heating arrangements of structural hull steel, as far as accessible. (g) Type approved cargo hoses. (h) Earting between hull structures and cargo pipes as far as accessible. (i) Bow and stern loading and unloading arrangements and their related installations, emergency muster station and other equipment required for special cargoes. (j) Electrical installations in gas dangerous spaces or zones. (k) Cargo log book, operational records and manuals related to cargo containment system and cargo handling system.

Table 3.10 Special Requirements for Ships Carrying Dangerous Chemicals in bulk

Items	Examinations

1 Weather deck	The general condition of the following equipment shown in (a) through (d) is to be examined. For the equipment shown in (a), operation tests are to be carried out on each. (a) Sampling arrangements for cargoes from heating and cooling lines. (b) Closing devices of windows, doors and other opening of the wheelhouse, superstructures, and deckhouses that are required to be gas/vapor-tight. (c) Pump discharge pressure gauges provided outside the pump rooms. (d) Insulation of piping
2 Cargo pump room and cargo handling spaces	The general conditions of the following equipment shown in (a) through (c) are to be examined. (a) Electrical and mechanical devices for remotely controlling cargo pumps and bilge system; and remote shut-off system (b) Personnel rescue arrangements in cargo pump room (c) Equipment for cargo separation (d) Ventilating system including spare fans or impellers for enclosed spaces and compartments in cargo area (e) System for flowback to land facilities of cargo liquid and its slop and vapour
3 Environmental control system for cargo containments and surrounding spaces	The general condition of the following equipment shown in (a) through (b) is to be examined. (a) Equipment for inerting, padding, drying, and compensating normal gas losses; and their drying agents. (b) Monitoring system for environmental control for the vapor spaces in cargo containments and void spaces surrounding such cargo containments
4 Gauging, gas detecting and alarming devices	General examinations and performance tests of the following (a) through (d) are to be carried out. Where tests under actual conditions are difficult, simulation tests or other suitable means may be used to confirm functionality (a) Liquid level gauges, high level alarms and valves associated with overflow control (b) Gauging devices for liquid level, temperature and pressure of cargo containment system and the associated alarming devices (c) Fixed and portable gas detecting instruments and the associate alarming devices (d) Gauging devices for oxygen density
5 Fire extinguishing arrangement	The general condition of additional fireman´s outfits for flammable cargoes, fire fighting systems for gas dangerous closed spaces and alarming devices for emergency escape is to be examined.
6 Personnel protection	General examinations of the following equipment shown (a) through (e) is to be carried out. Performance tests of decontamination shower and eye wash are to be carried out. (a) Protection equipment (b) Safety equipment

	(c) Stretcher and medical first-aid equipment (d) Decontamination showers and an eye wash (e) Where deemed necessary, respiratory protection for emergency escape purpose
7 Miscellaneous	The general condition of the equipment shown in (a) through (j) is to be examined. The contents of items (k) and (l) are to be checked and confirmation that they are kept on board is to be made. (a) Facilities associated with damage stability requirements such as cross flooding equipment and watertight doors, as far as accessible. Where it is difficult to carry out a general examination of cross flooding equipment, alternative examinations considered appropriate by the Society may be carried out instead. (b) Cargo sample storage arrangements (c) Bow and stern loading/unloading arrangement and their related installation (d) Fixed or portable trays or insulation that protects the deck located beneath the cargo hose connection against cargo leakage. (e) Identification marks of pipe lines including pumps and valves (f) Cargo tank ventilating system and means for draining its pipes (g) Type approved cargo hoses (h) Special arrangements in accordance with the special requirements for certain cargoes (i) Heating and cooling arrangement for cargoes (j) Electrical installations in gas dangerous spaces or zones (k) Cargo log book, operational records and manuals related to cargo containment system and cargo handling system

Chapter 4 INTERMEDIATE SURVEYS

4.1 General

4.1.1 Surveys Equivalent to Special Surveys

1. Surveys equivalent to Special Surveys may be required when considered necessary by the Society, based on the service and repair history of the ship or damages history of similar ship types or ships with similar tanks and spaces.

2. Intermediate Surveys for bulk carriers, oil tankers, and ships carrying dangerous chemicals in bulk over 10 years of age and general dry cargo ships of not less than 500 gross *tonnage* over 15 years of age are to be carried out to the extent of the previous Special Survey. That is, the surveys specified in **4.2.2, 4.2.4, 4.2.5** and **4.2.6** are replaced by **5.2.2, 5.2.4, 5.2.5** and **5.2.6** respectively; and the surveys specified in **5.2.3-2(3) and** Docking Surveys (except item 7 specified in **Table 6.1**) are to be carried out. However, internal examinations of fuel oil, lube oil and fresh water tanks; examinations (both external and internal) of automatic air pipe heads installed on the exposed deck; and thickness measurements of each bottom plate within the cargo length area including lower turn of bilge for general dry cargo ships of not less than 500 gross tonnage over 15 years of age do not need to be carried out.

3. Where the Intermediate Survey is commenced in accordance with the requirements in **1.1.3-1(2)(b),** the thickness measurement required in **5.2.6** is to be carried out at the commencement of the Survey in order to facilitate planning repairs, as far as practicable. Where the Intermediate Survey is commenced at the time of a Surveys at, a minimum the examinations required in **Chapter 3** are to be carried out.

4. Where the Intermediate Survey is commenced at the second Annual Survey and is completed at the third Annual Survey in accordance with the requirements in **1.1.3-1(2)(b),** a minimum the examinations required in **Chapter 3** are to be carried out at the completion of the Intermediate Survey. However, the Surveyor may, based upon the above results, require examinations already carried out be conducted again when deemed necessary.

4.1.2 Survey for Combination carriers

At Intermediate Surveys for combination carriers such as ore/oil carriers and ore/bulk/oil carriers, the surveys are to be carried out in accordance with the relevant requirements in this Chapter, considering the ship's equipment, structural configuration and past operational experience.

4.2 Intermediate Surveys for Hull, Equipment, Fire extinction and Fittings

4.2.1 Examination of Plans and Documents

At Intermediate Surveys, the management conditions of plans and documents specified in **3.2.1** are to be examined.

4.2.2 General Examination

At Intermediate Surveys, examinations of hull, equipment, fire-extinction and fittings specified in **3.2.2** are to be carried out. In addition, conditions of spare parts for fire-extinguishing systems are to be generally examined.

4.2.3 Performance Test

At Intermediate Surveys, performance tests listed in **Table 4.1** are to be carried out.

4.2.4 Internal Examinations of Spaces and Tanks

At Intermediate Surveys, internal examinations of the areas listed in **Table 4.2** and suspect areas identified in the previous survey are to be carried out. However, assessment of the coating condition of ballast tanks for oil tankers and ships carrying dangerous chemicals in bulk is as defined by the Society.

4.2.5 Close-up Surveys

At Intermediate Surveys, close-up surveys listed in **Table 4.3** are to be carried out.

4.2.6 Thickness Measurements

At Intermediate Surveys, thickness measurements of the areas listed in **Table 4.4** and suspect areas identified in the previous survey are to be carried out. As to the gauging equipment and thickness measurement report, the provisions of **5.2.6-1** are to be applied correspondingly as well.

4.2.7 Pressure Test

At Intermediate Surveys for oil tankers and ships carrying dangerous chemicals in bulk, a pressure test for piping systems is to be carried out when deemed necessary by the Surveyor as a consequence of the general examination required in **4.2.2.**

4.3 Intermediate Surveys for Machinery

4.3.1 General Examinations

At Intermediate Surveys for Machinery, in addition to the general examinations specified in **3.3.1,** the examinations specified in **Table 4.5** are to be carried out. For each ship adopting the preventive maintenance system for propulsion shafting systems in accordance with the requirements of **8.1.3**, a general examination of the shafting systems and a review of all their condition monitoring data available on board the ship are to be carried out in order to ascertain that the systems are well maintained.

4.3.2 Performance Tests

At Intermediate Surveys for Machinery, the performance tests specified in **3.3.2** are to be carried out.

4.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

4.4.1 General

In addition to the requirements of 4.2 and 4.3, requirements of 4.4 apply to Intermediate Surveys for ships carrying liquefied gases in bulk. Examinations of inerter cargo tanks or spaces may be omitted at the discretion of the Surveyor.

4.4.2 Examinations

At Intermediate Surveys for ships carrying liquefied gases in bulk, examinations of spaces, structures and equipment specified in Table 4.6 are to be carried out in addition to examinations required in 3.4.2. The survey may be expanded to include performance tests, operation tests, open-up examinations, etc. where deemed necessary by the Surveyor.

4.5 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

4.5.1 General

In addition to the requirements of 4.2 and 4.3, requirements of 4.5 apply to Intermediate Surveys of ships carrying dangerous chemicals in bulk.

4.5.2 Examinations

At Intermediate Surveys of ships carrying dangerous chemicals in bulk, examinations of spaces, structures and equipment specified in Table 4.7 are to be carried out in addition to examinations required in 3.5.2. The survey may be expanded to include performance tests, operation tests, open-up examinations, etc. where deemed necessary by the Surveyor.

Table 4.1 PerformanceTest

Items	Tests
1 Equipment or installations of items in **Table 3.3** (except item 2)	• Tests for each item specified in table 3.3 are to be carried out.

2 Doors on watertight bulkheads and closing appliances on superstructure end bulkheads, deckhouses or companions protecting hatchways giving access to spaces below freeboard deck	• Confirmation that the doors and closing appliances work in order is to be made. • Hose tests listed in **Table 2.1** or equivalent tests are to be carried out. Such tests may be dispensed with at the discretion of the Surveyor.
3 Drainage, mooring and anchoring arrangements and their accessories	• Confirmation that the arrangements work in order is to be made. This check may be dispensed with at the discretion of the Surveyor.
4 Fixed dry-chemical powder fire fighting system	• Confirmation that the piping is maintained in good condition is made by delivering air through the pipes. Confirmation that monitors and hoses, and the remote control system and related automatic valves work in order is to be made. • Confirmation of quantity of starting or pressuring gases is to be made.
5 Water spray system	• Checking whether the system works in order is to be made by delivering water through the system. Checking of quantity of delivered water may be dispensed with.
6 Carbon dioxide extinguishing medium, halon extinguishing medium and dry powder extinguishing medium	• Confirmation of quantity of media is to be made.
7 Fixed carbon dioxide fire fighting system and fixed halon fire fighting system	• Confirmation that piping is maintained in good condition is made by delivering air through the pipes. • Confirmation that system alarm works in order is to be made.
8 Fixed foam fire fighting system and fixed high expansion foam fire fighting system	• Confirmation that piping is maintained in good condition is to be carried out by delivering water through the pipes.
9 Fixed pressure water spraying fire fighting system	• Confirmation that the system works in order is to be made by delivering water through the system. • Confirmation that the system pump works in order is to be made.
10 Automatic sprinkler system	• Confirmation that the delivery alarm and pump work in order is to be made while fire detecting system is in operation.
11 Fixed Local Application Fire-fighting Systems	• Confirmation that the piping is to be made by delivering air through the pipes. • Confirmation that the system alarm works in order is to be made.

	• Confirmation that the feed water pump and starting valve works in order is to be made.
12 Closing appliances of openings related to fire fighting in way of cargo holds	• Confirmation that closing appliances work in order is to be made
Additional Requirements for Bulk Carriers	
13 Mechanically operated hatch covers	• Confirmation that hatch cover sets within the forward 0.25 L_f and at least one additional set work in good order is to be carried out. The method is to be in a way that ensures all sets on the ship are checked at least once every 5 *years* between special surveys. • Confirmation that all hatch covers work in good order is to be carried out for ships over 10 *years* of age.
14 Weathertight hatch covers	• Hose tests listed in **Table 2.1** or equivalent, for all hatch covers for ships over 10 *years* of age.
15 Water level detection and alarm systems	• Confirmation that the systems work in order is to be made for ships over 10 *years* of age.

Table 4.2(1) Internal Examinations of Spaces and Tanks

Items	Examinations
1 Engine room and boiler room	• An internal examination is to be carried out on all aspects.
2 Ballast tanks	• For ships over 5 *years* and up to 10 *years* of age, an internal examination of representative ballast tanks is to be carried out. Where poor coating condition, corrosion or other defects are found in a ballast tank or where a protective coating has not been applied from the time of construction, the examination is to be extended to other ballast tanks of the same type. • For ships over 10 *years* of age, an internal examination of all ballast tanks is to be carried out. • If such examinations reveal no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains effective. • For ballast tanks where a protective coating is found in poor condition, and it is not renewed or where a protective coating has not been applied, excluding double bottom tanks, an internal examination is to be carried out at annual intervals. For double bottom ballast tanks in this condition, where considered necessary by the Surveyor, an internal examination is to be carried out at annual intervals.
3 Cargo holds	• For cargo ships over 10 *years* of age, excluding ships solely carrying dry cargoes, an internal examination of selected cargo holds is to be carried out. For ships over 15 *years* of age, an internal examination of one forward cargo hold and one after cargo hold is to be carried out.

Note:

1 “Representative ballast tanks” means ballast tanks which include, at least, fore and aft peak tanks and two deep tanks within the cargo length area.

Table 4.2(2) Internal Examinations of Spaces and Tanks

Items	Examinations
Requirements for Tankers, Ships Carrying Dangerous Chemical in bulk and Ships Carrying Liquefied Gases in Bulk	
1 Engine room and boiler room	• An internal examination is to be carried out on all aspects.
2 Cargo pump rooms, other pump rooms adjacent to cargo tanks, cargo compressor rooms and cargo pipe tunnels.	• An internal examination is to be carried out after thoroughly cleaned out and gas freed. Attention is to be paid to the sealing arrangement of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of pump and compressor.
3 Ballast tanks	For Oil Tankers and Ships Carrying Dangerous Chemical in bulk with integral tanks: • For oil tankers and ships carrying dangerous chemical in bulk with integral tanks over 5 *years* of age, an internal examination of the tank(s), of which an internal examination is required as a consequence of the last Intermediate Survey or Special Survey, is to be carried out. • For oil tankers and ships carrying dangerous chemical in bulk over 5 *years* and up to 10 *years* of age, an internal examination of representative ballast tanks is to be carried out. For oil tankers except Double hull oil tankers, an internal examination of ballast tanks is to be carried out. • If such examinations reveal no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains effective. • Where a poor coating condition, corrosion or other defects are found in a ballast tank or where a protective coating has not been applied from the time of construction, the examination is to be extended to other ballast tanks of the same type. • As result of internal examinations, ballast tanks with conditions shown in (a) and (b) require an internal examination to be carried out at annual intervals. (a) The protective coating is found to be in less than good condition and it is not repaired to the satisfaction of the Surveyor. (b) The protective coating has not been applied from the time of construction or only the soft coating has been applied (the examination is to be extended to other ballast tanks of the same type). For Ships Carrying Liquefied Gases in bulk: • For ships over 5 *years* and up to 10 *years* of age, an internal examination of representative ballast tanks is to be carried out.

	• For ships over 10 years of age, an internal examination of ballast tanks is to be carried out. • If such examinations reveal no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains effective. • For ballast tanks where a protective coating is found in poor condition, and it is not renewed or where a protective coating has not been applied, excluding double bottom tanks, an internal examination is to be carried out at annual intervals. For double bottom ballast tanks with the condition as specified, where considered necessary by the Surveyor, an internal examination is to be carried out at annual intervals.

Note:

1 Representative ballast tanks means ballast tanks which include, at least, fore and aft peak tanks and two (for double hull oil tankers, three) deep tanks within the cargo length area.

Table 4.2(3) Internal Examinations of Spaces and Tanks

Items	Examinations
Requirements for Bulk Carriers	
1 Engine room and boiler room	• An internal examination is to be carried out on all aspects
2 Ballast tanks	• For bulk carriers over 5 *years* and up to 10 *years* of age, an internal examination of representative ballast tanks and combined cargo/ballast tanks, if any, is to be carried out. Where a poor coating condition, corrosion or other defects are found in a ballast tank or where a protective coating has not been applied from the time of construction, the examination is to be extended to other ballast tanks of the same type. • If such examinations reveal no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains effective. • For ballast tanks where a protective coating is found in poor condition, and it is not renewed or where a protective coating has not been applied, excluding double bottom tanks, an internal examination is to be carried out at annual intervals. For double bottom ballast tanks with the condition as specified, where considered necessary by the Surveyor, an internal examination is to be carried out at annual intervals.
3 Cargo holds	• For bulk carriers over 5 years of age, an internal examination of all cargo holds is to be carried out
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Engine room and boiler room	• An internal examination is to be carried out on all aspects
2 Ballast tanks	• Same as those for cargo ships
3 Cargo holds	• For general dry cargo ships over 5 *years* and up to 10 *years* of age, an internal examination of one forward and one after cargo hold (all cargo holds for ships carrying timber cargoes) and their associated tween deck spaces is to be carried out. • For general dry cargo ships over 10 *years* of age, an internal examination of all cargo holds and their associated tween deck spaces is to be carried out.

Note:
1 The wording representative ballast tanks means ballast tanks which include, at least, fore and aft peak tanks and two (for double skin bulk carriers, three) deep tanks within the cargo length area.

Table 4.3(1) Close-up Surveys

Items	Examinations
Requirements for cargo Ships except when specified otherwise	
1 Bow doors, inner doors, side shell doors and stern doors	• Close-up surveys of securing, supporting and locking devices, together with welded parts, are to be carried out.
Requirement for Ships Carrying Liquefied Gases in bulk	
1 Ballast tanks	• For ships over 10 *years* but not more than 15 *years* of age, close-up surveys of the following portions are to be carried out: (1) All web frames*[1] and both transverse bulkheads*[2] in a representative ballast tank (2) The upper part of one web frame and one transverse bulkhead*[2] in another representative ballast tank. • For ship over 15 years of age, close- up surveys of all web frames*[1] and both transverse bulkheads*[2] in two representative ballast tank are to be carried out. • Notwithstanding the above, for ships having independent tanks of type *C*, with a midship section similar to that of general cargo ship, the extent of closed-up survey may be specially considered at the discretion of the Surveyor.
Requirements for Bulk Carriers other than Double Skin Bulk Carriers*[3]	
1 Hatch covers and hatch coamings	• A close-up survey of all hatch cover plating and all hatch coaming plating and their stiffeners is to be carried out.
2 Structural members in cargo holds .1 hold frames including their upper and lower and attachments, adjacent shell plating	• For ships over 5 *years* of age, a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) is to be carried out, to establish the condition of shell frames including their upper and lower and attachments and the adjacent shell plating in the forward cargo hold and other selected cargo hold. Where considered necessary by the Surveyor as a result of the internal examination and close-up survey, the survey is to be extended to include a close-up survey of all of the frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent (i.e. a minimum of 25% of the frames) of all remaining cargo holds.
.2 Transverse bulkheads	• For ships over 5 years of age, close-up survey is to be carried out establish the condition of transverse bulkheads in the forward cargo hold one other selected cargo hold.
.3 Other structural members	• Where considered necessary by the Surveyor as a result of the internal examination required in **Table 4.2**, a close-up survey is to be carried out.
Requirements for Double Skin Bulk Carriers	
1 Hatch covers and hatch coaming	• A close-up survey of all hatch cover plating and all hatch coaming plating and their stiffeners is to be carried out.
2 Structural members in cargo holds	• Where considered necessary by the Surveyor as a result of the internal examination required in **Table 4.2**, a close-up survey is to be carried out.

Notes:

*1: Including structural members adjacent to cross ties and/or transverse web frame rings, such as shell plating, longitudinal bulkheads, longitudinal stiffeners, brackets

*2: Including vertical and horizontal girders and adjacent structural members, and adjacent longitudinal bulkhead structure

*3: 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 for Double Skin Bulk Carriers are to apply to cargo holds of double side skin and associated wing spaces.

Table 4.3(2) Close-up Surveys

Items	Examinations
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Hatch covers and hatch coamings 2 Structural members in cargo holds .1 Lower part of shell frames and their lower end brackets	• A close-up survey of hatch cover plating and hatch coaming plating and their stiffeners is to be carried out.
.2 Lower parts of transverse bulkheads	• For ships carrying timber cargoes over 5 years of age, a close- up survey of structures listed in the left column is to be carried out in all cargo holds.
.3 Lower parts (located on inner bottom plating) of pipes that pass through cargo holds such as air pipes, sounding pipes, etc.	

Notes:

*1: Including structural members adjacent to cross ties and/or transverse web frame rings, such as shell plating, longitudinal bulkheads, longitudinal stiffeners, brackets

*2: Including vertical and horizontal girders and adjacent structural members, and adjacent longitudinal bulkhead structure

*3: 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 for Double Skin Bulk Carriers are to apply to cargo holds of double side skin and associated wing spaces.

Table 4.4(1) Thickness measurements

Items	Note
Requirements for Cargo Ships except those specified in the followings	
1 Structural members in ballast tanks	For cargo ships over 5 years of age • Where considered necessary by the Surveyor as a result of the survey specified in **Table 4.2**, thickness measurements are to be carried out at the discretion of the Surveyor, where a poor coating condition, corrosion or other defects are found in ballast tank or where a protective coating has not been applied from the time of construction. • Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provision of **5.2.6-2**
2 Bow doors, inner doors, side shell doors and stern doors	• When deemed necessary be the Surveyor as a consequence of the examination specified in **4.2.2**, thickness measurements are to be carried out.
Requirements for tankers, Ships Carrying Dangerous Chemicals in bulk and Ships carrying Liquefied Gases in bulk	
1 Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in cargo pump rooms and cargo compressor rooms and on weather decks	• When deemed necessary be the Surveyor as a consequence of the examination specified in **4.2.2**, thickness measurements are to be carried out.
2 Structural members in ballast tanks (for ships over 5 years of age)	• Where considered necessary by the Surveyor as a result of the survey specified in **Table 4.2**, thickness measurements are to be carried out at the discretion of the Surveyor, where a poor coating condition, corrosion or other defects are found in ballast tank or where a protective coating has not been applied from the time of construction. • If the results of thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-3 or -4**
3 Structural members in cargo tanks	• For cargo ships over 5 *years* of age (excluding ships carrying liquefied gases in bulk), if the results of thickness measurements specified in **4.2.6** indicate that substantial corrosion in found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-3 or -4**
Requirements for the Bulk Carriers over 5 *years* of age	

1 Structural members in ballast tanks	• Where considered necessary by the Surveyor as a result of the survey specified in **Table 4.2**, thickness measurements are to be carried out at the discretion of the Surveyor, where a poor coating condition, corrosion or other defects are found in ballast tank or where a protective coating has not been applied from the time of construction. • If the results of thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-3 or -4** • In addition to the above, for bulk carriers built under **CSR-B**, identified substantial corrosion areas are to be in accordance with either the following (1) or (2): (1) Be protected by coatings applied in accordance with coating manufacturer requirements and examined annually to confirm said coatings are still in good condition; or, (2) Have thickness measurements taken annually
2 Hatch covers and hatch coamings	• Where considered necessary by the Surveyor as a result of the close-up survey of the bulk carriers specified in **Table 4.3**, thickness measurements are to be carried out at the discretion of the Surveyor. If the results of thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-5**. • In addition to the above, for bulk carriers built under **CSR-B**, identified substantial corrosion areas are to be in accordance with either the following **(1)** or **(2):** (1) Be protected by coatings applied in accordance with coating manufacturer requirements and examined annually to confirm said coatings are still in good condition; or, (2) Have thickness measurements taken annually.
3 Structural members in cargo holds	• Thickness measurements are to be carried out to an extent that determines both general and local corrosion levels at the area subject to close-up survey. • The thickness measurements may be reduced to a degree that is sufficient to confirm the actual average condition of the structure under the coating provided the Surveyor is satisfied by the results of the close-up survey: that there is no structural diminution and the protective coating remains effective. • If the results of thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-5**. • In addition to the above, for bulk carriers built under **CSR-B**, identified substantial corrosion areas are to be in accordance with either the following **(1)** or **(2):** (1) Be protected by coatings applied in accordance with coating manufacturer requirements and examined annually to confirm said coatings are still in good condition; or, (2) Have thickness measurements taken annually.

Table 4.4(2) Thickness measurements

Items	Note
Requirements for General Dry Cargo Ships of not less than 500 *gross tonnage*	
1 Structural members in ballast tanks	• Where considered necessary by the Surveyor as a result of the survey specified in **Table 4.2**, thickness measurements are to be carried out at the discretion of the Surveyor, where a poor coating condition, corrosion or other defects are found in ballast tank or where a protective coating has not been applied from the time of construction. • If the results of thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements are to be increased in accordance with the provision of **5.2.6-6**
2 Hatch covers and hatch coamings	• When deemed necessary be the Surveyor as a consequence of the close-up survey required in **Table 4.3**, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provision of **5.2.6-6**
3 Structural members in cargo holds	1 For ships carrying timber cargoes over 5 *years* of age • The thickness measurements of structural members that were subject to close-up in all cargo holds is to be carried out to the same extent as the previous Special survey. • The thickness measurements may be dispensed with provided the Surveyor is satisfied by the results of the close-up survey: that there is no structural diminution and the protective coating remains effective. 2 For general cargo ships over 10 *years* of age (excluding ships carrying timber cargoes) • When deemed necessary by the Surveyor as a consequence of the examination required in **Table 4.2**, thickness measurements are to be carried out to the satisfaction of the Surveyor. Where substantial corrosion is found, additional thickness measurements are to be carried out according to the provision of **5.2.6-6**

Table 4.5 Additional Requirements at Intermediate Surveys

Items	Examinations
1Refrigerating Machinery	Examination of refrigerant leakage while the machinery is in operation and the general condition of the safety devices are to be carried out.
Requirements of Tankers	
1 Earthing	The earthing between cargo oil tanks/cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures is to be examined as far as accessible.
2 Electrical installations in hazardous areas	(a) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7, Part 8** is to be carried out. In addition, confirmation that the installations are in good condition is to be made by measuring the insulation resistance. However, this measurement may be omitted at the discretion of the Surveyor, if accurate measurement records of the insulation resistance can be verified. (b) Performance test of interlock devices associated with pressurized protected type electrical equipment and electrical equipment installed in pressurized or ventilated areas are to be carried out.

Table 4.6 Special Requirements for Ships Carrying Liquefied Gases in bulk

Items	Examinations
1 Piping of fixed gas detecting instruments	General examination is to be carried out.
2 Cargo tank pressure relief valves with non-metallic membranes	If cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, it is to be confirmed that such non-metallic membranes are maintained in good condition.
3 Electrical installations in hazardous areas	Examination specified in item 2 for tankers of **Table 4.5** is to be carried out.
4 Earthing	The earthing between cargo tanks and/or cargo piping systems (cargo pipes, vent pipes, etc.) and hull structures is to be examined visually as far as accessible.
5 Drainage system for leaked cargo	Performance test of drainage system for leaked cargo in interbarrier spaces and hold spaces is to be carried out.
6 Fire fighting system in enclosed gas dangerous spaces	Fixed piping is to tested by passing air through it. Performance test of alarming devices emergency scape is to be carried out.
7 Personnel Protection	Where air compressors are used with the safety equipment, performance tests of the air compressors are to be carried out.

Table 4.7 Special Requirements for Ships Carrying Dangerous Chemicals in bulk

Items	Examinations
1 Electrical installations in hazardous areas	Examination specified in item 2 for tankers of **Table 4.5** is to be carried out.
2 Earthing	The earthing between cargo tanks and/or cargo piping systems (cargo pipes, vent pipes, etc.) and hull structures is to be examined visually as far as accessible.
4 Fire fighting system in enclosed gas dangerous spaces	Fixed piping is to be tested by passing air through it. Performance test of alarming devices emergency escape is to be carried out.
7 Personnel Protection	Where air compressors are used with the safety equipment, performance tests of the air compressors are to be carried out.

Chapter 5 SPECIAL SURVEYS

5.1 General

5.1.1 Examinations to be Carried out at the Commencement or Completion of Special Surveys

1. Where the Special Survey is commenced in accordance with the requirements in **1.1.3-1(3)(b)** or **(c),** the thickness measurements required in **5.2.6** are to be carried out at the commencement of the Survey if possible in order to facilitate planning repairs. Where the Special Survey is commenced at or prior to the time of the 4th Annual Survey, at a minimum the examinations required in **Chapter 3** are to be carried out.

2. Where the Special Survey is completed in accordance with the requirements in **1.1.3-1(3)(b)** or **(c),** at a minimum the examinations required in are to be carried out at the completion of the Special Survey. However, the Surveyor may, based upon the results, require examinations already carried out be conducted again deemed necessary.

5.1.2 Survey for Combination Carriers

At Special Surveys for combination carriers such as ore/oil carriers and ore/bulk/oil carriers, the surveys are to be carried out in accordance with the relevant requirements in this Chapter, considering the ship's equipment, structural configuration and past operational experience.

5.1.3 Survey for the Postponement of Special Surveys

Where postponement of the Special Survey for a ship is granted in accordance with the requirements in **1.1.5,** the content of the Special Survey is determined based on the original expiry date of the Classification Certificate of the ship.

5.2 Special Surveys for Hull, Equipment, Fire Extinction and Fittings

5.2.1 Examination of Plans and Documents

At Special Surveys, the management conditions of plans and documents specified in **3.2.1** are to be examined.

5.2.2 General Examination

1. At Special Surveys, all bilge and ballast piping systems in addition to hull, equipment, fire-extinction, and fittings specified in **4.2.2** are to be examined carefully. Automatic air pipe heads which are located on the exposed deck as well as ventilators and the closing appliances for machinery and cargo spaces are also to be examined carefully.

2. At Special Surveys for tankers and ships carrying dangerous chemicals in bulk, in addition to **-1**, cargo piping, vent piping, purging piping, gas free piping, inert gas piping and all other piping systems within all

cargo tanks, all ballast tanks and all tanks and spaces bounding cargo tanks such as pump rooms, pipe tunnels, cofferdams, and void spaces and on weather decks are to be examined.

3. At Special Surveys for ships carrying liquefied gases in bulk, in addition to **-1**, cargo piping, vent piping, purging piping, gas free piping, inert gas piping and all other piping systems within all cargo tanks, all ballast tanks and all tanks and spaces bounding cargo tanks such as pump rooms, cargo compressor rooms, pipe tunnels, cofferdams, and void spaces and on weather decks are to be examined.

4. At Special Surveys for bulk carriers and general dry cargo ships of not less than 500 gross tonnage, in addition to **-1**, all piping systems within all cargo holds, all ballast tanks, and all tanks and spaces bounding cargo holds such as pipe tunnels, cofferdams and void spaces, and on the weather deck are to be examined.

5.2.3 Performance Test

1. At Special Surveys, performance tests specified in **4.2.3** are to be carried out. In addition to such performance tests, it is to be confirmed that the loading instrument required in **Chapter 31, Part 2** works in order. Moreover, the performance tests for mooring and anchoring arrangements specified in item 3 of **Table 4.1** may not be omitted.

2. In addition to -1 above, the performance tests and operation tests specified in **(1)** to **(8)** below are to be carried out.

(1) Operation test for all mechanically operated hatch covers

(2) Hose tests listed in **Table 2.1** or equivalent, for all weathertight hatch covers

(3) Performance tests and operation tests for all bilge and ballast piping system

(4) For oil tankers and ships carrying dangerous chemical in bulk, performance tests and operation tests of cargo and ballast piping systems within all cargo tanks, all ballast tanks and all tanks and spaces bounding cargo tanks such as pump rooms, pipe tunnels, cofferdams and void spaces, and on the weather deck.

(5) For ships carrying liquefied gases in bulk, performance test and operation test of cargo and ballast piping systems within all cargo tanks, all ballast tanks and all tanks and spaces bounding cargo tanks such as pump rooms, cargo compressor rooms, pipe tunnels, cofferdams and void spaces, and on weather deck.

(6) For bulk carriers and general dry cargo ships of 500 gross tonnage, performance test and operation test of all piping systems within all cargo holds, all ballast tanks and all tanks and spaces bounding cargo holds such as pipe tunnels, cofferdams, void spaces, and other similar spaces bounding cargo holds, and those on weather decks

(7) Performance tests listed in item 1 of **Table 4.1**, for all water level detection and alarm systems.

(8) Performance test for the means of embarkation and disembarkation, for ships not less than 500 gross tonnage which are engaged on international voyages.

3. Where considered necessary by the Surveyor, an execution of the inclining test and alterations to the stability information may be required.

5.2.4 Internal Examinations of Spaces and Tanks

1. At Special Surveys, examinations of structures and fittings such as piping in tanks and spaces are to be carried out carefully paying due attention to items (1) through (7) below.

(1) Areas sensitive to corrosion (on parts such as structural members, piping, and hatch covers) in cargo holds where cargoes highly corrosive to steel such as logs, salt, coal, and sulphide ore have been loaded

(2) Areas sensitive to deterioration by heat such as plating under boilers

(3) Structurally discontinuous portions such as corners of hatchway openings on deck, openings (including side scuttles), cargo port, etc. on shell

(4) Condition of coating and corrosion prevention system if applied

(5) Condition of striking plates under sounding pipes

(6) Condition of deck covering (e.g. cement)

(7) Locations on which defects such as cracking, buckling, and corrosion have been found in similar ships or similar structures

2. At Special Surveys, internal examinations of tanks or spaces listed in **Table 5.1** are to be carried out paying attention to the items in **-1** above.

3. At Special Surveys for tankers and ships carrying dangerous chemicals in bulk with integral tanks, in addition to **-1** and **-2** above, an internal examination of tanks and spaces listed in **Table 5.2** is to be carried out. Tanks and spaces identified as suspect areas at previous surveys are to be examined. The examination of the coating condition in ballast tanks for oil tankers and ships carrying dangerous chemicals in bulk is to be based on the coating criteria defined by the Society. However, for ships carrying dangerous chemicals in bulk, stainless steel tanks may be exempted from internal examinations where deemed appropriate by the Society.

4. At Special Surveys for ships carrying liquefied gases in bulk, in addition to **-1** and **-2** above, an internal examination of tanks and spaces listed in **Table 5.2** is to be carried out.

5. At Special Surveys for bulk carriers, in addition to **-1** and **-2** above, an internal examination of tanks and spaces listed in **Table 5.3** is to be carried out. Tanks and spaces identified as suspect areas at previous surveys are to be examined.

6. At Special Surveys for general dry cargo ships of not less than 500 gross tonnage, in addition to **-1** and **-2** above; an internal examination of tanks and spaces listed in **Table 5.4** is to be carried out.

5.2.5 Close-up Surveys

1. At Special Surveys, Close-up Surveys are to be carried out for portions **(1)** to **(3)** below:

(1) Lower parts of shell frames, tank side brackets and transverse bulkheads

(2) Lower parts of air pipes and sounding pipes located on top of inner bottom plating

(3) All hatch cover plating, hatch coaming plating, and stiffeners

(4) Securing, supporting and locking devices together with the welded parts of bow doors, inner doors, side shell, doors and stern doors.

2. At Special Surveys for oil tankers and ships carrying dangerous chemical in bulk with integral tanks, in addition to the provision of **-1** above, a Close-up Survey is to be carried out for structural members listed in **Table 5.5-1.**

3. At Special Surveys for ships carrying liquefied gases in bulk, in addition to the provision of **-1** above, a Close-up Survey is to be carried out for structural members and so forth listed in **Table 5.5-2.**

4. At Special Surveys for bulk carriers, in addition to the provision of **-1** above, a Close-up Survey is to be carried out for structural members listed in **Table 5.6-1.** For ore carriers, a Close-up Survey is to be carried out in accordance with the requirements in **Table 5.6-2** instead of **Table 5.6-1.**

5. At Special Surveys for general dry cargo ships of not less than 500 gross tonnage, in addition to the provisions of **-1** above; a Close-up Survey is to be carried out for structural members listed in **Table 5.7**.

5.2.6 Thickness Measurements

1. At Special Surveys, thickness measurements are to be carried out in accordance with **(1)** through **(5)** below.

(1) Thickness measurements are to be carried out using appropriate ultra-sonic gauging machines or other approved means. The Surveyor may request that the accuracy of the equipment be demonstrated.

(2) Thickness measurements are to be carried at or after the time of the 4th Annual Survey by the firm approved by the Society. The surveyor may request to have the measurements taken again to ensure acceptable accuracy.

(3) Additional thickness measurements are to be carried out before the completion of the survey.

(4) A thickness measurement record is to be prepared and submitted to the Society.

(5) Thickness measurements of structures in areas where close-up surveys are required are to be carried out simultaneously with close-up surveys.

2. At Special Surveys, thickness measurements are to be carried out according to **-1** above for structural members listed in **Table 5.8.** Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Table 5.9.**

3. At Special Surveys for oil tankers and ships carrying dangerous chemicals in bulk with integral tanks, notwithstanding the provision of **-2** above, thickness measurements are to be carried out according to **-1** for structural members listed in **Table 5.10-1**, and tanks and spaces identified as suspect areas at previous surveys. Stainless steel hull structure and piping except for clad steel may be exempted from thickness measurements where deemed appropriate by the Society. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Tables 5.11** through **5.14.**

4. At Special Surveys for ships carrying liquefied gases in bulk, notwithstanding to the provision of **-2** above, a thickness measurement is to be carried out for structural members and so forth listed in **Table 5.10-2** according to **-1** above. Where substantial corrosion is found in the results of such thickness measurements, the thickness measurement is to be expanded to all the structural members listed in the **Table 5.9**, of which the sub-title corresponds to substantially corroded members. 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.

5. At Special Surveys for Bulk Carriers, notwithstanding the provision of **-2** above, thickness measurements are to be carried out according to **-1** above for structural members listed in **Table 5.15** and tanks and spaces identified as suspect areas at previous surveys. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Tables 5.16** through **Table 5.20.**

6. At Special Surveys for general dry cargo ships of not less than 500 gross tonnage, notwithstanding the provision of **-2** above, thickness measurements are to be carried out according to **-1** above for structural members listed in **Table 5.21**. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Table 5.9.**

7. The ship's longitudinal strength is to be evaluated by using the thickness of structural members measured in transverse sections specified in **Table 5.8, Table 5.10, Table 5.15** and **Table 5.21.**

5.2.7 Pressure Tests

1. At Special Surveys, a pressure test of tanks is to be carried out according to **(1)** through **(3)** below.

(1) A pressure test is to be carried out under the pressure specified below:

(a) For tanks: the pressure corresponding to the maximum head that can be experienced in service

(b) For piping: the working pressure

(2) A pressure test of tanks may be carried out when the ship is afloat, provided that an internal examination of the bottoms of the tanks has also been carried out while afloat.

(3) At Special Surveys for ships having many water tanks and oil tanks, some of the tanks may be exempted from a pressure test where deemed appropriate by the Surveyor taking into account the ship's present condition, age and interval from the previous test.

2. At Special Surveys for cargo ships, a pressure test is to be carried out according to **-1** above for tanks listed in **Table 5.22**. Any testing of double bottom tanks and other watertight compartments not designed to carry liquids may be omitted, provided that satisfactory internal and/or external examinations are carried out.

3. At Special Surveys for oil tankers and ships carrying dangerous chemicals in bulk with integral tanks, notwithstanding the provisions of **-2** above, a pressure test is to be carried out for tanks listed in **Table 5.23-1**.

4. At Special Surveys for ships carrying liquefied gases in bulk, notwithstanding the provision of **-2** above, a pressure test is to be carried out for tanks listed in **Table 5.23-2.**

5. At Special Surveys for bulk carriers and dry cargo ships of not less than 500 gross tonnage, notwithstanding the provisions of **-2** above, a pressure test is to be carried out according to **-1** above for tanks listed in **Table 5.24.**

5.3 Special Surveys for Machinery

5.3.1 General Examinations

At Special Surveys for Machinery, in addition to the general examination specified in **3.3.1**, the surveys specified in Table **5.25** are to be carried out. For each ship adopting the preventive maintenance system for the propulsion shafting system in accordance with the requirements of **8.1.3**, a general examination of the shafting system and a review of all their condition monitoring data available on board the ship are to be carried out in order to ascertain that the system is well maintained.

5.3.2 Performance Tests and Pressure Tests

At Special Surveys for Machinery, in addition to the performance tests specified in **3.3.2**, the performance tests specified in **Table 5.26** are to be carried out.

5.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

5.4.1 General

In addition to the requirements of **5.2** and **5.3**, the requirements of **5.4** apply to Special Surveys of ships carrying liquefied gases in bulk.

5.4.2 Examinations

At Special Surveys for ships carrying liquefied gases in bulk, examinations specified in **4.4.2** and examinations of spaces, structures and equipment specified in **Table 5.27** are to be carried out.

5.5 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

5.5.1 General

In addition to the requirements of **5.2** and **5.3**, the requirements of **5.5** apply to Special Surveys of ships carrying dangerous chemicals in bulk.

5.5.2 Examinations

At Special Surveys for ships carrying dangerous chemicals in bulk, examinations specified in **4.5.2** and examinations of spaces, structures and equipment specified in **Table 5.28** are to be carried out.

Table 5.1 Internal examinations of tanks and spaces

Special Survey	Tanks and spaces subject to examination	Note
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	• Cargo holds • Cofferdams • Ballast tanks • Cargo tanks (other than those of tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk) • Peak tanks • Machinery spaces and other spaces	• Ballast tanks (excluding double bottom tanks) where the protective coating in found in poor condition and it is not renewed or where a protective coating has not been applied, internal examinations are to be carried out at annual intervals. For double bottom ballast tanks in this condition, internal examinations are to be carried out at annual intervals where considered necessary by the Surveyor. • For holds insulated for the carriage of refrigerated cargo, the limber boards and the cover plates are to be removed and an examination of the inside is to be carried out. In addition, an examination behind the insulation in to be carried out at representative locations. The examination may be limited to verification that the protective coating remains effective and that there are no visible structural defects. Where poor coating condition in found, the examination is to be extended as deemed necessary by the Surveyor.
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	• Tanks and spaces subject to examination carried out at Special Survey No.1 • Fresh water tanks • Fuel oil tanks in cargo areas for tankers or in cargo length areas for other ships	• If fresh water tanks and fuel oil tanks have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one selected tank respectively. Notwithstanding the above peak tanks are to be subject to internal examinations at each Special Survey.

Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	• Tanks and spaces subject to examination carried out at Special Survey No.2 • Fuel oil tanks	• For fuel oil tanks: (1) If fuel oil tanks in cargo areas for tankers or in cargo length areas for other ships have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just two selected tanks. In cases where deep fuel oil tanks are provided, one or more deep tanks are to be included in this scope. (2) If fuel oil tanks other than those mentioned in **(1)** have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one tank selected from those in engine rooms. Notwithstanding the above peak tanks are to be subject to internal examinations at each Special Survey.
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	• Tanks and spaces subject to examination carried out at Special Survey No.3 • Lubricating oil tanks	• For fuel oil tanks: (1) If fuel oil tanks in cargo areas for tankers or in cargo length areas for other ships have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to half of the selected tanks, but not less than two tanks. In cases where deep fuel oil tanks are provided, one or more deep tanks are to be included in this scope. (2) If fuel oil tanks other than those mentioned in **(1)** have had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one tank selected from those in engine rooms. Notwithstanding the above peak tanks are to be subject to internal examinations at each Special Survey. If lubricating oil tanks had external examinations and the Surveyor is satisfied that they are in good condition, the scope of any internal examinations may be reduced to just one selected tank. Notwithstanding the above peak tanks are to be subject to internal examinations at each Special Survey.

Table 5.2 Additional requirements of internal examinations for tankers and ships carrying dangerous chemicals in bulk and ships carrying liquefied in Bulk

Special Survey	Tanks and spaces subject to examination	Note
All Special Surveys	1 All cargo tanks (excluding those in ships carrying liquefied gases in bulk)	• For oil tankers, combined cargo/ballast tanks, if any, are to be examined carefully tanking account of ballast history and the extent of the corrosion prevention system provided. • For oil tankers, condition of the inner surface of the bottom plating of the tanks is to be examined carefully in order to ascertain that the there is no excessive pitting of the plating. • For oil tankers, bell mouths of the cargo suction pipes are to be removed and the bottom plating of the tank and bulkheads in that vicinity are to be examined as considered necessary by the Surveyor.
	2 All ballast tanks, and all tanks and spaces adjacent to cargo tanks (pump rooms, cargo compressor rooms, pipe tunnels, cofferdams and void spaces)	For tankers and ships carrying dangerous chemicals in bulk: • As a result of internal examinations, ballast tanks with condition shown in (a) and (b) require an internal examination to be carried out at annual intervals. • The protective coating is found to be in less than good condition and is not repaired to the satisfaction of the Surveyor. • The protective coating has not been applied from the time of construction or the soft coating has been applied (the examination is to be extended to the ballast tanks of the same type). • An internal examination of the pump room is to be carried out carefully paying attention to the sealing arrangements of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of pumps. • For ships carrying liquefied gases in bulk: • For ballast tanks, excluding double bottom tanks, where a protective coating is found in poor condition and it is not renewed or where a protective coating has not been applied from the time of construction, an internal examination is to be carried out at annuals intervals. For ballast double bottom tanks with the condition as specified, where considered necessary by the Surveyor, an internal examination is to be carried out at annual intervals. • Ballast tanks converted to void spaces are to be examined applying the provisions for ballast tanks correspondingly.

Table 5.3 Additional Requirements of internal examinations for Bulk Carriers

Special Survey	Tanks and spaces subject to examination	Notes
All Special Surveys	1 All ballast tanks, and all tanks and spaces adjacent to cargo holds (pipe tunnels, cofferdams and void spaces)	• For ballast tanks, excluding double bottom tanks, where a protective coating is found in poor condition and it is not renewed or where a protective coating has not been applied from the time of construction, an internal examination is to be carried out at annuals intervals. For ballast double bottom tanks in this condition an internal examination is to be carried out at annual intervals where considered necessary by the Surveyor. • Ballast tanks converted to void spaces are to be examined applying the provisions for ballast tanks.

Table 5.4 Additional Requirements of internal examinations for general dry cargo ships of not less than 500 gross tonnage

Special Survey	Tanks and spaces subject to examination	Notes
All Special Surveys	1 All cargo holds	
	2 All ballast tanks, and all tanks and spaces adjacent to cargo holds (pipe tunnels, cofferdams and void spaces)	• For ballast tanks where the protective coating is found in poor condition, and it is not renewed or where a protective coating has not been applied, excluding double bottom tanks, an internal examination is to be carried out at annuals intervals. For double bottom ballast tanks in this condition an internal examination is to be carried out at annual intervals where considered necessary by the Surveyor. • Ballast tanks converted to void spaces are to be examined applying the provisions for ballast tanks.

Special Survey	Structural members subject to Close-up Survey
Requirements for Tankers and Ships Carrying Dangerous Chemical in bulk without Double Hull Structure	
Special survey for ships up to 5 *years* of age (special survey No. 1)	1. One Web Frame (A) – in a ballast wing tank, if any, or cargo wing tank used primarily. 2. One Deck Transverse (B) – in a cargo tank or on deck 3. The lower part of one Transverse Bulkhead (D) – in a ballast tank 4. The lower part of one Transverse Bulkhead (D) – in a cargo wing tank 5. The lower part of one Transverse Bulkhead (D) in a cargo center tank
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No. 2)	1. All Web Frames (A) – in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast. 2. One Deck Transverse (B) – in or cargo wing tank 3. One Deck Transverse (B) – in or on two cargo centre tanks 4. Both Transverse Bulkheads (C) – in a ballast wing tanks, if any, or a cargo wing tank used primarily water ballast 5. The lower part of one Transverse Bulkhead (D) – in each remaining ballast tank 6. The lower part of one Transverse Bulkhead (D) – in a cargo wing tank 7. The lower part of one Transverse Bulkhead (D) – in two cargo centre tanks
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All Web Frames (A) – in all ballast tanks 2. All Web frames (A) – in cargo wing tanks 3. A minimum of 30% [*1] of all Deck and Bottom Transverse (E)- in each cargo centre tank (only for oil tankers)
Special Survey for ships up to 15 *years* of age (Special Survey No.4)and subsequent Special surveys	As Special Survey No.3 Additional Transverses included as deemed necessary by the Surveyor.
Requirements for Tankers and Ships Carrying Dangerous chemicals in bulk having Double hull structure	
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. One Web Frame (A) – in a ballast double hull tank[*2] 2. One Deck Transverse (B) – in a cargo tank or on deck 3. One Transverse Bulkhead (C) – in a ballast double hull tank[*2] 4. The lower part of one Transverse Bulkhead (D) – in a cargo wing tank[*3] 5. The lower part of one Transverse Bulkhead (D) – in a cargo centre tank

Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. All Web Frames (A) – in a ballast double hull tank[*2] 2. The knuckle area and the top part of one Web Frame (G) – in each remaining ballast tank 3. One Deck transverse (B) – in or two cargo tanks 4. One transverse Bulkhead (C) – in all double hull tanks[*2] 5. The lower part of one transverse Bulkhead (D) – in cargo wing tank[*3] 6. The lower part of one transverse Bulkhead (D) – in two cargo centre tanks
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All Web Frames (A) – in a ballast tanks 2. All Web Frames (A) – in a cargo wing tank (or a cargo tank for oil tankers) 3. One Web Frames (A) – in each remaining cargo tank 4. All Transverse Bulkheads (C) – in all cargo and ballast tanks
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. As Special Survey No.3 2. Additional transverse included as deemed necessary by the Surveyor.

Notes:

Letters in this table mean:

(A): Cross ties and complete transverse web frame ring including adjacent structural members such as shell plating, longitudinal bulkheads, longitudinal stiffeners, and brackets.

(B): Including deck structural members adjacent to deck transverses such as deck plating, longitudinal stiffeners, and brackets.

(C) and (D): Including vertical and horizontal girders and structural members adjacent to transverse bulkheads such as longitudinal bulkheads, inner bottom plating, hopper plating, bottom girders, brackets, and stiffeners; and internal structure of lower and upper stools, where fitted.

(E): Including structural members adjacent to deck and bottom transverses such as deck plating, bottom plating, and longitudinal stiffeners.

(F): Additional complete transverse web frame ring including adjacent structural members listed in A

(G): The knuckle area includes the slope hopper plating and where it connects to the inner hull bulkhead and inner bottom plating; up to 2 *meters* from the corners along the bulkhead and double bottom; and adjacent structural members.

The top part includes the top 5 *meters* (3 *meters* for ships carrying dangerous chemicals in bulk) of the web frame and adjacent structural members.

*1: The 30% is to be rounded up to the next whole integer

*2: "Ballast double hull tank" mean all ballast tanks consisting of the double bottom tank, double side tank, and double deck tank, as applicable, even though these tanks are separate.

3: For double hull that have no centre cargo tanks (as in the case of tanks with a center longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.

Table 5.5-1 (2) Requirements of Close-up Survey for Oil tankers and Ships Carrying Chemical in Bulk

Special Survey	Structural members subject to the Close-up Survey
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All Web Frame Rings (A) - in all ballast tank 2. All Web Frame Rings (A) – in a cargo wing tank (or a cargo tank for double hull oil tankers) 3. A minimum of 30% of all Web Frames Rings (A) in each remaining cargo wing tank*3 (only for single hull oil tankers) 4. One Web Frame Ring (A)) in each remaining cargo tank (except for single hull oil tankers) 5. All Transverse Bulkheads (C) - in all cargo and ballast tanks 6. A minimum of 30% of all Deck and Bottom Transverse (E) - in each cargo centre tank (only for single hull oil tankers) 7. Other areas considered necessary by the Surveyor (F) (only for oil tankers)
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	As Special Survey No.3. Additional transverses included as deemed necessary by the Surveyor.

Notes:

Letters in this table mean:

(A): Cross ties and complete transverse web frame ring including adjacent structural members such as shell plating, longitudinal bulkheads, longitudinal stiffeners, and brackets.

(B): Including deck structural members adjacent to deck transverses such as deck plating, longitudinal stiffeners, and brackets.

(C) and (D): Including vertical and horizontal girders and structural members adjacent to transverse bulkheads such as longitudinal bulkheads, inner bottom plating, hopper plating, bottom girders, brackets, and stiffeners; and internal structure of lower and upper stools, where fitted.

(E): Including structural members adjacent to deck and bottom transverses such as deck plating, bottom plating, and longitudinal stiffeners.

(F): Additional complete transverse web frame ring including adjacent structural members listed in A

(G): The knuckle area includes the slope hopper plating and where it connects to the inner hull bulkhead and inner bottom plating; up to 2 *meters* from the corners along the bulkhead and double bottom; and adjacent structural members.

The top part includes the top 5 *meters* (3 *meters* for ships carrying dangerous chemicals in bulk) of the web frame and adjacent structural members.

*1: Double hull tank includes the double bottom tank, double side tank, and double deck tank, as applicable, even though these tanks are separate.

*2: For double hull that have no center cargo tanks (as in the case of tanks with a center longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.

*3: The 30% is to be rounded up to the next whole integer.

Table 5.5-2 Requirements of Close-up Surveys for Ships Carrying Liquefied Gases in Bulk

Special Survey	Structural members subject to the Close-up Survey*2
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. One web frame in a representative ballast tank of the topside, hopper side and double hull side type (A) 2. Lower part of one transverse bulkhead in a ballast tank*2 (C)
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	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) (A) 2. One web frame in each remaining ballast tank (A) 3. One transverse bulkhead in each ballast tank (B)
Special Survey for ships over 10 *years* of age (Special Survey No.3 and subsequent Special Surveys)	1. All web frame in all ballast tank (A) 2. All transverse bulkheads in all ballast tanks (B)

Notes:
Letters in this mean:

(A): Cross Ties and complete transverse web frame rings including adjacent structural members such as shell plating, longitudinal bulkheads, longitudinal stiffeners, brackets, etc.

(B): Including vertical and horizontal girders, adjacent structural members and adjacent longitudinal bulkhead structure.

(C): Including vertical and horizontal girders and adjacent structural members.

*1: One ballast tanks can be selected from ballast tanks including peak tanks.

*2: 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 specially considered at the discretion of the Surveyor.

Table 5.6-1(1) Requirements of Close-up Surveys for Bulk Carriers (excluding Ore Carriers)

Special Survey	Structural members subject to the Close-up Survey
Requirements for Bulk Carriers other than Double Skin Bulk Carriers[*1]	
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. All shell frames in all cargo holds including their attachments and adjacent shell plating (A) 2. Two selected cargo hold transverse bulkheads an lower part of remaining transverse bulkheads (including stiffeners and girders) (C) 3. One transverse web with associated plating and longitudinals in two representative ballast tanks of each type (topside or bilge hopper tank) (B) 4. Air pipes and sounding pipes in cargo holds in way of tank top
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. All shell frames in all cargo holds including their attachments and adjacent shell plating (A) 2. All transverse bulkheads (including stiffeners and girders) in all cargo holds (C) 3. About half of transverse webs with associated plating and longitudinals, and upper and power parts of each bulkhead in a representative ballast tank of each type (topside or bilge hopper tank) (B) 4. One transverse web with associated plating and longitudinals in each of the remaining ballast tank (B) 5. Both forward and aft transverse bulkheads (including stiffeners and girders) in one ballast tanks (B) 6. All deck plating and under deck structure inside the line of hatch openings between cargo hold hatches 7. All piping arrangements in cargo hold. If the Surveyor considers it necessary, airtight tests are to be carried out.

Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All shell frames in all cargo holds including their attachments and adjacent shell plating (A) 2. All transverse bulkheads (including stiffeners and girders) in all cargo holds (C) 3. All transverse webs with associated plating and longitudinals, and all transverse bulkheads (including stiffeners and girders) in each ballast tank (B) 4. Structural members specified in 6. and 7. Of Special Survey No.2 above
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. As Special Survey No.3

Notes:

1 Letters in this table mean:

(a) Cargo hold transverse frames, or stiffeners on side shell or longitudinal bulkhead in double side tanks

(b) Transverse web frame ring or watertight transverse bulkhead in fore and aft peak, topside, bilge hopper and double side ballast tanks including adjacent structural members

(c) Including plating and internal structures of lower and upper stools, where fitted

2 Close-up Surveys of transverse bulkheads are to be carried out at least at four levels as specified as follows:

(a) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.

(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.

(c) About mid-height of the bulkhead.

(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.

*[1]: For bulk carriers with hybrid cargo hold arrangements, that is, with some cargo holds of single side skin and others of double side skin, the Requirements for Double Skin Bulk Carriers are to apply to cargo holds of double side skin and associated wing spaces.

Table 5.6-1(2) Requirements of Close-up Surveys for Bulk Carriers (excluding Ore Carriers)

Special Survey	Structural members subject to the Close-up Survey
Requirements for Double Skin Bulk Carriers(excluding ore Carriers)	
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Two selected cargo hold transverse bulkheads an lower part of remaining transverse bulkheads (including stiffeners and girders) (C) 2. One transverse web with associated plating and longitudinals in two representative ballast tanks of each type (this is to include the foremost topside and double side ballast tanks on either side) (B) 3. Air pipes and sounding pipes in cargo holds in way of tank top
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. One transverse bulkhead in each cargo hold and lower part of remaining transverse bulkheads (including stiffeners and girders) (C) 2. About half of transverse webs with associated plating and longitudinals in a representative ballast tank of each type (topside bilge hopper or side tank) (B) 3. One transverse web with associated plating and longitudinals in each of the remaining ballast tank (B) 4. Both forward and aft transverse bulkheads (including stiffeners and girders) in a transverse section including topside, bilge hopper and double side ballast tanks on one side of the ship (B) 5. A sufficient number (at least ¼ of total number) of stiffeners on side shell and longitudinal bulkhead at forward, middle, and aft parts on both sides of the foremost double side tanks (A) 6. All deck plating and under deck structure inside the line of hatch openings between cargo hold hatches 7. All piping arrangements in cargo holds. If the surveyor considers it necessary, airtight tests are to be carried out.

Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All transverse bulkheads (including stiffeners and girders) in all cargo holds (C) 2. All transverse webs with associated plating and longitudinals, and all transverse bulkheads (including stiffeners and girders) in each ballast tank (B) 3. A sufficient number (at least ¼ of total number) of stiffeners on side shell and longitudinal bulkhead at forward, middle, and aft parts on both sides of all double side tanks (A) 4. Structural members specified in 6 and 7 of Special Survey No.2 above
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. All stiffeners on side shell and longitudinal bulkhead in all double side tanks (A) 2. Structural members specified in 1, 2, and 4. of Special Survey No.3 above

Notes:

1 Letters in this table mean:

(A): Cargo hold transverse frames, or stiffeners on side shell or longitudinal bulkhead in double side tanks

(B): Transverse web frame ring or watertight transverse bulkhead in fore and aft peak, topside, bilge hopper and double side ballast tanks including adjacent structural members

(C): Including plating and internal structures of lower and upper stools, where fitted

2 Close-up Surveys of transverse bulkheads are to be carried out at least at four levels as specified as follows:

(i) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.

(ii) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.

(iii) About mid-height of the bulkhead.

(iv) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

3) A double side tank of double skin bulk carriers is to be considered as a separate tank even if it is in connection to either the topside tank or the bilge hopper tank.

Table 5.6-2 Requirements of Close-up Surveys for Ore Carriers

Special Survey	Structural members subject to the Close-up Survey
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. One web frame rings in a ballast wing tank (A) 2. Lower part of one transverse bulkhead in a ballast tank (D) 3. Two selected cargo hold transverse bulkheads an lower part of remaining transverse bulkheads (including stiffeners and girders) (E) 4. Air pipes and sounding pipes in cargo holds in way of tank top
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. All web frame rings in a ballast wing tank (A) 2. One deck transverse in each remaining ballast tank (B) 3. Forward and aft transverse in bulkheads in a ballast wing tank (C) 4. Lower part of one transverse bulkhead in each remaining ballast tank (D) 5. One transverse bulkhead in each cargo hold and lower part of remaining transverse bulkheads (including stiffeners and girders) (E) 6. All deck plating and under deck structure inside the line of hatch openings between cargo hold hatches 7. All piping arrangements in cargo holds. If the Surveyor considers it necessary, airtight tests are to be carried out.
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All web frame rings in all ballast tank (A) 2. All transverse bulkheads in each ballast tanks (C) 3. One web frame ring in all in each wing void space (A) However, additional close-up surveys may be carried out for other web frame rings in void spaces as deemed necessary by the Surveyor 4. All transverse bulkheads in each cargo hold (including stiffeners and girders) (E) 5. Structural members specified in 6., and 7. of Special Survey No.2 above
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. As Special Survey No.3

Notes:

1 Letters in this table mean:

(A): Cross Ties and complete transverse web frame rings including adjacent structural members such as shell plating, longitudinal bulkheads, longitudinal stiffeners, brackets, etc.

(B): Including deck structures adjacent to deck transverse such as deck plating, longitudinal stiffeners, brackets, etc.

(C) and (D): Including vertical and horizontal girders, and adjacent structural members such as longitudinal bulkheads, inner bottom plating, hopper plating, bottom girders, brackets, stiffeners, etc.

(E): Including plating and internal structures of lower and upper stools, where fitted

2 Close-up Surveys of transverse bulkheads are to be carried out at least at four levels as specified as follows:

(i): Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.

(ii): Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.

(iii): About mid-height of the bulkhead.

(iv): Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

Table 5.7 Requirements of Close-up Surveys for General Dry Cargo Ships of not less than 500 gross tonnage

Special Survey	Structural members subject to the Close-up Survey
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Selected shell frames in one forward and after cargo holds associated tween deck spaces and lower part of remaining shell frames including their end attachments and adjacent shell plating 2. Lower parts of shell frames in remaining cargo holds including their end attachments and adjacent shell plating 3. One selected transverse bulkhead and lower part of remaining transverse bulkheads (including stiffeners and girders) 4. Air pipes and sounding pipes in cargo holds in way of tank top

Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Selected shell frames in all cargo holds associated tween deck spaces and lower part of remaining shell frames including their end attachments and adjacent shell plating 2. One transverse bulkhead and lower part of remaining transverse bulkheads in each cargo hold (including stiffeners and girders) 3. Both forward and aft bulkhead (including stiffeners and girders) in one side ballast tank 4. One transverse web with associated plating and longitudinals in two representative ballast tanks of each type (topside, bilge hopper, side tank or double bottom tank) 5. Selected area of deck plating and under deck structure inside the line of hatch openings between cargo hatches 6. Selected area of inner bottom plating 7. Air pipes and sounding pipes in cargo holds in way of tank top
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. All shell frames in the forward cargo hold (the forward lower cargo hold in the case of tween deck spaces), and 25% of frames in each of the remaining cargo holds (tween deck spaces including the cargo holds for the forward lower cargo hold in the case of tween deck spaces), and lower part of remaining shell frames including their end attachments and adjacent shell plating 2. All transverse bulkheads (including stiffeners and girders)in all cargo holds 3. All transverse bulkheads (including stiffeners and girders)in all ballast tanks 4. All transverse webs with associated plating and longitudinals, in each ballast tank ~~5.~~ All deck plating and under deck structure inside the line of hatch openings between cargo hold hatches 6. All area of inner bottom plating 7. Air pipes and sounding pipes in cargo holds in way of tank top
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. All shell frames all cargo holds, and associated tween deck spaces, including their end attachments and adjacent shell plating 2. Structural members specified in 2. to 7. of Special Survey No.3 above

Notes:

Close-up Surveys of transverse bulkheads are to be carried out at least at three levels as specified as follows:

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 upper deck plating and tween deck plating.

Table 5.8 Requirements for Thickness Measurements for Cargo Ships

Special Survey	Structural members subject to the Close-up Survey
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Each plate in one section of the strength deck plating for the full beam of the ship within 0.5*L* amidships 3. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Each plate and member in two transverse sections within 0.5*L* amidships (in way of two different cargo spaces, if applicable.) When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Internals in fore and aft. peak tank 4. Both ends and middle part of each hatch side and end coaming (plating and stiffeners) 5. All cargo hold hatch covers (plating and stiffeners) 6. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 15 of age (Special Survey No.4 and subsequent special surveys)	1. Suspect areas 2. Following portions of structural members: (1) All exposed main deck plates, full length

	(2) Each plate and member in three transverse sections of cargo areas within 0.5*L* amidships. When the selected section is a transversely framed section, adjacent frames and their and connections in way of the transverse section are to be included (3) All wind and water strakes, port and starboard, full length 3. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 4. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery spaces and aft end of tanks 5. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 6. In all cargo holds, all lowest strakes and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces together with internals in way 7. Structural members specified in 3. to 5. of Special Survey No.3

Table 5.9 Requirements of Additional Thickness Measurements for Cargo Ships in Way of Substantial Corrosion

Structural Members	Extent of Measurement	Pattem ok Measurement
1. Plating	Suspect areas and adjacent plates	5 point pattern over 1 *square meter*
2. Girders	Suspect areas	5 point pattern over 1 *square meter*
3 Stiffeners	Suspect areas	3measurements in line across web 3 measurements on flange

Table 5.10-1(1) Requirements of Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk

Special Survey	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. Each deck plating in one transverse section in way of a ballast tank, if any, or a cargo tank used primarily for water ballast within the cargo area 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2**
	1. Suspect areas 2. Within the cargo area:

Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	(1) Each deck plate (2) One transverse section. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo the cargo area 5. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2**
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) Two transverse sections. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo the cargo area 5. All wind and water strakes within the cargo area. 6. Internals in fore and aft. peak tank 7. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2** 8. For ships carrying dangerous chemicals in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tank

Table 5.10-1(2) Requirements of Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk

Special Survey	Structural members subject to Thickness measurement
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) Three transverse sections. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All wind and water strakes 5. Internals in fore and aft. peak tank 6. All exposed main deck plating outside the cargo area 7. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 8. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks 9. Plating of sea chest, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 10. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2** 11. For ships carrying dangerous chemicals in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks

Table 5.10-2 Requirements of Thickness Measurements for Ships Carrying Liquefied Gases in Bulk

Special Survey	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect áreas 2. One transverse section of deck plating for the full beam of the within 0.5*L* amidships in way of a ballast tank, if any 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) One transverse section within 0.5L amidships in way of ballast tank, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo area
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) Two transverse sections. At least one section is to include a ballast tank within 0.5*L* amidships, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) All wind and water strakes within the cargo area 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo the cargo area 5. Internals in fore peak tank and after peak tank

Special Survey for ships over 15 years of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2)Three transverse sections. At least one section is to include a ballast tank within 0.5*L* amidships, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate (4) Duct keel plating and internals 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All wind and water strakes 5. Internals in fore peak tank and after peak tank 6. All exposed main deck plating outside the cargo area 7. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 8. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks 9. Plating of sea chest, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor)

Table 5.11 Requirements of Additional Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in bulk (Bottom Structure)

Structural member	Extent of Measurement	Pattern of Measurement
1. Inner bottom, bottom and hopper structure plating	a) Minimum of 3 bays across tank, including aft bay. Measurements around and under all bell mouths. b) Suspect plates and adjacent plates, if any	a) 5 point pattern for each between longitudinals and floors/webs b) 5 point pattern over $1m$ length for each panel between longitudinals
2. Inner bottom, bottom and hopper structure longitudinals	Minimum of 3 longitudinals in each bay where plating was measured	3 measurements in line across flange and 3 measurement on vertical web
3. Bottom girders and brackets	At fore and aft floors or transverse bulkhead bracket toes, and in centre of tanks.	Vertical line of single measurement on girder plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face flat, if any. 5 point pattern on girder-bulkhead brackets, if any.
4. Bottom transverse webs/floors	3 webs/floors in bays where bottom plating was measured, with measurements at both ends and middle.	5 point pattern over $2m^2$ area. Single measurements on face flat, if any.
5. Panel stiffening (if any)	Where fitted	Single measurement
6. Hopper structure web frame rings (except for single hull oil tankers)	3 web frame rings in bays where bottom plating was measured	5 point pattern over $1m^2$ of plating. Single measurements on flange.
7. Hopper structure transverse watertight bulkheads or swash bulkheads (except for single hull oil tankers)	a) Lower 1/3 of bulkhead b) upper 2/3 of bulkhead c) stiffeners (minimum of three)	a) 5 point pattern over $1m^2$ of plating b) 5 point pattern over $2m^2$ of plating c) For web, 5 point pattern over span (two measurements across web at each end and one at center of span). For flange, single measurements at each end and center of span.

Table 5.12 Requirements of Additional Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk (Deck Structure)

Structural member	Extent of Measurement	Pattern of Measurements
1. Deck plating	• Two transverse bands across tank	Pattern of Measurements per plate per band
2. Deck longitudinals	• Minimum of 3 longitudinals in each of two bays (only for single hull oil tankers) • Every third longitudinal in each of two bands with a minimum of one longitudinal (except for single hull oil tankers)	3 measurements in line vertically on webs, and 2 measurement on flange (if fitted)
3. Deck girders and brackets	• At fore and aft transverse bulkheads, bracket toes, and in center of tanks.	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. 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 about $1m^2$ (for single hull oil tankers, 2 m^2) areas. Single measurements on flange
5. Vertical webs and transverse bulkheads in wing ballast tank within 2m from deck (only for double hull)	• Minimum of two webs, and both transverse bulkheads	5 point pattern over about $1m^2$ areas
6. Panel stiffening	• Where applicable	Single measurement

Table 5.13 Requirements of Additional Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk (Side Shell and Longitudinal Bulkheads)

Structural member	Extent of Measurement	Pattern of Measurement
1. Side shell and longitudinal bulkhead plating: . Deckhead and bottom strakes, and strakes in way of horizontal stringers . All other strakes	• Plating between each pair of longitudinals in a minimum of 3 bays • Plating between every 3rd pair of longitudinals in same 3 bays	• Single measurement • Single measurement
2. Side shell and longitudinal bulkhead longitudinal on: . Deckhead and bottom strakes . All other strakes	• Each longitudinal in same 3 bays • Every third longitudinal in same 3 bays	• 3 measurements across web and 1 measurement on flange • 3 measurements across web and 1 measurement on flange
3. Brackets fitted to longitudinals	• Minimum of 3 at top, middle and bottom of tank in same 3 bays	• 5 point pattern over area of bracket
4. Vertical webs and transverse bulkheads excluding deck head area (only for wing ballast tanks of double hull oil tankers and ships carrying dangerous chemical in bulk): . Strakes in way of horizontal girders . All other strakes	• Minimum of 2 webs, and both transverse bulkheads • Minimum of 2 webs, and both transverse bulkheads	• 5 point pattern over approximately 2 m^2 area. • 2 measurements between each pair of vertical stiffeners.
5. Horizontal girders (only for ships carrying dangerous chemicals in bulk and wing ballast tanks of double hull oil tankers)	• Plating one each girder in minimum of 3 bays	• 2 measurements between each pair of horizontal girder stiffeners.
6. Horizontal girders stiffeners (only for ships carrying dangerous chemicals in bulk and wing ballast tanks of double hull oil tankers)	• Where applicable	• Single measurement
7. Web frames, transverses and cross ties (except for wing ballast tanks of double hull oil tankers and ships carrying dangerous chemical in bulk)	• 3 webs with minimum of three locations on each web, including in way of cross tie connections	• 5 point pattern over about 2m^2 area, plus single measurement on flanges of web frame, transverse and cross ties

Table 5.14 Requirements of Additional Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk (Transverse Bulkheads and Swash Bulkheads Except for Wing Ballast Tanks of Double Hull Oil Tankers)

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 or deck plating • Transverse band within 25 *mm* of welded connection to shelf plate	• 5 point pattern over about 1 *m* length
2. Deck head and bottom strakes, and strakes in way of horizontal stringers	• Plating between pairs of stiffeners at 3 locations at approximately 1/4,1/2 and 3/4 width of tank	• 5 point pattern over about 1*m* length between stiffeners
3. All other strakes	• Plating between pairs of stiffeners at middle location	• Single measurement
4. Strakes in corrugated bulkhead	• Plating for each change of scantling at center of panel and at flange of fabricated connection	• 5 point pattern over about $1m^2$ of plating
5. Stiffeners	• Minimum of three typical stiffeners	• For web, 5 point pattern over span between bracket connections (2 measurements cross web at each bracket connection, and one at centre of span). For flange, single measurement 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. Deep webs and girders	• Measurements at toe of bracket and at centre of span	• For web, 5 point pattern over about 1 m^2. 3 measurements across face flat.
8. Horizontal Stringers	• All horizontal stringers with measurements at both ends and middle	• 5 point pattern over $1m^2$ area, plus single measurements near brackets toes and on face flats

Table 5.15(1) Requirements of Thickness Measurements for Bulk Carriers

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. At least the following structural members for general assessment and recording of corrosion pattern: (1) Lower parts of webs and lower end brackets of at least three hold frames at forward, middle, and aft parts on both sides of each cargo hold of single side skin (2) At least one plate of lowest strake of each transverse bulkhead (3) Other structural members subject to close-up survey
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Structural members within the cargo length area: (1) Two transverse sections of deck plating, outside the line of cargo hatch openings (2) All strength deck plating, where log cargoes or other cargoes that are prone to accelerate corrosion are loaded 3. At least the following structural members for general assessment and recording of corrosion pattern: (1) All shell frames including their end brackets in the forward cargo hold of single side skin (2) A sufficient number (at least 1/4 of total number for ships less than 100,000 DWT and at least 1/2 of total number for ships of 100,000 DWT or more) of shell frames including their end brackets at forward, middle, and aft parts on both sides of each remaining cargo hold of single side skin (3) Other structural members subject to close-up survey 4. Wind and water strakes in way of the transverse sections of 2.(1) above 5. Selected wind and water strakes outside the cargo length area

Table 5.15(2) Requirements of Thickness Measurements for Bulk Carriers

Special Survey	Structural members subject to thickness measurement
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Two transverse sections, one in the midship area, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. At least the following structural members for general assessment and recording of corrosion pattern: (1) All shell frames including their end brackets in the forward cargo hold o single side skin (2) A sufficient number (at least 1/2 of total number) of shell frames including their end brackets at forward, middle, and aft parts on both sides of each remaining cargo hold of single side skin (3) Other structural members subject to close-up survey 4. Internals in fore and aft peak tanks 5. All wind and water strakes within the cargo length area 6. Selected wind and water strakes outside the cargo length area
Special Survey for ships over 15 years of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Three transverse sections, one in the midship, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate 3. At least the following structural members for general assessment and recording of corrosion pattern: (1) All shell frames including their end brackets in the forward cargo hold o single side skin (2) Other structural members subject to close-up survey 4. Internals in fore and aft peak tanks 5. All exposed main deck plating outside the cargo area 6. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 7. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks 8. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 9. All wind and water strakes

Table 5.16 Requirements of Additional Thickness Measurements for Bulk Carriers (Shell Structures for Cargo Holds of Single Side Skin, or Structures in Double Side Skin Spaces including Wing Void Spaces in Ore Carriers)

Structural member	Extent of Measurement	Pattern of Measurement
For cargo holds of single side skin		
1. Bottom and Side Shell Plating	a) Suspect plates and four adjacent plates b) For tanks and cargo holds, see other tables for particulars on gauging	a) 5 point pattern for each panel between longitudinals
2. Bottom/Side Shell Longitudinals	Minimum of three longitudinals in way of suspect areas	3 measurements in line across web 3 measurements on flange
For cargo holds of double side skin		
1. Side shell and inner plating: • . Upper strakes and strakes in way of horizontal girders • .All other strakes	• Plating between each pair of transverse frames or longitudinals in a minimum of three bays (along the tank) • Plating between every third pair of longitudinals in same three bays	• Single measurement • Single measurement
2. Side shell and inner side transverse frames/longitudinals on: • . Upper strake • .All other strakes	• Each transverse frame/longitudinal in same three bays • Every third transverse frame/longitudinal in same three bays	• Three measurements across web and 1 measurements on flange • Three measurements across web and 1 measurements on flange
3.Transverse frames/longitudinals-brackets	Minimum of three areas at top, middle and bottom of tank in same three bays	Five-point pattern over area of bracket
4. Vertical web and transverse bulkheads: • . Strakes in a way of horizontal girders • . Other strakes	• Minimum of two webs and both transverse bulkheads • Minimum of two webs and both transverse bulkheads	• Five-point pattern over approx. two square *meter* area • 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

Table 5.17 Requirements of Additional Thickness Measurements for Bulk Carriers (Transverse Bulkheads in Cargo Holds)

Structural member	Extent of Measurement	Pattern of Measurement
1. Lower Stool	a) Transverse band within 25 *mm* of welded connection to inner bottom b) Transverse band within 25 *mm* of welded connection to shelf plate	5 point over 1 *meter* length between stiffeners
2. Transverse bulkhead	a) Transverse band at approximately middle height b) Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with an upper stool)	5 point over 1 *meter* length between stiffeners

Table 5.18 Requirements of Additional Thickness Measurements for Bulk Carriers (Deck Structure Including Cross Deck, Main Deck, 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 over 1 *meter* length between underdeck stiffeners
2. Underdeck Stiffeners	a) Transverse members b) Longitudinals member	a) 5 point pattern at each end and mid span b) 5 point pattern on both web and flange
3. Hatch Covers	a) Side and end skirt, each 3 locations b) 3 longitudinals bands, outboard strakes (2) and centerline strake (1)	a) 5 point pattern at each location b) 5 point measurement each band
4. Hatch Coamings	Lower 1/3 and upper 2/3 of each side and end coaming	5 point measurement each band i.e end or side coaming
5. Topside water Ballast Tanks	a) Watertight transverse bulkhead i. lower 1/3 of bulkhead ii. upper 2/3 of bulkhead iii. stiffeners b) 2 representative swash transverse bulkheads i. lower 1/3 of bulkhead ii. upper 2/3 of bulkhead iii. stiffeners c) 3 representative bays of sloping plating i. lower 1/3 of tank ii. upper 2/3 of tank d) Longitudinals, suspect and adjacent	a) i. 5 point pattern over 1 *sq. meter* of plating ii. 5 point pattern over 1 *sq. meter* of plating iii. 5 point pattern over 1 *meter* length b) i. 5 point pattern over 1 *sq. meter* of plating ii. 5 point pattern over 1 *sq. meter* of plating iii. 5 point pattern over 1 *meter* length c) i. 5 point pattern over 1 *sq. meter* of plating ii. 5 point pattern over 1 *sq. meter* of plating d) 5 point pattern on both web and flange over 1 meter length
6. Main Deck Plating	Suspect plates and adjacent (4)	5 point pattern over 1 *sq. meter* of plating
7. Main Deck Longitudinals	Minimum of 3 longitudinals where plating measured	5 point pattern on both web and flange over 1 *meter* length
8. Web Frames/Transverses	Suspect plates	5 point pattern over 1 *sq. meter*

Table 5.19 Requirements of Additional Thickness Measurements for Bulk Carriers (Bottom, Inner Bottom and Hopper Structure)

Structural member	Extent of Measurement	Pattern of Measurement
For cargo holds or single skin		
1. Inner/Double Bottom Plating	Suspect plates plus all adjacent plates	5 point pattern over 1 *meter* length for each panel between longitudinals
2. Inner/Double Bottom Longitudinals	3 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 *sq. meter*
4. Watertight Bulkheads (WT Floors)	a) lower 1/3 of tank b) upper 2/3 of tank	a) 5 point pattern over 1 *sq. meter* of plating b) 5 point pattern on alternate plates over about 1 *sq. meter* of plating
5.Web Frames	Suspect plates	5 point pattern over 1 *sq. metre* of plating
6. Bottom /Side shell longitudinals	Minimum of 3 longitudinals in way of suspect areas	a) 3 measurements in line across web b) 3 measurements on flange
For cargo holds of double side skin		
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	Five-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	Five- point pattern over 2 *sq. meter* of area
5 Hooper structure web frame ring	Three floors in bays where bottom plating measured	Five- point pattern over 1 *sq. meter* of plating

		• Single measurements on flange
6. Hooper structure transverse watertight bulkhead or swash bulkhead	• lower 1/3 of bulkhead	• Five- point pattern over 1 *sq. meter* of plating
	• upper 2/3 of bulkhead	• Five- point pattern over 2 *sq. meter* of plating
	• Stiffeners (minimum of three)	• Fore web, Five-point pattern over span (two measurements across web at each end and one at center of span) • For flange, single measurements at each end and one at center of span
7.Panel stiffening	Where applicable	Single measurements

Table 5.20 Requirements of Additional Thickness Measurements for Bulk Carriers (Cargo Holds of Single Side Skin)

Structural member	Extent of Measurement	Pattern of Measurement
1. Side Shell Frames	Suspect frames and adjacent frames	a) At each end and mid span: 5 point pattern of both web and flange b) 5 point pattern within 25 *mm* of welded attachment to both shell and lower slope plate

Table 5.21(1) Requirements of Thickness Measurements for General Dry Cargo Ships of not less than 500 gross tonnage

Special Survey	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. At least the following structural members for general assessment and recording of corrosion pattern: (1) In cargo holds where cargoes highly corrosive to steel such as logs, salt, coal, and sulfide ore have been loaded: lower parts of web (thinnest parts of web in case of built-up type frame) and their lower end brackets of at least three hold frames at forward, middle and aft parts on both sides of each cargo hold (2) At least one plate of lowest strake and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces specified in (1) above together with internals in way (3) For top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ands middle part(including face plate) of one transverse ring or corresponding main structural members in one tank selected arbitrarily from each type
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Following portions of structural members within 0.5*L* amidships: (1) Each plate in one section of the strength deck plating for the full beam of the ship (2) Each strength deck plate in way of water ballast tanks, if any (3) Each strength deck plate on or underneath which log cargoes or other cargoes that are prone to accelerate corrosion have been carried 3. At least the following structural members for general assessment and recording of corrosion pattern: (1) In cargo holds specified in 2.(1) of Special Survey No.1 above: lower and upper parts of web (thinnest parts of web in case of built-up type frame) and their end brackets of a sufficient number (at least 1/3 of total number) of frames at forward, middle, and aft parts on both sides of each cargo hold (2) All plates of lowest strake and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces specified in (1) above together with internals in way (3) In cargo holds other than (1) above, structural members specified in 2.(1) and (2) of Special Survey No.1 above (4) For top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ends and middle part(including face plate) of approximately half the number of transverse rings or corresponding main structural members and at least one plate of upper ends of each bulkhead in one tank selected arbitrarily from each type (5) For remaining top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ends and middle part of one transverse ring or corresponding main structural members (including face plate) (6) Other structural members subject to close-up survey 4. All cargo hold hatch coamings (plating and stiffeners) 5. All cargo hold hatch covers (plating and stiffeners)

Table 5.21(2) Requirements of Thickness Measurements for General Dry Cargo Ships of not less than 500 gross tonnage

Special Survey	Structural members subject to thickness measurement
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Each deck plating inside the line of cargo hatch openings within 0.5*L* amidships (3) Each plate and member in two transverse sections, one in the midship area, within 0.5*L* amidships (4) All wind and water strakes 3. Selected wind and water strakes outside the cargo length area 4. At least the following structural members for general assessment and recording of corrosion pattern: (1) Lower and upper parts of web (thinnest parts of web in case of built-up type frame) and their end brackets of a sufficient number (at least 1/3 of total number) of frames at forward, middle, and aft parts on both sides of each cargo hold (2) Other structural members subject to close-up survey 5. Internals in fore and aft peak tank 6. All cargo hold hatch coamings (plating and stiffeners) 7. All cargo hold hatch covers (plating and stiffeners
Special Survey for ships over 15 years of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Following portions of structural members (1) All exposed main deck plates, full length (2) Each plate and member in three transverse sections, one in the midship area, within 0.5*L* amidships (3) Each bottom plate within cargo length area, including lower turn of bilge (4) Duct keel or pipe tunnel plating and internals within cargo length area 3. All wind and water strakes 4. At least the following structural members for general assessment and recording of corrosion pattern: (1) Structural members subject to close-up survey 5. Representative exposed superstructure deck plating (poop, bilge and forecastle deck) 6. All keel plate full length, and an appropriate number of bottom plates in way of cofferdams machinery spaces and aft end of tanks 7. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 8. Structural members specified in 5. to 7. Of Special Survey No.3 above

Table 5.22 Requirements of Pressure Tests for Cargo Ships

Special Survey	Tanks subject to pressure tests
All Special Survey	1. All water tanks including cargo hold used for ballast and all cargo tanks. Pressure tests of fresh water tanks may be specially considered when deemed appropriate by the Society. 2. All fuel oil tanks Pressure tests may be specially considered when deemed appropriate by the Society. 3. All lubrication oil tanks Pressure tests may be specially considered when deemed appropriate by the Society.

Table 5.23-1 Requirements of Pressure Tests for Oil Tankers and Ships Carrying Dangerous Chemical in Bulk

Special Survey	Tanks subject to pressure tests
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, fuel oil tanks, pump rooms and cofferdams 2. All water tanks Pressure tests of fresh water tanks may be specially considered when deemed appropriate by the Society 3. All fuel oil tanks Pressure tests may be specially considered when deemed appropriate by the Society. 4. All lubrication oil tanks Pressure tests may be specially considered when deemed appropriate by the Society.
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. All cargo tank bulkhead 2. For water tanks, fuel oil tanks and lubrication oil tanks, as Special Survey No.1
Special Survey for ships over 10 of age (Special Survey No.3 and subsequent Special Surveys)	1. All cargo tank bulkhead 2. For water tanks, fuel oil tanks and lubrication oil tanks, as Special Survey No.1 3. For ships carrying dangerous chemical in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks

Table 5.23-2 Requirements of Pressure Tests for Ships Carrying Liquefied Gases in Bulk

Special Survey	Tanks subject to pressure tests
All Special Surveys	1. All boundaries of ballast tanks and deep tanks within the cargo area 2. Representative fuel oil tanks within the cargo area. When deemed appropriate by the Society, pressure tests may be specially considered. 3. All water tanks Pressure tests of fresh water tanks may be specially considered when deemed appropriate by the Society. 4. All fuel oil tanks outside the cargo area Pressure tests may be specially considered when deemed appropriate by the Society. 5. All lubrication oil tanks Pressure tests may be specially considered when deemed appropriate by the Society.

Table 5.24 Requirements of Pressure Tests of Bulk Carriers and Dry Cargo Ships of not less than 500 gross tonnage

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

Table 5.25 Additional Requirements at Special Surveys for Machinery

Items	Examinations
1 Diesel engines (main propulsion machinery and auxiliary machinery for propulsion, maneouvring and personnel safety)	(a) The essential part of the crankcase and cylinder jacket, the foundation bolts, the chock liners and the tie rod bolts are to be generally examined. (b) The doors of the crankcase and the explosion relief devices of the crankcase and scavenge space are to be generally examined. (c) The anti-vibration dampers detuners, balancers, and compensators are to be generally examined. (d) The crankshaft alignment is to be checked and if necessary, adjusted.
2 Electrical installations	(a) The switchboards (including those for emergency), distribution boards, cables, etc. are, as far as practicable, to be generally examined. (b) Insulation resistance of the generators and switchboards (the both including those for emergency use) the motors and the cables are to be tested to ensure that they are placed in good order and to be adjusted if it is found not to comply with the requirements **2.18.1, Part 8.** However, where a proper record of measurements is maintained and deemed appropriate by the Surveyor, consideration may be given to accepting recent readings.
3 Refrigerating machinery	(a) Safety devices are to be generally examined to ascertain that they are placed in good order. (b) The machinery is to be examined while in operation to ascertain that there is no leakage of refrigerant.
4 Spare parts and associated fittings	Spare parts and their associated fittings for machinery are to be examined.
Requirements for Tankers	
1 Earthing	The earthing between cargo oil tanks or cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures is to be examined visually as far as accessible.
2 Electrical installations in hazardous areas	(a) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7, Part 8** is to be carried out. In addition, confirmation that the installations are in good order is to be made by measuring the insulation resistance. However, this measurement may be omitted at the discretion of the Surveyor, if accurate measurement records of the insulation resistance can be verified. (b) Performance tests of interlock devices associated with pressurized protected type electrical equipment and electrical installed in pressurized areas are to be carried out.

Table 5.26 Additional Requirements at Special Surveys

Items	Examinations
1 Speed governors, generator circuit breakers and associated relays	Performance tests are to be carried out with all generators operating under loaded condition, either separately or in parallel, as far as practicable.
2 Condensers, evaporators, and receivers	For those that use NH_3 *(R717)* as the refrigerant, the parts exposed to the primary refrigerant are to be tested at a pressure of 90% of the design pressure (the pressure may be reduced down to 90% of the setting pressure of the relief valves). However, the pressure, test may be replaced by other means as deemed appropriate by the Society.
3 All other piped machinery and parts not specified in -2 above	Pressure tests are to be handled in accordance with the requirements of **2.2.2(2)** where deemed necessary by the Surveyor.
4 Lighting systems, communication and signalling systems, and other electrical equipment	Performance tests (including operation tests) of interlocking devices used to ensure safe operation are to be carried out where deemed necessary by the Surveyor.

Table 5.27(1) Special Requirements for Ships Carrying Liquefied Gases in bulk

Items	Examinations
1 Cargo tanks	The following examinations are to be carried out [*1]: (a) An internal examination of all cargo tanks (b) A visual examination of insulation[*2] or cargo tank surface (if insulation is not fitted) Special attention is to be paid to chocks, supports, keys and other parts of the tank foundations. Removal of insulation may be required where deemed necessary by the Surveyor. (c) Thickness measurements for cargo tank plate (where deemed necessary by the Surveyor) (d) Non-destructive test for independent tank of Type *B* in accordance with the approved program This program is to be examined by non-destructive test on welded connections of the tank shell, main structural members and other parts liable to bear high stress[*3]. However, non-destructive testing for independent tanks of Type *C* cannot be dispensed with totally. (e) Leak test of all cargo tanks However, the leak test of membrane tanks, semi-membrane tanks and independent tanks below deck may be omitted, if it is verified by the log book or other proper means that gas detecting devices are in normal condition and no leak is recorded. Where there is any doubt on the integrity of any of the cargo tanks as a result of the examinations (a) through (e) above, the tank is to be tested under the pressures specified below. For independent tanks of Type *C*: Not less than 1.25 times maximum allowable design pressure (hereinafter referred to as *MARVS*) of pressure relief valves For independent tanks of Type *A* and *B* and integral tanks: Appropriate pressure according to the cargo tank design For independent tanks of Type *C*, either of the following test (i) or (ii) is to be carried out at every second Special Survey in addition to examinations (a) through (e). (i) Tests at a pressure 1.25 times *MARVS*, and thereafter, the non-destructive test stipulated in (d) (ii) Non-destructive test according to the program prepared for the cargo tank design[*4]
2 Holds spaces and secondary barriers	.Tank supporting and surrounding hull structures in hold spaces, secondary barriers and their insulation are to be visually examined. . For membrane containment systems, is to be verified that secondary barriers keep a specific level of tightness required in the system design in accordance with programs and acceptance criteria approved in advance. However, low differential pressure test are not to be considered an acceptable test for the tightness of secondary barriers. For membrane containment system with glued secondary barriers. If the verification results do nott satisfy the approved acceptance criteria, an investigation is to be carried. For other cargo containment system, in cases where there is any doubt about integrity of secondary barriers, the integrity is to be verified by pressure or vacuum test or other proper means.[*5]

Table 5.27(2) Special Requirements for Ships Carrying Liquefied Gases in bulk

Items	Examinations
3 Venting system for cargo tanks	Pressure relief valves for cargo tanks are to be overhauled, readjusted performance-tested and sealed. Pressure/vacuum relief devices and associated safety systems for interbarrier spaces and hold spaces are to be examined, overhauled and tested depending on their design.
4 Cargo and process piping	Examinations (a) and (b) are to be carried out. Removal of insulation may be required where deemed necessary by the Surveyor. (a) Where deemed necessary by the Surveyor; whole or a part of the valves and associated fittings are to be overhauled, or a pressure test at a pressure 1.25 times MARVS is to be carried out and after the pipes that were removed are reinstalled, a leak test is to be carried out. (b) Pressure relief valves are to be visually examined and whole or a part of these valves are to be overhauled, readjusted, performance tested and sealed.
5 Cargo handling equipment	Examinations and tests (a) through (c) are to be carried out (a) Cargo pumps, cargo gas compressors and gas blowers, and their prime movers are to be overhauled and performance tests for safety devices are to be carried out. Overhaul of electric motors as prime movers may be dispensed with[*6] (b) Heat exchangers, pressure vessels and evaporators are to be overhauled and pressure relief valves are to be performance tested, If an internal examination of vessels is impracticable, a pressure test of vessels and a performance test of pressure relief valves are to be carried out[*6] (c) The following tests (i) through (ii) are to be carried out for refrigerating equipment. (i) Overhaul of pumps and compressors and performance tests of pressure vessels such as condensers, evaporators, inter-coolers, oil separators and relief valves[*6] (ii) Leak test of pressure vessels and heat exchangers at a pressure of not less than 90% of the set pressure of relief valves (iii) Leak test of refrigerant piping system at a pressure of not less than 90% of the set pressure of relief valves
6 Emergency shutdown devices	For emergency shutdown valves, open-up examinations and leakage testing of valve seats are to be carried out.
7 Electrical installations in hazardous areas	Examinations specified in item 2 for tankers of Table 5.25 are to be carried out.

Note:

(*1) For membrane and semi-membrane tanks and internal insulation tanks, examination and testing are to be carried out in accordance with programs specially prepared according to approved methods for each tank system.

(*2) If visual examination of the insulation of tanks is impossible, the surrounding structural members are to be examined for cold spots when the cargo tanks are cooled. However, where integrity of cargo tanks and their insulation is verified by the cargo log book, the examination of cold spots may be omitted.

(*3) Parts liable to bear high stress:

- cargo tank supports and anti-rolling / anti-pitching devices
- web frames or stiffening rings
- swash bulkhead boundaries
- dome and sump connections to tank shell
- foundations for pumps, towers, ladders, etc.
- pipe connections

(*4) If an approved non-destructive test program does not exist, then a non-destructive test of at least 10 % of the length of the welded connections in each of the highly stressed areas below is to be conducted. This test is to be carried out from both inside and outside of the tank as appropriate and insulation is to be removed, as necessary.

- cargo tank supports and anti-rolling / anti-pitching devices
- stiffening rings
- Y-connections between tank shell and a longitudinal bulkhead of bilobe tanks
- swash bulkhead boundaries
- dome and sump connections to tank shell
- foundations for pumps, towers, ladders, etc.
- pipe connections

(*5) Appropriate pressure or vacuum tests and examination for cold spots are to be carried out. However, where integrity of insulation is verified by the log book, examination for cold spots may be omitted.

(*6) Equipment that has the open inspection at Planned Machinery Surveys need only be visually examined at Special Surveys.

Table 5.28 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

Items	Examinations
1 Insulation of cargo tanks	A general examination of the insulation is to be carried out. Where deemed necessary by the Surveyor, removal of the insulation may be required.
2 Cargo tanks foundations	A general examination of the foundations of cargo tanks including supports, keys and anti-rolling / anti-pitching devices is to be carried out. Where deemed necessary by the Surveyor, removal of the insulation may be required.
3 Sealing arrangement for tanks	A general examination of the sealing arrangement for tanks and tank covers penetrating decks is to be carried out. Where deemed necessary by the Surveyor, removal of the insulation or covers, or performance tests of the closing devices may be required.
4 Cargo pumps	Main parts of cargo pumps are to be opened up and examined.[*1]
5 Electrical installations in hazardous areas	Examinations specified in item 2 for tankers of **Table 5.25** are to be carried out.

Note:
(*1) Equipment that has the open inspection at Planned Machinery Surveys need only be visually examined at Special Surveys.

Chapter 6 DOCKING SURVEYS

6.1 Docking Surveys

6.1.1 Surveys in dry dock or on slipway

At Docking Surveys, examinations listed in **Table 6.1** are to be carried out in the dry dock or on the slipway after cleaning the outer shell.

6.1.2 In-water Surveys

1. In-water Surveys may be accepted in lieu of Surveys in the dry dock or on the slipway subject to prior approval by the Society. In any case, Surveys in the dry dock or on the slipway to be carried out at the times specified in **(1)** or **(2)** are not to be replaced with In-water Surveys. Except where expressly approved by the Administration, consecutive In-water Surveys should not be accepted in lieu of Surveys in dry dock or on slipway carried out at the times specified in **1.1.3-1(4);**

(1) Docking Surveys carried out at the times specified in **1.1.3-1(4)(a)** for the general dry cargo ships defined in **1.3.1(15)** and for ships with the class notation "*Enhanced Survey Programme*" (abbreviated to *ESP*).

(2) Docking Surveys carried out for ships with the class notation "*Enhanced Survey Programme*" (abbreviated to *ESP*), all of which are over 15 years of age.

2. The following plans and documents are to be included as part of a submission to the Society for approval for conducting In-water Surveys, which is to be obtained prior to commencement.

(1) Plans of shell plating below the waterline showing details of the location and sizes of shell openings, location of bottom plugs, location of bilge keels, location of water- and oil-tight bulkheads, location of welded seams and butts and location of anodes.

(2) Detailed information or drawings of constructions and arrangements indicated in **-3** below, together with their colour photographs, and detailed instructions for inspection of such constructions and arrangements.

(3) Documents showing the procedure which enables the Surveyor to confirm the clearance of the rudder bearing or the condition of the stern tube bearing based on a review of the operating history, the on board testing or analysis of sampled stern lubricating oil or lubricating fresh water.

Where the bearing is found to be satisfactory, special consideration may be given to the requirements in **-3(1)** or **-3(4)** below.

(4) Other data which may serve the inspections

3. Ships intended to be subjected to the In-water Survey are to comply with the following. Where the documents specified in **-2(3)** above are submitted, special consideration may be given to **(1)** or **(4)** below.

(1) A means of measuring the clearance of the rudder in way of each pintle is provided.

(2) Rope-guard ring plates are of such construction as to facilitate the inspection of the shafting between propeller hubs and stern frame boss.

(3) For water lubricated stern tube bearings, a means of measuring the clearance between the propeller shafts and their bearings is provided.

(4) For oil or freshwater lubricated~~ing~~ type stern tube bearings, a suitable means of ascertaining the performance of the stern tube bearings including oil sealing devices is provided.

(5) A suitable means of ascertaining the position and identity of each blade of the propellers is provided

(6) Hinged gratings are installed on all sea chests and constructed so as to facilitate opening and closing by the diver.(7) Markings indicating the position of longitudinal and transverse bulkheads and the names of interior spaces on the hull below the load water line, so that the diver is able to orient his/her position relative to the ship.

4. The Surveyor may require internal examinations or dry dock surveys where deemed necessary as a result of the In-water Survey.

6.1.3 Other Surveys

For each ship adopting the preventive maintenance system for propulsion shafting system in accordance with the requirements in **8.1.3**, general examination of the shafting system and review of all condition monitoring data available on board the ship on the system are to be carried out in order to ascertain that the system is well maintained.

Table 6.1 Requirements for Docking Surveys

tems	Examinations
1 Shell plating including keel plate, stem and stern frame	• Discontinuous structures, structural parts liable to excessive corrosion and openings in the shell are to be examined carefully. Grillage covers are to be removed where deemed necessary by the Surveyor.
2 Rudder	• The rudder is to be lifted or removed and visible parts of the rudder, rudder pintles, gudgeons, rudder stocks and couplings and stern frame are to be examined. Where applicable, a pressure test of the rudder according to **Table 2.1** may be required as deemed necessary by the Surveyor. The rudder bearing clearance is to be measured. The rudder may not require lifting or removal provided the Surveyor is satisfied with the condition of the rudder by measurement of the clearance.
3 Scupper, overboard discharges and sea inlets including distance pieces below freeboard deck,	• The main parts of valves and cocks are to be opened up and examined. The bolts or studs fastening these mountings to the hull are to be examined. The valves and cocks may not require open-up

and valves and cocks on shell plating, sea chest or distance piece	examination at the discretion of the Surveyor provided they were opened un and found to be in good order at the last Docking Survey. • In cases where consecutive In-water Surveys in lieu of Docking Surveys conducted in dry dock or on slipway may be applied with Administration approval, the open-up examination of valves and cocks require may be exempted at the discretion of the Society provided they were examined (including visual inspection by diver) and found to be in good order
4 After end of stern bush	• The wear down of the bearing is to be measured; or the clearance between the propeller shaft or stern tube shaft and the after bearing of the stern tube or the shaft bracket bearing.
5 Sealing devices for stern tube and shaft bracket bearing	• The efficiency of the oil gland is to be checked.
6 Propeller	• Propellers are to be examined. Where a controllable pitch propeller is fitted, the pitch control device is to be examined without dismantling.
7 Anchor, anchor chain, ropes, hose pipe, chain locker and cable clenches	• At the Docking Surveys carried out at the times specified in **1.1.3-1(4)(a),** anchor and anchor chains are to be ranged and all chains and chain related equipment are to be verified and externally examined. In cases where In-water Surveys in lieu of Docking Surveys conducted in dry dock or on slipway may be applied at the times specified in **1.1.3-1(4)(a),** anchor and anchor chains may not be required to be ranged and examined at the discretion of the Society provided they were examined (including visual inspection by diver) and found to be in good order. In such cases, anchor and anchor chains should be ranged and all chains and chain related equipment should be verified and externally examined at the next Docking Surveys conducted in dry dock or on slipway. At Special Surveys No.2 and subsequent Special Surveys, the diameter of the anchor chain is to be measured. If the mean diameter of a link, at is most worn part, is reduced by 12% or more from its required nominal diameter, it is to be renewed.
8 Tanks and spaces	• The internal examination, close-up surveys and thickness measurements (if applicable and not already carried out) are to be carried out as stipulated below. (i) At Docking Surveys in the dry dock or on the slipway carried out in conjunction with Special Surveys or at the times specified in **4.1.1-2**, at least the portions below the light ballast water line of the cargo holds/tanks and water ballast tanks (ii) At Docking Surveys carried out at the times specified in **1.1.6-5** as far as practicable.
9 Installations for In-water Surveys	• With regard to ships having the approval for conducting In-water Surveys based on the requirements in **6.1.2**, Surveyors are to confirm that the means and installations specified in **6.1.2-3** are in good condition.

Chapter 7 BOILER SURVEYS

7.1 Boiler Surveys

7.1.1 Surveys of Boilers and Thermal Oil Heaters

At Boiler Surveys, examinations specified in **Table 7.1** are to be carried out for boilers and thermal oil heaters.

7.1.2 Surveys of Steam Generators

Steam generators and other pressure vessels with steam accumulated in them are to be handled in accordance with the requirements for boilers.

Table 7.1 Requirements of Boiler Survey

Items	Examinations
1 Pressure parts of boilers	To be internally examined with the manholes, cleaning holes and inspection holes dismantled. Where considered to be necessary for external examination by the Surveyor, the parts are to be examined to the Surveyor´s satisfaction with the insulation around the parts removed.
2 Superheaters, economizers and exhaust gas economizers	To be examined internally and externally. For exhaust gas economizers of the shell type, all accessible welded joints are to be subject to a visual examination for cracking and non-destructive testing may be requested where deemed necessary by the Surveyor.
3 Combustion parts of boilers and thermal oil heaters(1)	The furnaces, combustion chambers, combustion gas chambers, etc. are internally examined with their doors opened.
4 Valves and cocks	The principal mountings and their fastening bolts or studs are to be opened up and examined.
5 Thickness of plates and tubes and size of stays	To be measured where deemed necessary by the Surveyor.

6 Safety valves and relevant parts of bailers, superheaters and thermal oil boilers(1)	The safety valves are to be adjusted under steam to a pressure not more than 103% the approved working pressure after the open-up examination. The pressure gauge used for this adjustment is to be calibrated properly. The relieving gears of the valves are to be examined and tested to verify satisfactory operation. However, for exhaust gas economizers, if steam cannot be raised at port, the relief valves may be set by the chief engineer at sea, and the results recorded in the logbook for review by the Surveyor. The general conditions of relief pipes for thermal oil heaters are to be examined. The popping pressure of safety valves fitted on thermal oil heaters is to be ascertained.
7 Safety devices, alarm devices and automatic combustion control devices	These devices are to be tested in accordance with the requirements in **Chapter 9, Part 7** of the Rules in order to ascertain that they are in good working conditions after the above examinations.
8 Review of the records of the logbook	Review of the following records since last boiler survey is to be carried out. (1) Operation (2) Maintenance (3) Repair history (4) Quality control of the feed water or thermal oil

Note:

1 Only applies to thermal oil heaters heated by fire, combustion gas or exhaust gas from machinery.

Chapter 8 PROPELLER SHAFT AND STERN TUBE SHAFT SURVEYS

8.1 Propeller Shaft and Stern Tube Shaft Surveys

8.1.1 Ordinary Surveys

At Ordinary Surveys of a propeller and stern tube shafts, the shaft is to be withdrawn for examinations specified in **Table 8.1**.

8.1.2 Partial Surveys

1. At Partial Surveys for propeller shafts Kind 1 of oil lubricated stern tube bearings, the examinations specified in the following **(1)** through **(3)** are to be carried out.

(1) Visual inspection of all accessible parts of the shafting system
(2) Verification that the main engines have not been operated within the barred speed range for torsional vibration.
(3) Examinations specified in 1, 4, 5, 6, 9 and 10 in **Table 8.1**

However, the requirements of 1, 5 and 6 in **Table 8.1** may be omitted for shafts having keyless propeller attachments or coupling flanges at their aft end, if general examinations are proved satisfactory.

2. At Partial Surveys for propeller shafts Kind 1C, the "Record for Monitoring System of Stern Tube Bearing and Oil Sealing Devices" is to be examined in addition to the examinations specified in **-1**.

8.1.3 Preventive Maintenance System

Notwithstanding the requirements in **8.1.1** above, where the ship is equipped with oil lubricated stern tube bearings and appropriate stern tube oil sealing devices as approved by the Society, and at least the following **(1)** through **(4)** are properly monitored and recorded for diagnosing the lubricating conditions of the shafting system and maintaining the system preventively based on the results of the diagnoses subject to approval of the Society; the survey items of -2, -3 and -5 in **Table 8.1** need not be complied with provided that all condition monitoring data taken according to the approved preventive maintenance system is found to be within permissible limits and a general examination of the shafting system is carried out. For a ship of which the preventive maintenance system has been approved by the Society, and the propeller shaft may be examined as a propeller shaft Kind 1C for the remaining requirements except -2, -3 and -5 in **Table 8.1**. The examination of the propeller boss bore in way of the propeller shaft taper section required by survey item -6 in **Table 8.1** may be partly dispensed with where deemed appropriate by the Society.

(1) Lubricating oil sampling and analysis is to be carried out regularly at intervals not exceeding 6 *months* and each analysis is to include the following **(a)** through **(d)** at least:
    (a) Water contents
    (b) Chlorides contents
    (c) Contents of shaft metal and bearing metal particles
    (d) Oxidation of oil

(2) Lubricating oil consumption rate

(3) Bearing temperature

(4) The value specified in -4 of **Table 8.1**

Table 8.1 Ordinary Surveys of Propeller Shaft and Stern Tube Shaft

Items	Examinations
1 Propeller connection (1) Shafts having keyed propeller attachments	The aft shaft taper is to be examined from the end of the cylindrical part of the shaft (or from the aft edge of the liner, if any) for one-third of the length of the shaft taper by an efficient crack detection method.
(2) Shafts having keyless propeller attachments	The forward portion of the aft shaft taper is to be examined by an efficient crack detection method. When the propeller is force fitted to the shaft, it is to be ascertained that the pull-up length is within the upper and lower limits given in **7.3.1-1, Part 7**.
(3) Shaft having coupling flange at the after end	The flange fillet and coupling bolts are to be examined by an efficient crack detection method. However, the crack detection examination may be dispensed with, provided that the Surveyor is satisfied with the condition after an external examination.
2 Propeller shaft, stern tube shaft, and coupling bolts	The sleeves, the fillet of the coupling flange to the intermediate shaft or to the stern tube shaft and the coupling bolts are to be examined with the shaft drawn from the stern tube bearings, However, coupling bolts are to be examined by an efficient crack detection method, in cases where Surveyors, based on the results of external examinations, deem such addition testing to be necessary. In addition, anti-corrosion covers are to be removed for shaft of Kind 2.
3 Stern tube bearing	The stern tube bearings are to be examined
4 After end of stern bush	The clearance between the propeller shaft or the stern tube shaft and the after bearing of the stern tube or the shaft bracket bearing or wear down of the bearing is to be measured.
5 Sealing device	Major parts of the stern tube sealing devices (including shaft bracket sealing devices, if any, hereinafter referred to as the same in this Chapter) are to be opened and examined.
6 Propeller boss	The propeller boss bore in way of the propeller shaft taper section is to be examined.
7 Controllable pitch propeller	The pitch control gear and working parts are to be examined and the propeller blade fixing bolts are to be examined by an efficient crack detection method.
8 Water lubrication line	Where water-lubricated stern tube bearings are adopted, the sea water piping for lubrication is to be examined.
9 Oil lubrication line	Where oil-lubricated stern tube bearings are adopted, the low oil level alarms of the lubricating oil tanks, oil temperature measuring devices and oil circulation pumps are to be examined.
10 Lubrication oil	Where oil-lubricated stern tube bearings are adopted, the lubricating oil record book is to be examined.

Chapter 9 PLANNED MACHINERY SURVEYS

9.1 Planned Machinery Surveys

9.1.1 Application

In a Planned Machinery Survey, surveys in accordance with the applicable requirements prescribed in 9.1.2 and 9.1.3 are to be carried out.

9.1.2 Continuous Machinery Survey

In a Continuous Machinery Survey (hereinafter referred to as "CMS" in this Chapter), every item specified in Table 9.1 is to be surveyed systematically, continuously and sequentially in accordance with the survey schedule table approved by the Society so that each survey interval for all CMS items may not exceed 5 *years*. During the CMS, when any defect or damage is found, similar machinery and equipment, or a part of them, may be required to be opened up for further examination as deemed necessary by the Surveyor, and all the defective items or failures found are to be repaired to the Surveyor´s satisfaction. Survey items deemed appropriate by the Society may be delegated to overhaul inspections by the shipowner (or the ship management company). In this case, the records of the overhaul inspections of the machinery and equipment concerned are to be ascertained as soon as possible. When it is regarded that satisfactory maintenance has not been carried out, an open-up examination in the presence of the Surveyor may be required.

9.1.3 Planned Machinery Maintenance Scheme

A ship owner (or ship management company) that has an established maintenance system may apply to adopt the planned maintenance method in which the shipowner is permitted to carry out planned overhaul inspections and maintenance as specified in **(1)** in place of the open-up surveys specified in Table 9.1. In addition to **(1)**, the ship owner (or ship management company) may apply to adopt the condition monitoring maintenance method as specified in **(2)** which is based on the results of condition monitoring and diagnoses for the machinery and equipment.

(1) The planned maintenance method is to be implemented in accordance with the machinery maintenance scheme approved by the Society. The Society will perform a general examination yearly on every item including review of the maintenance records in order to ascertain that the machinery and equipment covered are placed in good order. Where it is regarded that satisfactory maintenance has not been carried out for any of the machinery and equipment, an open-up examination of the item in the presence of the Surveyor may be required. For machinery and equipment deemed necessary by the Society, open-up examinations in the presence of the Surveyor are to be performed according to the survey schedule table based on the machinery maintenance scheme.

(2) The condition monitoring maintenance method is to be implemented in accordance with the machinery maintenance scheme approved by the Society. When any abnormalities are found through the condition

monitoring data or diagnoses, the shipowner (or ship management company) is to request an examination in the presence of the Surveyor as soon as possible in accordance with the survey schedule table based on the machinery maintenance scheme. The Society will perform a general examination yearly on every item including review of the condition monitoring data and the maintenance records in order to ascertain that the machinery and equipment covered are placed in good order. Where it is regarded that satisfactory maintenance has not been carried out for any of the machinery and equipment, an open-up examination of the item in the presence of the Surveyor may be required. The planned overhaul inspections and maintenance method is to be required where the condition monitoring maintenance method is not applied.

9.1.4 Periodical Surveys

In place of the Planned Machinery Surveys prescribed in **9.1.2** and **9.1.3**, the surveys specified in **Table 9.1** may be carried out at Special Surveys prescribed in **1.1.3** to ascertain that all the machinery is placed in good order.

However, at Special Surveys of ships equipped with two or more propeller shafting systems driven by identical main engines, surveys of the main engine components that were examined in accordance with the requirements for Special Surveys after the Classification Survey during Construction or the previous Special Survey may be omitted where deemed appropriate by the Surveyor, considering the time the engines were examined, the service history of the engines, the present condition and whether or not they were subject to a Classification Survey during Construction.

Table 9.1 Open-up Surveys of Machinery and Equipment

Items	Examinations
1 Diesel engines (main engine)	Cylinder covers, cylinder liners, pistons (including piton pins and pistons rods), crosshead pins and bearings, connecting rods, crank pins and their bearings, crank journals and their bearings, camshaft and their driving gears, turbo chargers, scavenge air pumps or blowers, air intercooler, attached essential pumps (bilge, lubricating oil, fuel oil, cooling water) are to be opened up.
2 Steam turbines (main engine)	Turbine rotors together with bearings, turbine casings, turbine and reduction gear couplings, nozzle valves and maneuvering valves are to be opened up.
3 Power transmission systems and shafting systems	• Reduction gears, reversing gears and clutch gears are to be opened up to the Surveyor´s satisfaction, and the gears, shafts, bearings and couplings are to be examined. • The essential parts of flexible couplings are to be opened up. • Thrust shafts, intermediate shafts and their bearings (excluding stern tube bearings and shaft bracket bearings) are to be examined by removing the upper bearing halves or their bearing metals and thrust pads and turning the shaft. • The essential parts of other power transmission gears are to be subjected to open-up examinations to the Surveyor´s satisfaction.
4 Auxiliary engines	Generators (including emergency generators), auxiliary engines driving auxiliary machinery essential for main propulsion and auxiliary machinery for maneouvring and personnel safety are to be handled in accordance with the requirements applicable to main engines.
5 Auxiliary machinery	The essential parts of the following auxiliary machinery are to be subjected to open-up examinations. (a) Air compressors, blowers (b) Cooling pumps (c) Fuel oil pumps (d) Lubricating oil pumps (e) Feed pumps, condensing pumps, drain pumps (f) Bilge pumps, ballast pumps, fire pumps (excluding those for emergency use) (g) Condensers, feed water heaters (h) Coolers (i) Oil heaters (j) Fuel oil tanks (k) Air reservoirs (including those for main, auxiliary, control, general service and emergency use) (l) Cargo piping systems)including bulk liquid cargo handling appliances as necessary) (m) Deck machinery (n) Distilling plants (for boiler used for driving steam turbines) (o) Other items considered to be applicable under the Planned Machinery Survey by the Society

Chapter 10 SURVEYS FOR STEEL BARGES

10.1 General

10.1.1 Scope

Surveys requirements specified in this Chapter are to apply to steel barges (hereinafter referred to as "barges"), notwithstanding the requirements specified in other chapters of this Part.

10.1.2 General Requirements on Surveys

1. The general requirements on Classification Survey during construction, Periodical Surveys, etc. are to follow the requirements specified in **Chapter 1.**

2. Notwithstanding the requirement in **-1** above, Periodical Surveys for barges not engaged in international voyages or those less than 24 *meters* in length are to comply with the following.

(1) Annual Surveys specified in **1.1.3-1(1)** are not required to be carried out.

(2) Intermediate Surveys specified in **1.1.3-1(2)** are to be carried out within three months (before or after) of the second or third anniversary date.

(3) Surveys other than Annual Surveys and Intermediate Surveys are to be carried out in accordance with the requirements in **1.1.3-1(3)** through **(5), -2,** and **-3.**

10.2 Classification Survey during Construction

10.2.1 General

In the Classification Survey during construction, it is to be confirmed that hull structure, hull equipment, machinery, fire protection, fire extinguishing systems, electrical installations, stability and load lines of the barge comply with the relevant requirements specified in **Part 13**.

10.2.2 Submission of Plans and Documents

1. Submission of plans and documents for approval

For barges subjected to Classification Survey during construction, the plans and documents listed in **2.1.2-1, -2, -3, -5, -7, -8, -9** which are related to the hull structure and equipment of the barge as well as the following plans and documents are to be submitted to the Society for approval.

(1) Skeg construction

(2) Construction of the joint between push boat and barge

(3) For barges required to have a loading manual in accordance with the requirements of **12.1.3 of Part 13**: the loading manual including the conditions for loading and other necessary information

2. Submission of plans and documents for reference

For barges subjected to Classification Survey during construction, the following plans and documents are to be submitted to the Society for reference in addition to the plans and documents for approval specified in **-1**.

(1) Plans and documents listed in 2.1.3 which are related to the hull structure and equipment of the barge

(2) Manuals for towing or pusher

(3) Calculation sheets of torsional vibration for generation shafting with a capacity not less than 30 *kw*

(4) Calculation sheets of battery capacity for navigation light

3. Submission of plans and documents other than those specified in **-1** and **-2** may be required where deemed necessary by the Society.

4. Notwithstanding the requirements in **-1** and **-2**, where hull structure or machinery of the barge is built at the same place of manufacturer based on plans and documents which have already been approved by the Society, part of those plans and documents specified in **-1** and **-2** may be omitted in accordance with the provisions specified elsewhere by the Society.

10.2.3 Presence of Surveyors

1. For barge hull construction and equipment, the presence of the Surveyor is required at relevant stages of the work in relation to the materials, structure and equipment as specified in 2.1.4-1.

2. For barge machinery, the presence of the Surveyor is required at the following stages of work notwithstanding the requirements in 2.1.4-2. Submission of the test data specified in 20.16.1-2, -4 and -5 of Part 13 may be required where deemed necessary by the Surveyor.

(1) When the tests prescribed in 20.16.1-1 of Part 13 for boilers and pressure vessels belonging to Group I or Group II are carried out.

(2) When the tests prescribed in 20.16.1-3 of Part 13 for the valves, cocks and distance pieces attached to shell plating are carried out.

(3) When the tests prescribed in 20.16.1-7 of Part 13 for the explosion-proof type electrical equipment are carried out.

(4) When machinery is installed on the barge.

(5) When the tests and trials prescribed in 20.16.2 of Part 13 are carried out.

(6) When the tests prescribed in 20.16.3 of Part 13 are carried out.

(7) When the tests for special machinery are carried out.

10.2.4 Hydrostatic Tests, Watertight Tests, and Relevant Tests

In the Classification Survey during construction, hydrostatic tests, watertight tests, and other relevant tests are to be conducted in accordance with the requirements specified in 2.1.5.

10.2.5 Sea Trials, Stability Experiments and Function Tests

1. In the Classification Survey during construction, sea trials specified in **2.3.1** may be omitted. However, for barges having unconventional construction or a special navigation system, sea trials may be required where deemed necessary by the Society.

2. Stability experiments are to be carried out in accordance with the requirements specified in **2.3.2**.

3. Loading tests are to be carried out in accordance with the requirements specified in **2.4.1.**

10.2.6 Finished Plans

At the completion of a classification survey during construction, the applicant is to prepare finished plans regarding the following drawings, and submit them to the Society.

(1) General arrangement

(2) Midship section, scantling plans (construction profile), deck plans, shell expansion, transverse bulkheads, plans for rudder and rudder stock, and plans for cargo hatch covers

(3) Bilge, ballast and cargo piping diagrams

10.2.7 Alteration of Registration Items

Alterations to registration items are to be surveyed in accordance with the requirements specified in **2.5.1.**

10.3 Classification Survey of Barges not built under Survey

10.3.1 General

1. In the Classification Survey of barges not built under the Society s survey, the actual scantlings of main structures of the barge are to be measured in addition to such examinations of the hull and equipment, machinery, fire protection and detection, means of escape, fire extinction, electrical installations, stability and load lines as required for Special Surveys corresponding to the barge s age in order to ascertain that they meet the relevant requirements in the Rules

2. For barges subject to the Classification Survey specified in **-1**, plans and documents specified in **10.2.2** are to be submitted to the Society as per barges subject to the Classification Survey during Construction.

3. Hydrostatic tests, watertight tests, and other relevant tests are to be carried out in accordance with the requirements specified in **2.2.2.**

4. Sea trials, stability experiments and loading tests may be dispensed with, where sufficient data on these tests are available, no alterations affecting the tests results have been made, and it is deemed appropriate by the Society.

10.4 Annual Survey

10.4.1 General

1. For survey items deemed necessary by the Society or the Surveyor, surveys equivalent to Special Surveys may be carried out.

2. Annual Surveys for machinery are not carried out.

10.4.2 Annual Survey for Hull, Equipment and Fire Extinction

At Annual Surveys for hull, equipment and fire extinction, surveys applicable to the barge s construction, equipment and fire extinction are to be conducted according to the requirements specified in **3.2**.

10.5 Intermediate Survey

10.5.1 General

For survey items deemed necessary by the Society or the Surveyor, surveys equivalent to Special Surveys may be carried out.

10.5.2 Intermediate Survey for Hull, Equipment and Fire Extinction

At Intermediate Surveys for hull, equipment and fire extinction, surveys applicable to the barges construction, equipment and fire extinction are to be conducted according to the requirements specified in **4.2.**

10.5.3 Intermediate Survey for Machinery

1. In the Intermediate Survey for machinery, open-up inspections of auxiliary generator engines, auxiliary machinery, heat exchangers and air tanks that are used as parts of important systems are to be carried out. These open-up inspections may be dispensed with, however, where it is verified that this machinery is in satisfactory condition as a result of a general examination and investigation of the maintenance records by the Surveyor.

2. Where the machinery specified in **-1** consists of duplicate systems, surveys for either of the machinery may be carried out.

10.6 Special Surveys

10.6.1 General

Commencement and completion date of the Special Survey is to be in accordance with the requirements specified in **5.1.1.**

10.6.2 Special Survey for Hull, Equipment and Fire Extinction

Special Surveys for hull, equipment and fire extinction are to be in accordance with the relevant requirements specified in 5.2 corresponding to the barge s structure, equipment and fire extinction.

10.6.3 Special Survey for Machinery

At Special Surveys for machinery, open-up inspections of auxiliary generator engines, auxiliary machinery, heat exchangers and air tanks that are used as parts of important systems are to be carried out. These open-up inspections may be dispensed with, however, where it is verified that this machinery is in satisfactory condition as a result of a general examination and investigation of the maintenance records by the Surveyor.

10.7 Docking Survey

10.7.1 General

For Docking Surveys of the barge, Docking Survey items related to barges in the requirements of **Chapter 6** are to be carried out.

10.8 Boiler Survey

10.8.1 General

Boiler Surveys are to be carried out in accordance with **Table 7.1**.

Chapter 11 REFRIGERATING INSTALLATIONS SURVEYS

11.1 General

11.1.1 Kinds of Surveys

Kinds of surveys are as follows:

(1) Surveys for classification (hereinafter referred to as Classification Surveys)

Classification surveys include the following:

(a) Classification Surveys during Construction

(b) Classification Surveys not built under the Survey

(2) Surveys for registration maintenance (hereinafter referred to as Registration Maintenance Surveys)

Classification Maintenance Surveys include the following.

(a) Special Surveys

(b) Annual Surveys

(c) Occasional Surveys

11.1.2 Classification Surveys and Intervals of Classification Maintenance Surveys

1. Classification Surveys

(1) Registration Surveys during Construction

Refrigerating installations intended to be constructed and registered with the Society under the survey by the Surveyors in accordance with the designs approved by the Society are to undergo the Classification Survey during Construction. The presence of the Surveyor is required at the following stages of the work.

However, except the case of thermal balance test specified in **5.2.6, Part 9** of the Rules, the requirements may be modified having regard to the actual status of facilities, technical abilities and quality control at the works.

(a) When the tests of materials in accordance with the requirements in **Part 10** and other tests necessary for the approval or acceptance described in **2.1.3-4**, **4.2.1-1** and **4.2.5, Part 9** of the Rules are carried out

(b) When materials are appropriated for parts, or when such parts are appropriated for the refrigerating installations concerned.

(c) When finishing an important part is completed, and if necessary, at a proper time during the middle stage of construction

(d) When the tests specified in **Chapter 5, Part 9** are carried out.

(2) Registration Surveys not Built under the Survey

Refrigerating installations intended to be registered in a way other than that described in **(1)** above are to undergo the Classification Survey when an application for the survey is made.

2. Registration Maintenance Surveys

Refrigerating installations which have been classifieds are to undergo surveys in accordance with the following intervals to maintain their classification

(1) Special Surveys are to be carried out at intervals specified in **1.1.3-1(3)**

(2) Annual Surveys are to be carried out at intervals specified in **1.1.3-1(1)**

(3) An Occasional Survey: At a time falling on any of **(a)** to **(d)** mentioned below, independently of special surveys and annual surveys

(a) When main parts of the installations have been damaged, repaired or renewed.

(b) When the installations are modified or altered.

(c) When it is considered necessary by the Society that an important part of the installation should be repaired at a time other than date for the special or annual survey.

(d) When a survey is needed for a reason other than the above.

11.1.3 Special Surveys and Annual Surveys Carried out in Advance, etc.

1. Surveys carried out in advance

The requirements for Special Surveys and Annual Surveys carried out in advance are to be in accordance with the provisions specified in **1.1.4**

2. Postponement of Special Surveys

The requirements for postponement of Special Surveys are to be in accordance with the provisions specified 1.1.5-1(1) or 1.1.5-1(2)

3. Partial Omissions of Surveys

At Special Surveys, the Surveyor may omit the thorough examination for items examined in accordance with the requirements for the Special Survey at the previous Annual Survey or Occasional Survey at his discretion.

4. Modifications of Surveys

At Special Surveys, the Surveyor may modify the requirements for cargo refrigerating installations specified in **2.3.1**, taking into account the size, purpose, construction, history, results of the previous Survey and the present conditions of the installations

5. Continuous Surveys

(1) For machinery and equipment approved to be applicable by the Society, where they are examined in regular rotation to complete all the requirements of the special survey within 5 *years* and the intervals of consecutive surveys of each item do not exceed 5 *years*, the examination of them in special surveys may be properly modified at the discretion of the Surveyor

(2) The survey in such way as specified in **(1)** above is referred to as a continuous survey.

11.1.4 Preparation for Surveys and Others

1. All such preparations as required for the survey to be carried out as well as those which may be required by the Surveyor as necessary in accordance with the requirements in the Rules are to be made by the applicant of the survey.

The preparations are to include provisions of an easy and safe access, necessary facilities and necessary records for the execution of the survey. Inspection, measuring and test equipment, which Surveyors rely on to make decisions affecting classification are to be individually identified and calibrated to a standard deemed appropriate by the Society. However, the Surveyor may accept simple measuring equipment (*e.g.* rulers, measuring tapes, and weld gauges micrometers) without individual identification or confirmation of calibration, provided they are of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces. The Surveyor may also accept equipment fitted on board a ship and used in examination of shipboard equipment (*e.g.* pressure, temperature or rpm gauges and meters) based either on calibration records or comparison of readings with multiple instruments.

2. The applicant for survey is to arrange a supervisor who is well conversant with the survey items intended for the preparation of the survey to provide the necessary assistance to the Surveyor according to his requests during the survey.

3. The survey may be suspended where necessary preparations have not been made, any appropriate attendant mentioned in the previous **-2** is not present, or the Surveyor considers that the safety for execution of the survey is not ensured.

4. Where repairs are deemed necessary as a result of the survey, the Surveyor will notify his recommendations to the applicant of the survey. Upon this notification, the repair is to be made to the satisfaction of the Surveyor

5. In cases where it is necessary to replace any fittings, equipment or parts, etc. used onboard, replacements are to comply with the regulations to be applied during ship construction. However, in cases where new requirements are specified or where deemed necessary by the Society, the Society may require that such replacements comply with any new requirements in effect at the time the relevant replacement work is carried out. In addition, replacements are not to use any materials which contain asbestos

11.1.5 Laid-up Ships

1. Laid-up ships are not subject to Registration Maintenance Surveys. However, Occasional Surveys may be carried out at the request of owners.

2. When laid-up ships are about to be re-entering service, the following surveys and surveys for specific matters which have been postponed due to being laid-up, if any, are to be carried out.

(1) If the due dates for Classification Maintenance Surveys have not transpired while the ship was laid-up, then an equivalent to the Annual Surveys specified in **11.3.2** is to be carried out.

(2) If the due dates for Classification Maintenance Surveys have transpired while the ship was laid-up, then Classification Maintenance Surveys are, in principle, to be carried out. However, in cases where Special Surveys and Annual Surveys are due, only the Special Survey may be carried out.

11.2 Classification Surveys

11.2.1 Classification Surveys during Construction

1. In a Classification survey during construction, the construction, materials, scantlings and workmanship of the refrigerating installation are to be examined in detail in order to ascertain that they meet the full requirements of each chapter concerned of the Rules.

2. The refrigerating machinery used in the refrigerating installation intended to be classified with the Society may be acceptable without their related tests by confirming the certificate issued by the Society.

3. For the refrigerating installation intended to undergo a classification survey during construction, the following plans and information in triplicate are to be submitted to the Society before the work is commenced.

(1) Specifications of the refrigerating installation (including particulars of refrigerating machinery units).

(2) Thermal calculation sheets.

(3) General arrangements of the refrigerating machinery (including detailed ventilating arrangements).

(4) Sectional assembly of refrigerant compressors and detailed plans (material to be indicated) of reciprocating compressor crankshafts, or rotors of screw type compressors, or rotors, discs and casings of turbo compressor and plans of speed-increasing gear.

(5) Detailed plans of pressure vessels subject to the primary refrigerant pressure (condensers, receivers, evaporators (brine coolers), oil separators, surge tanks, inter coolers, etc.).

(6) Piping arrangements of primary and secondary refrigerants and cooling water (materials, diameter and thickness of pipes are to be indicated).

(7) Arrangements of refrigerated chambers (including ductings for air circulation and ventilation).

(8) Wiring diagram for the refrigerating installation and arrangements of electric appliances.

(9) Wiring diagram in refrigerated chambers (including details of construction of penetration of the insulation).

(10) Kind of insulation on all surfaces, physical properties, thickness and methods of attachment of the insulation and linings (including detailed construction and insulating methods of hatch covers, access doors, ventilating ducts, scupper and bilges).

(11) Drainage arrangements and defrosting arrangements in refrigerated chambers and spaces in which the air coolers are installed

(12) Arrangements of thermometers or sensors in refrigerated chambers and air coolers, and the name of manufacturer and the type of the sensors are to be informed.

(13) Explanatory documents to show the function of automatic temperature controls.

(14) Heat balance tests and measuring plans (performance diagrams of compressors, fans, and their driving motors are to be submitted as well).

(15) Other documents considered necessary by the Society.

4. Notwithstanding the requirements in **-3**, submission of some of the plans and documents specified in **-3** may be omitted, in case where the refrigerating installation are intended to be constructed at the same manufacturer s work based on the plans and documents which have been approved by the Society.

11.2.2 Classification Surveys not built under Survey

1. General

In a Classification Survey not built under survey, the refrigerating installation is to be examined on their construction, materials, workmanship and actual conditions as required for the special survey corresponding to their age, in order to ascertain their effectiveness.

2. Tests

In the Classification Survey not built under survey, operation tests and other various tests are to be carried out in accordance with the requirements in **Chapter 5, Part 9**. However, the heat balance test may be replaced with other test or omitted where the Surveyor approves it.

3. When a refrigerating installation is intended to undergo the Classification Survey not built under survey, plans and documents are to be submitted as may be required by the requirements in **11.2.1**.

11.3 Classification Maintenance Surveys

11.3.1 Special Surveys

At a special survey, the examinations required by the following **(1)** to **(18)** are to be carried out.

(1) An examination of the refrigerating installation log book is to be made to trace the operating condition of the installation during navigation.

(2) Insulation linings and their fastening are to be examined. Any indication of dampness or deterioration of the insulation is to be investigated.

(3) Air circulation ducts, hatch covers and their seal, access doors and their fastening, ventilating system and their closing means are to be examined. Care is to be given to the condition of penetrating parts where ducting or ventilating pipes pass through the deck plating.

(4) Bilge ways, wells, strainers, suction and sounding pipes, scupper pipes together with non-return valves and water sealed traps fitted to them are to be cleaned and examined. Air cooler defrosting arrangements and their drainage arrangements are also to be examined.

(5) Condition of air coolers cooling coils, cooling grids (including brine) in refrigerated chambers is to be examined.

(6) Shells of condensers, receivers, evaporators, separators, driers, filters and other pressure vessels exposed to the primary refrigerant pressure, and their connections and piping are, as far as possible, to be examined externally.

(7) Insulation on the surfaces of pressure vessels, pipe connections and piping is to be examined for dampness or deterioration.

(8) Reciprocating compressors with their lubricating system are to be opened up and examined. In the case of screwed-type compressors or compressors deemed appropriate by the Society, the interval of opening up may be modified by the Society, provided their working condition is found satisfactory.

(9) Condenser cooling water pumps, primary refrigerant pumps and brine pumps are to be opened up and examined.

(10) Insulated pipes carrying the refrigerant are to be examined both outside and inside the insulated chambers, removing the insulation to the extent necessary for checking their condition, especially of the locations in which pipes are connected by butt welding in place or screwed couplings.

(11) All pressure relief valves throughout the refrigerating plant are to be adjusted on their relieving pressures.

(12) All automatic controls, safety devices and alarms are to be tested for their satisfactory function.

(13) Randomly selected thermometers and apparatus used for measuring the temperature in the chambers and of air in suction and delivery main stream are to be checked for their accuracy.

The Surveyor may at his discretion accept the checking records made by some reliable persons.

(14) The insulation in refrigerated chambers is to be carefully examined, and bored where considered necessary in order to determine the integrity and dryness. These test holes are subsequently filled carefully.

(15) Brine pipe system is to be tested to a pressure of 1.5 times the design pressure or 0.4*MPa* whichever is the greater.

(16) Pressure vessels are to be opened up for examination, and afterward pressure tested in accordance with the following procedures:

(a) The coils of gas condensers of the coil-in-casing type are to be examined and tested to a pressure of 1.5 times the high pressure side design pressure. Where it is impracticable to remove the coils they may be examined through inspection holes and tested in place.

(b) The coils of evaporators of the coil-in-casing type are to be examined and tested to a pressure of 1.5 times the low pressure side design pressure. Where it is impracticable to remove the coils, they may be examined through inspection holes and tested in place.

(c) Gas condensers of the shell-and-tube type and gas evaporators (brine coolers) of the shell-and-tube type in which the primary refrigerant is in the shell, are to have the water or brine end covers removed and the tube plates, tube ends and inside the end covers examined. Afterwards, the shells are to be tested to a pressure equal to the high pressure side design pressure.

(d) Gas evaporators (brine coolers) of the shell-and-tube type in which the brine is in the shell are to have the primary refrigerant end covers removed and the tube ends and inside the end covers examined. The shells are to be tested to a pressure of 1.5 times the design pressure or 0.4*MPa* whichever is the greater. After refitting the end covers, the primary refrigerant side is to be tested to a pressure equal to the low pressure side design pressure.

(e) Primary refrigerant receivers are to be hydrostatically tested at the design pressure of the high pressure side.

However, when the receivers are designed to use such primary refrigerant as *R*22, *R*134*a*, *R*404*A*, *R*407*C*, *R*410*A* or *R*507*A*, or when they are proved to have no harmful defects such as erosions or cracks on the inner surface of the vessels by means of ultrasonic test or other effective non-destructive examinations, the above mentioned pressure test may be omitted.

(f) For pressure vessels for the refrigerant of *R*22, *R*134*a*, *R*404*A*, *R*407*C*, *R*410*A* or *R*507*A*, pressure tests specified in **(a)** through **(e)** above may be omitted at the first Special Survey provided that the vessels are found to be in good order.

(17) Current condition of the electrical equipment and electric cables are to be examined. It is to be ascertained that their insulation resistance is not less than 100,000 Ω between all insulated circuits and earth. When correct records are maintained, the above examination may be omitted at the discretion of the Surveyors.

(18) Operation tests of the refrigerating installation are to be carried out.

11.3.2 Annual Surveys

At an annual survey, an external examination is to be carried out on the following items **(1)** to **(5)**.

Examination may also be made on the items which are prepared to be examined in detail or which are opened up by the Owners option. If any defects are observed at such examinations, the Surveyor may require open-up examinations of the suspected items.

(1) Items required in **(1)** through **(7)**, and **(13)** in **11.3.1** are to be examined.

(2) Compressors, condenser cooling water pumps, primary refrigerant pumps, brine pumps, air circulation fans and their driving motors are to be examined externally.

(3) Water end covers of condenser(s) selected by the Surveyor are to be examined externally for corrosion through inspection holes or other suitable openings.

(4) Tests for insulation resistance are to be made on the motors and controls of compressors, pumps, fans, etc. and their wiring, and the resistance is to be not less than 100,000 Ω between insulated circuits and earth. However, when correct records are maintained, the above tests may be omitted at the discretion of the Surveyor.

(5) Random tests are to be made to ascertain that the automatic controls, safety devices and alarms are in good working condition.

11.3.3 Occasional Surveys

At an occasional survey, examinations or tests on items required are to be carried out in accordance with the requirements in **11.1.2-2(3)**, to the satisfaction of the Surveyor.