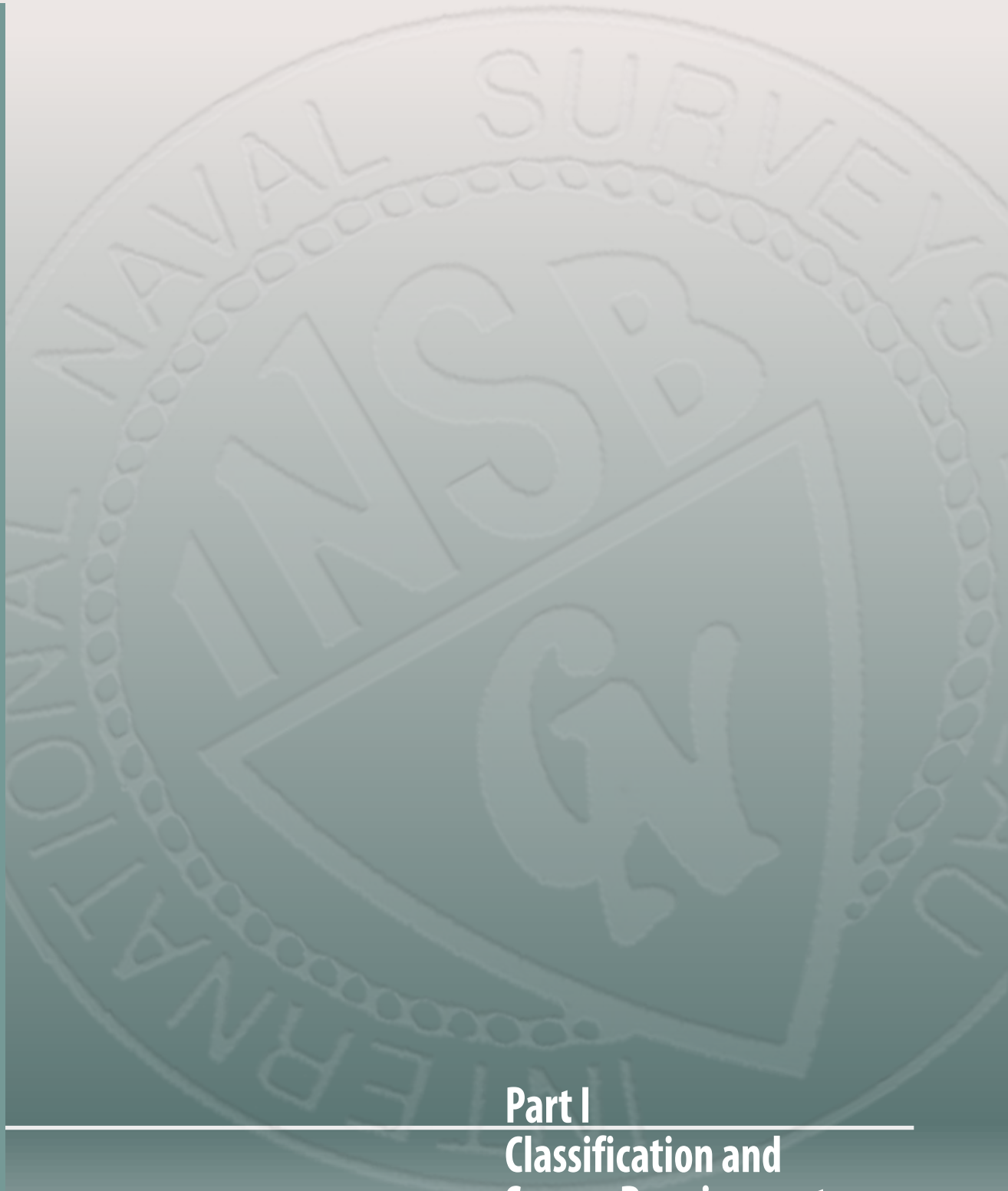
INSB Rules and Regulations for the Classification and Construction of Steel Ships

January 2014



Part I
Classification and Survey Requirements

INSB RULES- PART I

Record of amendments

No.	Identification number of amendment / Items amended	Date of approval
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SECTION 1
General

1.1 I.N.S.B. profile

1.1.1 The **International Naval Surveys Bureau SA-I.N.S.B.**, hereinafter referred to as ***I.N.S.B.***, ***the Bureau*** or ***the Society***, is an independent a Greek Non-Governmental ship's Classification Society, founded under the legal form of a Societe Anonyme (S.A.),

1.1.2 The I.N.S.B. Head Office is based in Piraeus while its legal address is at 8, Kantharou & Sachtouri Street 185 37 Piraeus, Greece.

1.1.3 The Society's services include:
(a) Classification and technical assessments of ships under construction and ships in service,
(b) Statutory survey and certification activities, on behalf of Flag States having authorized the society, on a worldwide scale via an approved network of survey stations and surveyors/auditors.
(c) Providing other technical inspections and engineering services as required.

1.1.4 I.N.S.B. aims to provide impartial and integral classification and statutory services to ships and offshore installations, for the promotion and safeguarding of the safety of life and property at sea and for the prevention of pollution to the marine environment, under its capacity as a Classification Society and a Recognized Organization (RO) / Recognized Security Organization (RSO).

1.1.5 The right of interpretation of the I.N.S.B. Technical Rules rests with the Society alone. The respective latest version of the society General Terms and Conditions as well as corresponding technical norms are applicable to all services rendered by the society, including services rendered under the Society's statutory functions.

1.2 Application of the Rules

1.2.1 The present *Rules and Regulations for the Classification of Steel Ships* apply to steel ships both under construction and/or in service.

1.2.2 The Society will consider alternatives to the provisions of the Rules if it can be demonstrated, through satisfactory service experience or sound engineering analysis, to be equivalent to the overall strength and safety standards set forth in the Rules.

1.3 Definitions and explanations

1.3.1 For the purpose of the Rules and Regulations, the following definitions will apply:
Interim Certificate of Class: A Certificate issued immediately upon completion of surveys to enable the vessel to trade while the reports of Class Surveys are processed by the Society pursuant to issuing her a full term Certificate of Class.
Passenger: A person other than the Master or a member of the crew or other persons employed in any capacity on board a ship on the business of that ship, or a child under one year of age.
Recognized Organisation or **Society:** A Classification Society, which is a member of IACS, or society with which the I.N.S.B. has an agreement for mutual recognition or representation, or other society which is approved by the flag Administration that the vessel is registered.

1.3.2 The following explanations are to be taken into account:
CSH and ***CSM*** mean *Continuous Survey Hull* and *Continuous Survey Machinery*, respectively.
The Rules are the present *Rules and Regulations for the Classification of Steel Ships*.

1.4 Acceptance of surveys held by other Organisations

1.4.1 The Society may accept surveys carried out by recognized Classification Societies and Certificates issued.

1.4.2 The Society may accept surveys carried out by Administrations or an Organisation recognized by them, as well as the Certificates issued. In such a case the pertinent documents are to be submitted to the Society.

Novel features

1.5.1 Ships, the construction of which involves novel features of design in respect of hull, machinery or

equipment, and to which the provisions of the Rules do not apply directly, may be granted the I.N.S.B. Class upon approval by the Society, on the basis that the provisions of the Rules have been met insofar as practicable, and that a special consideration, based on the best information available at the time of build, has been given to the novel features.

1.6 Changes to the Rules

1.6.1 Whenever deemed necessary or justified, the Society may modify the provisions of the present Rules and Regulations, lay down new ones or change their application.

1.6.2 Changes to the Rules become applicable to ships, the contract for which is signed 3 months after their publication. However, the Society may, when necessary, decide upon an earlier implementation date.

1.6.3 Implementation of changes to the Rules before their effective date may also be requested by the Owner or the party applying for classification.

1.7 Application of the Rules to existing ships

1.7.1 The implementation of all changes to the Rules - except those concerning Surveys - to already classed ships or to ships the contract for which has already been signed at the time of entry into force is not required, unless deemed necessary by the Society. Special consideration will be given to ships transferring class to I.N.S.B. from a recognized Society.

1.8 Provisions of International Conventions and National standards

1.8.1 The relevant requirements of the International Conventions in force are taken into account in the present Rules.

1.8.2 National Codes and standards may, upon specific agreement with the Society, be accepted as alternatives to the provisions of the Rules, on the condition that they may be proved equally effective.

1.9 References in the Rules

1.9.1 For cross-references in the text of the Rules and Regulations, the following abbreviations and definitions have been adopted:

Pt **:** Part
Ch **:** Chapter
Sec **:** Section
Subs **:** Subsection
Tit **:** Title or header, a division of a Subsection encompassing several paragraphs. It will be numbered with 3 groups of Arabic numerals in bold type.
para **:** Paragraph (numbered with 3 or 4 groups of Arabic numerals).
subpara **:** Subparagraph (marked with smallcase Latin letters in parentheses).
item **:** A division of a subparagraph (denoted with smallcase Roman numerals in parentheses).
subit **:** Sub-item, a division of an item. Preceded by a long or em-dash (−).
fig **:** Figure or drawing.

19.2 References to numbered divisions of the Rules' text will be in Italic type.

1.9.3 References will be made from the greater text subdivision to the lesser, for example: "See *Ch 3, Sec2*".

1.9.4 References will be made in the following manner:
(a) Within the same Part, reference will begin with the Chapter number: "See *Ch 3 para 2.1.4*".
(b) Within the same Chapter, reference will begin from the paragraph or the greatest text division whose requirements are referred to: "See *para 5.6.3*" or "See *Sec 9*".
(c) The figures and tables will be numbered according to the paragraph they relate to. In case a figure or table is applicable to more than one paragraph, it will have the number of the first paragraph to which it relates.

1.9.5 **Condensed references** may be used, for example: in lieu of "See *Pt II Ch 3 para 1.2.1*", reference may be: "See *Ch II-3/ 1.2.1*".

1.9.6 References to documents such as I.N.S.B. Certificates, IMO Regulations, etc., will be made in Italic type whenever the official title or name of the document is involved.

SECTION 2
Legal matters

2.1 Liability of I.N.S.B.

2.1.1 Whilst the Society, it's officers, employees, agents, surveyors/auditors, use their best endeavours to ensure that the functions of the Society are properly carried out , in providing services, information, or advice , neither the Society nor any of its officers, employees, agents, surveyors/auditors warrant the accuracy of its rendered services, advice supplied or information.

2.1.2 Except as set out herein, neither the Society nor any of its officers, employees or agents shall be liable for any loss, damage or expense whatever sustained by any person due to any act, omission or error of whatever nature and howsoever caused by I.N.S.B., its officers, employees or Agents or due to any inaccuracy of whatsoever nature and howsoever caused by any information or advice given in any way whatsoever by or on behalf of I.N.S.B., even if held to amount to a breach of warranty. Nevertheless, if any person who is a party to an agreement pursuant to which I.N.S.B. provides any services, uses I.N.S.B. services or relies on any information or advice given by or on behalf of I.N.S.B. and suffers loss, damage or expense which is proved to have been due to any negligent act, omission or error of I.N.S.B., its officers, employees or agents, or any negligent inaccuracy in information or advice given by or on behalf of I.N.S.B., then the Society will pay compensation for his proved loss up to, but not exceeding the amount of the fee (if any) charged by I.N.S.B. for that particular service, information or advice.

2.1.3 The Society, its officers, employees or agents (on behalf of each of whom this notice is given) shall be under no liability or responsibility in negligence or otherwise howsoever to any person who is not a party to the agreement with I.N.S.B. pursuant to which any certificate, statement, data or report is issued in respect of any information or advice expressly or impliedly given by I.N.S.B. or in respect of any omission or inaccuracy therein or in respect of any act of omission which has been caused or contributed to any certificate, statement, data or report being issued with the information and advice it contains (if any).

2.1.4 Any notice of claims for loss, damage, or expense s referred to in paragraphs 2.1.2, 2.1.3 shall be made in written to the I.N.S.B. head office within three (3) months from the date when the particular service, information or advice was first provided.

2.1.5 Failure to present any claims as above to the Society in written and within the three (3) months period, any and all of such claims will be deemed as to have been waived and the Society shall be relieved and discharged from all liabilities.

2.2 Jurisdiction and Governing law

2.2.1 The place of jurisdiction for any legal action against I.N.S.B. is Piraeus. At the option of I.N.S.B. it may be the place of competence for the third party's residence.

2.2.2 The governing law is the Greek law.

2.3 Confidentiality

2.3.1 Subject to any obligation to the Flag State Authorities, the Society will treat as confidential any documentation related to classed vessels and vessels undergoing classification

2.3.2 Documentation concerning classed vessels or vessels under classification may be passed unto third parties solely with the written consent of the party entitled thereto.

2.3.3 However, the aforementioned duty of confidentiality shall not apply to the extent that there is a duty to disclose according to the applicable law or where disclosure is made to a person professionally bound by a duty of confidentiality. Further, the aforesaid duty of confidentiality shall not apply to the obligations that the Society may have towards international organisations, Flag Administrations or under a court order or by law or arising out of international conventions.

2.3.4 In addition, it is hereby noted the below information is considered public information and available for any interested party:

(a) Information published into the society's Register of Ships;
(b) Due dates of periodical class surveys ;
(c) Information on transfers, suspensions or withdrawal of class, including overdue surveys, overdue recommendations, operating conditions or restrictions.

2.4. Independence of I.N.S.B.

2.4.1 The Society shall be independent to the extent that is required with regard to the conditions under which it performs its services.

2.4.2 The society and its officers, employees, representatives, surveyors and staff shall not be affected by the designer, manufacturer, supplier, installer, purchaser, owner, user or maintainer of the item subject to the Society's delivered service and shall perform fairly from independent position.

2.4.3. The Society and its personnel shall not engage in any activities that may conflict with their independence of judgment and integrity in relation to their service activities.

2.4.4. All potential clients shall have access to the services of the Society. There shall not be any undue financial or other conditions.

SECTION 3
Financial matters

3.1 Fees

3.1.1 For services rendered by the Society, fees are to be paid in accordance with the tariff of I.N.S.B. or on the basis of the price quoted in the offer.

3.1.2 In addition to the aforesaid, I.N.S.B. will charge any extra expenses incurred in connection with the services rendered (e.g.: accommodation, transportation expenses and surveyor fees).

3.2 Additional expenses

3.2.1 Additional expenses which are incurred as a result of poor or incomplete planning, lack of organisation or other causes attributed to the client and for which the I.N.S.B. is not responsible will be charged separately at the respective cost rates.

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Section

1 General provisions

2 Classification procedure

3 Transfer of class

4 Suspension and withdrawal of class

5 Frequency of surveys and tests

6 Class notations

7 Survey planning, preparation and performance

SECTION 1
General provisions

1.1 Scope of classification

1.1.2 Classification covers the ship's hull and machinery, including equipment and electrical machinery.

1.1.2 Classification activities are performed in accordance with the provisions of the present Rules and Regulations and any other applicable Rules and Guidance Notes, published by the Society.

1.1.3 Upon application certain installations – such as refrigerating installations - may be classed separately.

1.1.4 The Society reserves the right to extend the scope of classification to all equipment and machinery used in the operation of the ship which, due to their character and/or arrangement may impair the safety of human life, of the ship and her cargo or of the environment.

1.1.5 The provisions set forth in the present Rules and Regulations, including those related to the assignment, confirmation, renewal or reinstatement of class will apply to ships loaded and operated in a proper manner by a qualified and competent crew or operating personnel, in accordance with the environmental, loading, operation and other criteria on which classification is based.

1.2 Certificates of Class

1.2.1 The assignment of class, classification characters and notations, which denote the degree of confidence that the ship has, are assigned following the satisfactory completion of Surveys, carried out by the Society's Surveyors and the verification of compliance with the Rules.

1.2.2 When the required reports on completion of the survey of new or existing ships submitted for classification have been received and duly approved, a **Certificate of First Entry of Classification** will be issued to Owners or Builders.

1.2.3 Classed ships will be granted a **Certificate of Class** with the corresponding class notations, valid for 5 years and subject to endorsements for Annual and Intermediate Surveys.

1.2.4 Surveyors to the I.N.S.B. are entitled to issue **Interim Certificates of Class** to enable a ship classed with the Society to continue her voyage or service (for fixed or tethered ships). Such Certificates are in all cases subject to the instructions by the I.N.S.B. Head Office.

1.2.5 Classed ships will be entered in the *Register Book* with the corresponding class notations.

1.3 Validity of class

1.3.1 The duration of the class period (validity of class) will be five years, subject to endorsements as stated in *regulation 1.2.3*. The hull, machinery and any classed special equipment will have the same period of class.

1.3.2 The class will continue to be valid provided that the hull, machinery, and equipment satisfactorily undergo the surveys prescribed by the Rules and provided that repairs required are carried out, to the satisfaction of the Society.

1.3.3 Upon completion of the Special Survey a new class period will be assigned to the ship and a new Certificate of Class will be issued to the Owners.

1.4 Attestation of Class

1.4.1 Upon request by the Owners, an **Attestation of Class** may be issued by the Society based on the information in the ship's records as kept by the Society at the time of issuance of the Attestation. This Attestation may be cancelled in case new information not available at the time of issuance should arise or be revealed later on which have not allowed the Society to issue the requested Attestation.

1.4.2 Attestation is drawn whereby I.N.S.B., upon becoming aware of a breach in its Rules, is empowered to suspend class from the date the breach was made, which may be prior to the date of the attestation.

1.5 Expiry of class

Where hull and machinery are found to no longer comply with the requirements of the Rules or any conditions on which class assignment was based, or where Owners refuse to have repairs or modifications required by I.N.S.B. carried out within a period to be determined for each particular case, the vessel's class will cease to be valid. The same applies to the class of special equipment.

1.6 Register of ships

1.6.1 A Register of ship shall be printed annually and may contain the name of the ships, brief identification data including IMO NR, I.N.S.B. NR, TYPE OF SHIP as well as character of class notations assigned together with other useful data for ships classed with the Society.

1.7 Port State Control (PSC)

1.7.1 In case of ship(s) detention by a Port State Control Authority affecting vessel's class, the ship managers or operators are obliged to notify the Society to enable vessel's attendance with undue delay.

1.7.2 Vessels which have been identified by the Society to require special attention based on multiple risk criteria, recent history of the vessel such as Port State Control (PSC) records, detentions, survey status, conditions of class, recommendations etc. , can be subject to additional

surveys & attendance by the Society over and above the normal classification surveys.

1.7.3 Within the efforts of the Society aiming for improving fleet quality and safety and reducing the risk of Port State Control (PSC) detentions, when so required, the Society's surveyors are to be given necessary access to the ship, for identification of possible areas of deficiencies and recommendation of repairs.

1.7.4 Deficiencies which require immediate attention as indicated by the Surveyor are to be rectified promptly and thoroughly to the satisfaction of the attending Surveyor.

SECTION 2
Classification procedure

2.1 Application for classification

2.1.1 Application for classification is to be submitted in written to the I.N.S.B. Head Office by the Builder, the Owner, or his appointed representative. Also, applications or inquiries for INSB Services can be routed to the Society's Head Office via the society's network stations and/or representatives.

2.1.2 Applications for the classification of ships are to be accompanied, at least, by their general particulars. The Society reserves the right to request submission of additional particulars.

2.1.3 In case of transfer of class the previous class status, as well as any recommendations made by the previous Classification Society are to be submitted when application for classification is filed.

2.2 Classification of ships built under I.N.S.B. survey

2.2.1 New steel ships are to be built under Special Survey in accordance with the Rules. The constructional plans and all necessary particulars of the ship's hull, machinery and equipment are to be submitted for the approval of the Society before the work is commenced. Subsequent modifications of these plans are also to be submitted for approval.

2.2.2 Copies of the approved plans showing the ship as built, as well as essential Certificates, records and reports, Loading and other Manuals are to be readily available for the use as required by Surveyors to I.N.S.B. and may be required to be kept on board the ship in service.

2.2.3 Materials used for the construction of the hull and machinery submitted for classification are to be of good quality and tested for compliance with the Rules. Steel is to be manufactured at works recognized by the Society or alternatively is to be tested to demonstrate its suitability.

2.2.4 As a rule, the machinery, boilers, auxiliary installations and equipment, intended for ships built under survey are also to be built under Special Survey. However, when the machinery, boilers, auxiliary installations and equipment are not built under Special Survey, they will be subjected to a special examination by the Society.

2.2.5 From the commencement of the works until the completion of the ship and final test of the machinery under working conditions (sea trials) the Surveyor is to examine materials, workmanship and arrangements. In case any item is found not to be in accordance with the Rules, or the approved plans or any material, workmanship or arrangement found to be unsatisfactory, it is to be rectified.

2.2.6 As far as practicable, machinery and equipment will be subjected to operational trials on the Manufacturer's test bed to the scope specified in the Rules. The same applies also to engines produced in large series.

2.2.7 When the machinery, equipment or electrical installations are novel in design or have not yet proved their efficiency under actual service conditions on board ships, I.N.S.B. may require performance of a trial under particularly severe conditions.

2.3 Date of completion

2.3.1 The date of completion of the Special Survey during the construction of ships built under I.N.S.B. survey will be taken as the date of the last survey carried out during the construction or trials of the ship.

2.3.2 The date of completion of the Special Survey will normally be taken as the date of build to be entered in the *Register Book*. When the period between completion and commissioning unduly extends, the dates of completion and commissioning will be indicated separately.

2.4 Ships classed with a recognized Society

2.4.1 For ships already classed with a recognized Society that are submitted for classification with I.N.S.B., the procedure stated in *Sec 3* for the Transfer of Class will apply.

2.5 Ships without a class and ships not built under survey by a recognized Society

2.5.1 For ships without a valid Certificates of Class the drawings and other particulars relevant to classification are to be appraised for compliance with the I.N.S.B. Rules for construction and/or other equivalent Rules.

2.5.2 For admission to class, the ship and/or her special equipment are to be surveyed in accordance with requirements for a Special Survey appropriate to the age and type of ship, along with Docking and Tailshaft Surveys at the discretion of I.N.S.B.. If results of surveys are satisfactory, the I.N.S.B. class will be effective as of the date of completion of the survey.

2.5.3 Plans and documents to be submitted for classification are listed under *Subs 3.4 – 3.7*. Any additional documents may be considered necessary and will be specifically requested.

2.5.4 For ships not built under a recognized Classification Society, longitudinal strength calculations, local strength calculations, equipment number computation and load line calculation are to be carried out before the classification surveys are commenced.

SECTION 3
Transfer of class

3.1 Purpose

3.1.1 The purpose of this Section is to ensure that the Society accepts the vessel for classification only after all overdue surveys, recommendations and conditions of class previously issued to the vessel have been complied with, as specified by the transferring Society. Similarly, the Bureau has to ensure that recommendations and conditions of class previously issued to the vessel by the transferring Society but which are not yet due are carried out as specified by the transferring Society.

3.2 Procedure for the transfer of class

3.2.1 Whenever I.N.S.B. is requested by an Owner to accept an existing vessel into class, the Society is to immediately notify the Owner in writing the following:

(a) An **Interim Certificate of Class** may be issued only after all overdue surveys have been satisfactorily completed and all overdue recommendations and conditions of class previously issued to the vessel have been completed as specified by the previous Society.
(b) Any remaining recommendations and conditions of class are to be dealt with by their due dates.
(c) Principles given in *subparas (a)* and *(b)* above apply to any additional recommendations or conditions of class issued to the vessel arising from surveys, which were not included in the initial Survey Status provided to the Society because these surveys were carried out in close proximity to the request for the transfer of class. Such additional recommendations or conditions of class - if received after the issuance of the Interim Certificate of Class by I.N.S.B. and which are overdue - are to be dealt with at the first port of call.

3.2.2 Owners/Managers are to produce documentary evidence of the surveys held by the previous Society as follows:

(a) Along with the class entry or application:
  (i) The current **Classification Survey Status** (including recommendations, if any) of the previous Society.
  (ii) Updated CSH and CSM lists, if hull and machinery were previously under Continuous Survey.
  (iii) Certificates of Class, even if expired.
  (iv) Statutory Certificates, even if expired.

(b) Prior to the issue of an Interim Certificate of Class:
  (i) Ultrasound gauging measurement report.
  (ii) Anchor chain calibration report.
  (iii) Megger test report.
  (iv) Main engine crank shaft deflection report.
  (v) Propeller shaft and rudder stock/shaft clearances.

3.2.3 Upon receipt of a written request by an Owner for the transfer of class, the Society may utilize the transferring Society's survey status information provided by the Owner and, after compliance with the relevant requirements of this Section, may issue an Interim Certificate of Class. In such cases, a statement is to be included in/with the Interim Certificate of Class reminding the Owner that the conditions of *para 3.2.1* are still applicable.

3.2.4 The Society will not issue an Interim Certificate of Class or other documents enabling the vessel to trade until any overdue surveys have been satisfactorily completed, and any overdue recommendations or conditions of class previously issued to the subject vessel have been completed by the Bureau as specified to the Owner by the previous Society.

3.2.5 When repair facilities are not available in the first port of survey, a direct voyage to a repair port may be accepted to complete surveys, outstanding recommendations and/or conditions of class.

3.2.6 The validity of the Interim Certificate of Class and the subsequent Certificate of Class will be subject to any remaining recommendations or overdue conditions of class previously issued to the vessel being completed by the due date and as specified by the transferring Society. Any remaining recommendations or conditions of class with their due dates are to be clearly stated on the:

(a) Interim Certificate of Class or an attachment to the Interim Certificate of Class and/or Class Survey Record on board.
(b) Survey Status, when the full term Certificate of Class is issued.

3.2.7 Any additional information on outstanding surveys, recommendations or conditions of class which are overdue and are to be dealt with at the first port of call. If this is not accomplished, the Interim Certificate of Class will be withdrawn immediately, unless the Owner agrees to proceed directly, without further trading, to a suitable port where any overdue surveys, recommendations or conditions of class are to be dealt with.

3.3 Technical requirements - General

3.3.1 For the transfer of class from a recognized Society to I.N.S.B. the minimum technical documentation stated in *Subsections 3.4 - 3.7* is to be submitted to the Bureau's approval

3.3.2 The Society will request from the Owner copies of plans showing the main scantlings and arrangements of the

actual vessel and machinery, together with any proposed alterations being dealt with.

3.3.3 The receipt of plans and documents listed below is to be considered by the Owner as a prerequisite for the issuance of a full term Certificate of Class by the Society.

3.3.4 Notwithstanding the aforementioned if, having made a reasonable effort to obtain the information it proves to be impracticable to obtain certain plans as listed below or equivalent technical data, the Society may issue a full term Certificate of Class, provided that its classification records show that the vessel is being accepted to class on the basis of a recorded internal review of the circumstances prevailing with respect to availability of plans.

3.4 Plans and information - Hull

3.4.1 The following information is to be submitted for approval:
(a) General arrangement plan.
(b) Midship section.
(c) Profile and deck view plans.
(d) Watertight bulkheads.
(e) Rudder span and rudderstock.
(f) Shell expansion plan.
(g) Hatch covers plan.
(h) Hull openings plan.
(i) Cargo capacity plan.
(j) Loading conditions, calculations of still water bending moments and relevant documents; particulars of loading calculations and Instructions Booklets, as applicable.
(k) Stability documents.

3.5 Plans and information - Machinery

3.5.1 The following is to be submitted:
(a) Engine room general arrangement.
(b) Diagrams of fuel (transfer and service) pipes; bilge, ballast, lubricating oil, cooling pipes, steam general service and starting compressed air piping.
(c) Diagrams of fire-fighting systems.
(d) Drawings of boilers and air receivers.
(e) Drawings of shaft line, reduction gear and propellers.
(f) Drawings of steering gear.
(g) Torsional vibration calculations as required per conditions (Required only for ships less than 2 years old or for older ships whose propelling system has been modified during the 2 years preceding classification).
(h) Fire plan.

3.6 Plans and information – Electrical equipment

3.6.1 The following is to be submitted:
(a) Master plan of power distribution, lighting and emergency power circuits.
(b) Single line diagram of networks and switchboards.
(c) Location and arrangement of electrical equipment in hazardous areas.

3.7 Miscellaneous information

3.7.1 The following documentation is also considered necessary and is to be submitted to the Society:
(a) Trim and Stability Booklet (for ships of length 24 metres and above).
(b) Loading Manual, if applicable.
(c) Damage Stability calculation, for ships which are required by IMO Conventions to comply with a subdivision and damage standard (e.g. passenger ships).
(d) Grain Loading Manual, for ships intended for the carriage of grain.
(e) Other booklets, depending on the ship's type and as required by IMO Conventions.

3.7.2 For the installations, arrangements or equipment covered by an additional class notation or a special notation the Society will determine the documentation to be submitted.

3.8 Surveys for the transfer of class

3.8.1 A survey programme will be set forth, including at least surveys overdue and due within 3 months, according t the previous Society's survey programme, plus a survey to the scope of an Annual Class Survey.

3.8.2 An In-water Survey may be required depending on the time elapsed from the last Docking Survey, at the discretion of I.N.S.B.. All due and overdue recommendations imposed by the previous Classification Society are to be dealt with as appropriate.

3.8.3 The next Special Survey will become due five years from the Special Survey held by the previous Society and not 5 years from the Class entry Surveys. The ship will follow the survey programme determined by the previous Classification Society.

3.8.4 The Load Line, Safety Construction and MARPOL applicable Surveys are to be carried out along with the Class entry Surveys.

3.8.5 A sea trial is to be held to the Surveyor's discretion if the ship has been laid up for a long period.

SECTION 4
Suspension and withdrawal of class

4.1 General

4.1.1 The class of a ship will be automatically suspended in the following cases:

(a) When the ship is operating beyond her restricted service area.
(b) When the Society considers that the ship is not complying with the Rules.
(c) When damage occurs to the ship to such an extent that impairs her class and is not repaired in accordance with the requirements of the Rules, or when alterations or conversions affecting her class are carried out, without the approval of the Society.
(d) When the ship proceeds to sea with less freeboard than that assigned, or when the freeboard marks on the ship sides are placed higher than the assigned position.
(e) When the ship is not subjected to the surveys required for maintaining the class.

4.1.2 The class may also be withdrawn by the Society upon request by the Owner or in the event of non-payment of fees.

4.1.3 For a ship whose class has been suspended, the Society will consider that her class may be reinstated after the causes of suspension are removed.

4.2 Overdue surveys

4.2.1 Owners will be notified that the 5-year Certificate of Class expires and the class is automatically suspended from the Certificate's expiry date in the event that the Special Survey has not been completed or is not under attendance for completion prior to resuming trade by the due date.

4.2.2 Under exceptional circumstances the Society may grant an extension to the Certificate of Class to allow completion of the Special Survey as stated below.

(a) Provided that the vessel is attended by a Surveyor to the Society and the Surveyor so recommends. Such an extension is not to exceed **3 months**.
In case the Certificate of Class expires when the ship is expected to be at sea, provided that there is a documented agreement to such an extension prior to the expiry date of the Certificate, that positive arrangements have been made for attendance by a Surveyor at the next port of call and provided also that the Society agrees that there is a sound technical reason for that extension. This extension will be granted upon arrival to the first port of call after the expiry date of the Certificate.

4.2.3 The class will be reinstated upon satisfactory completion of the surveys due and such surveys will be credited from the date originally due. However, the vessel is declassed (suspended or withdrawn) from the date of suspension to the date of reinstatement.

4.2.4 Overdue Annual and Intermediate Surveys

4.2.4.1 Owners will be notified that the Certificate of Class becomes invalid and class will be automatically suspended if the Annual Survey is not completed and the Certificate of Class not endorsed within 3 months of the due date of the Annual Survey or - in the case of Intermediate Surveys - if the said survey is not completed within 3 months of the third Annual Survey in each periodical survey cycle.

4.2.4.2 Class will be reinstated upon satisfactory completion of the surveys due. Such surveys are to be credited from the date originally due. However, the vessel will be declassed from the date of suspension to the date of reinstatement of class.

4.2.5 Overdue Continuous Survey items

4.2.5.1 Continuous Surveys items due or overdue at the time of Annual Survey are to be dealt with. The vessel's class will be subject to a suspension procedure if the items are not dealt with or postponed by agreement with the Surveyor to the Society.

4.3 Overdue recommendations or conditions of class

4.3.1 Each recommendation and condition of class will be assigned a due date for completion. Owners will be notified of these dates and that the vessel's class will be subject to a suspension procedure if the item is not dealt with or postponed by agreement by the due date.

4.3.2 Class will be reinstated upon verification that the overdue recommendation or condition of class has been satisfactorily dealt with. However, the vessel will be declassed from the date of suspension to the date of reinstatement of class.

4.4 Laid-up vessels

4.4.1 Vessels laid-up in accordance with the Society's requirements prior to surveys coming due need not be suspended when these surveys become overdue. However, vessels which are laid-up after being suspended as a result of surveys becoming overdue will remain suspended until the overdue surveys are completed.

4.5 Force majeure

4.5.1 If, due to circumstances reasonably beyond the Owner's or the Society's control the ship is not in a port where the overdue surveys can be completed at the expiry of the periods mentioned above, the Society may allow the vessel to sail in class directly to an agreed unloading port and thence, in ballast if necessary, to an agreed port at which the survey can be completed, provided that:

(a) Overdue surveys are carried out to a practicable extent at the first port of call.
(b) The Society is satisfied regarding the vessel's fitness to sail and that the Owner is acting in good will.

4.5.2 For the purpose of *para 4.5.1*, circumstances of force majeure will be considered the following:

(a) Damage to the vessel.
(b) Unforeseen inability of the Society to attend the vessel due to Government restrictions on right of access or personnel movement.
(c) Unforeseeable delays in port due to unusually long periods of severe weather.
(d) Inability to unload cargo due to strikes, civil strike, acts of war or other cases of force majeure.

4.5.3 If class has been suspended in cases covered by *para 4.5.2*, it may be reinstated subject to the conditions stated in this Section.

4.6 Withdrawal of class

4.6.1 When class of a vessel has been suspended for a 6 month period as a result of overdue surveys, recommendations or conditions of class, the class will be withdrawn. A longer suspension period may be granted when the vessel is not trading as in cases of lay-up, awaiting disposition in case of casualty or attendance for reinstatement.

4.7 Reclassification

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

4.8 Notifications to Owners, Flag States and Port State Control MOUs.

4.8.1 The Society will notify the suspension and/or withdrawal and/or reinstatement of class by separate letters to the Owners/ Managers, the Flag State and the pertinent Port State Control MOUs.

SECTION 5
Frequency of surveys and tests

5.1 Annual Surveys

5.1.1 For sea-going ships, Annual Surveys are to be carried out for the hull, machinery (including the electrical installations) the equipment and, where applicable, the special equipment submitted for classification (See *Ch 3, Sec 2*).

5.1.2 Annual Surveys are to be held for all ships, within **3 months** before or after each anniversary date of commencement of the class period.

5.1.3 For ships that can accommodate **more than 12 passengers**, the Annual Survey is to be held not later that the due date entered.

5.2 Intermediate Surveys

5.2.1 Extended Annual Surveys will be referred to as Intermediate Surveys (see *Ch 3 Sec 3*).

5.2.2 Intermediate Surveys are to be carried out at the second or third Annual Surveys after the assigned date of the Special Survey. Parts of the Intermediate Survey which are additional to the requirements for Annual Survey may be surveyed either at or between the second and third Annual Surveys.

5.3 Special Surveys

5.3.1 Regular programme

5.3.1.1 Special Surveys are to be carried out to the ship's hull, machinery – including the electrical equipment – and any special equipment submitted for classification (see also *Ch 3*).

5.3.1.2 The Special Class Survey may be commenced at the 4th Annual Survey and must have been completed by the end of the class period. The total survey period must not exceed 15 months.

5.3.1.3 The Periodical Surveys and inspections of propulsion systems and machinery are a part of the Special Surveys required for class, unless otherwise specified.

5.3.1.4 Special Class Surveys to hull are numbered in the sequence I, II, III, etc. Special Class Survey V and thereinafter correspond to Special Class Survey IV.

5.3.1.5 As a part of preparations for Special Class Survey, thickness measurements are to be dealt with in advance of the said survey. Thickness measurements are not to be carried out before the 4th Annual Survey. However, when deemed necessary by the Society, the thickness measurements may be dealt with – so far as practicable – in connection with the 4th Annual Survey.

5.3.1.6 Special Survey may be postponed for a maximum of 3 months beyond the five-year term in special circumstances. Such special circumstances are: unavailability of docking facilities, repair facilities, materials or spare parts, or severe weather conditions. Postponement for purely commercial reasons is excluded.

5.3.2 Continuous Survey programme

5.3.2.1 At the request of the Owner and upon approval of the proposed arrangements, a programme of Continuous Survey for hull, machinery and cargo refrigerating installations may be undertaken - except for hull surveys of oil tankers, bulk carriers and similar types of ships – whereby the Special Survey requirements are carried out in a regular cycle to complete all the items of the particular Special Class Survey within a 5 year period.

5.3.2.2 For ships other that the above, admission to the Continuous Survey programme cannot be granted for the Special Survey to hull of ships over 20 years old (for sea-going ships) or over 21 years old (for inland navigation ships), unless highly positive results relevant to the condition of structures of all compartments are available.

5.3.2.3 Approximately one-fifth of the surveyable items are to be surveyed each year and all the requirements of the particular hull Special Survey must be completed at the end of the five year cycle. The period between two subsequent surveys of each item is not to exceed 5 years.

5.3.2.4 The intervals of inspections to items concerning fire protection, inert gas system, ballast and double bottom tanks are to be specially agreed.

5.3.2.5 Where some surveyed machinery items are opened out and examined by the Chief Engineer as normal routine for the maintenance, at ports where a Surveyor to the Society is no available or at sea, the open –out inspection of the items may, upon request by the Owner and under certain conditions, be dispensed with, at the discretion of the Surveyor, subject to a confirmation survey at a convenient port of call where a Surveyor is available. The confirmation survey is to be carried out within 5 months from the date when the item was opened out and inspected by the Chief Engineer.

5.3.2.6 If deemed necessary by the Surveyor, the individual items may be inspected again.

5.3.2.7 Not more than 50% of the machinery items may be surveyed by the Chief Engineer during a 5 year cycle.

5.3.2.8 Under a Continuous Survey Machinery programme, the Chief Engineer will not be entitled to carry out surveys of the following items:
(a) Main Propulsion Diesel Engines: crankshaft and bearings / crankcase doors , crankcase and scavenging relief devices.
(b) Reduction gear and couplings, and clutches.
(c) Boilers (except utilization boilers).
(d) Pressure vessels / plant.
(e) Shaft lines.
(f) Steering machinery, other than the steering gear pump.
(g) Electrical equipment other than auxiliary motors.

5.3.2.9 The Chief Engineer is to submit, for the purposes of the confirmation survey, a report on the surveyed items. The report is to contain the following particulars:
(a) Name and particulars of surveyed item.
(b) Description of its technical condition; list of replaced or repaired parts, including the repair methods and the test results.
(c) Date and place of survey.
(d) Chief Engineer's licence.

In addition to the above mentioned report, the Chief Engineer is to submit the following:
(a) Entries from the *Engineer's Log Book* and the *Machinery Repairs Book* concerning the performed survey.
(b) Parts dismantled due to excessive wear or defects.

5.3.2.10 Thickness measurements for a vessel under a Continuous Survey Hull programme that are carried out before the 4th Annual Survey cannot be credited to the Class Special Survey

5.3.2.11 At the end of a period of class, for the purpose of class renewal, a final survey is to be performed, during which the Surveyor is to be satisfied as regards that all areas required to be surveyed have in fact been surveyed throughout with satisfactory results. If special conditions arise, the Surveyor may inspect individual parts again.

5.3.2.12 Ships under a Continuous Survey programme are not exempted from other required Periodical Surveys (such as Annual and Intermediate Surveys).

5.4 Bottom Surveys

5.4.1 Bottom Surveys serve the purpose of periodical checking of the underwater part of the hull, the openings and closures in the shell relating to machinery and of the externally arranged components of the steering and propulsion systems (see *Ch 3, Sec 8*).

5.4.2 At least two Bottom Surveys are to be carried out within a 5 year period. The second Bottom Survey is to be carried out, as far as practicable, on the occasion of the scheduled Intermediate Survey. In all cases, the maximum interval between two subsequent Bottom Surveys is not to exceed 36 months

5.4.3 A Docking Survey is to be a part of the Special Class Survey.

5.4.4 If, in exceptional cases, possible time windows (plus/minus three months) are taken advantage of, so that the interval between two Bottom Surveys exceeds 36 months, a special consent is to be obtained from I.N.S.B..

5.4.5 Upon application, an In-water Survey or bottom inspection may be carried out in lieu of every second periodical Docking Survey, with the assistance of an approved diving company.

5.4.6 Special consideration should be given to vessels of 20 years of age or over prior to the permission being granted to carry out an In-water Survey in lieu of the Docking Survey or bottom inspection.

5.4.7 If a Bottom Survey is intended to be credited to a Class Special Survey, all the checking of the hull and machinery required for the respective class renewals and usually requiring dry-docking will have to be carried out.

5.4.8 A Bottom Survey for class renewal may be carried out up to 15 months before completion of the class renewal.(for vessels other than bulk carries and oil tankers).

5.4.9 The interval between examinations of the outside of the ship's bottom and related items – for ships operating in fresh waters and for harbour and non-propelled craft - may be greater, as approved by the Society.

5.4.10 Attention is to be given to the requirements of the National or International Regulations requiring shorter intervals between examinations of the ship's bottom for certain types of vessels.

5.5 Propeller Shaft Surveys

5.5.1 The following shafts are to be submitted to Complete Survey (withdrawal survey) at intervals as described in this subsection:
(a) Shafts with continuous liner (fitted with joints satisfying the appropriate requirements when the liner consists of 2 or more lengths).
(b) Shafts made of corrosion resistant materials.

5.5.2 The Complete Survey is to be carried out:
(a) Every **3 years** for single shaft arrangements.
(b) Every **4 years** for multi-shafting arrangements.

5.5.3 Shafts covered by *para 5.5.1* may be submitted to a Complete withdrawal survey every **5 years** in the following cases:

(a) When the propeller is keyed to the shaft taper and the forward end of keyway is shaped in accordance with I.N.S.B. requirements or similar.
(b) When the propeller is fitted keyless to the aft shaft taper by means of shrinkage and the design details meet the requirements of the Rules or equivalent.
(c) When the propeller is fitted with a solid flange coupling at the end of the shaft and the design details meet the requirements of the Rules or equivalent.

5.5.4 Shafts covered by *para 5.5.3* are to be submitted to a Complete Survey every **7 years and 6 months** in the following cases:

(a) When shafts are fitted with approved oil lubricated bearing and oil sealing glands.
(b) When a Partial Survey is carried out 5 years after the last Complete Survey.

5.5.5 Shafts covered by *para 5.5.4* are to be submitted to a Complete Survey every **10 years** when, in lieu of a Partial Survey a Modified Survey is carried out 5 years after the last Complete Survey.

5.5.6 All other shafts, such as those fitted with a non-continuous liner and are in contact with sea water or have grease lubricated bearings, are to be submitted to a complete withdrawal survey every **2½ years** with an admissible time window of 6 months.

5.5.7 Special propulsion systems such as rotating thrusters, vertical axis propellers, pump jet systems, are to be inspected at intervals not exceeding 5 years.

5.6 Testing of steam boilers

5.6.1 The term ***Steam boiler*** includes exhaust gas boilers in the exhaust gas system of oil engines and hot water boilers with outlet temperatures exceeding 120ºC (except when they are heated by steam or liquids).

5.6.2 Steam boilers are to be subjected to the following examinations and tests at regular intervals:

(a) **External inspections** at annual intervals, in accordance to the inspection programme.
(b) **Internal inspections** at least twice in every 5 years class period, provided that the maximum intervals between two internal inspections shall not exceed 3 years, preferably in connection with an Intermediate and/or Class Special Survey. For ships with one main boiler only, internal inspections are to be performed every 2.5 years until 10 years after commissioning and every year thereinafter.

5.7 Testing of steam pipes

5.7.1 Steam pipes are to be examined regularly every 5 years, possibly in connection with a Special Class Survey. Starting from Special Survey II, the steam pipes are to be examined as to their internal and – where advisable – to their external condition as well, employing non-destructive testing methods where necessary

5.7.2 Steam pipes with service temperatures exceeding 500ºC are to be examined for expansion at 5 year intervals, starting from Special Survey II at the latest.

5.8 Testing of pressure vessels

5.8.1 Pressure vessels that are subject to survey by I.N.S.B. in accordance with the Rules, are to be examined internally end externally every 5 years, possibly in connection with a Special Survey.

5.8.2 Pressure vessels having a product of pressure by cubic capacity $p \times l \leq 200$ (p - in bars) are to be surveyed on the occasion of checking the pertinent piping system.

5.8.3 Periodical tests of CO_2 cylinders for fire-extinguishing purposes are to be carried out at intervals not exceeding 10 years. At least 10% of the gas cylinders are to be subjected to an internal inspection and hydrostatic test.

5.8.4 Halon containers of existing Halon fire-extinguishing systems are exempted from compliance with this requirement. Irrespective thereof, CO_2 cylinders and Halon containers are to be checked on the occasion of recharging if the test dates back 10 years or more.

5.8.5 Receivers in hydraulic or pneumatic control systems are to be examined during maintenance and repairs to the system. Air receivers with a product of pressure by cubic capacity $p \times l \geq 1000$ (p - in bars) are to be subjected to an internal inspection at least once during each class period at intervals not exceeding 5 years.

5.8.6 Intervals between surveys as referred to may be reduced, depending on the findings.

5.9 Assignment of a new class period

5.9.1 The new period of class will commence, alternatively:

(a) At the date in which the previous class expires, provided that the Special Class Survey has been completed within the 3 months preceding the date or where extension of the class period has been granted by 3 months at the most.

(b) At the date in which the Special Class Surveys were completed, provided they were completed more than 3 months before the expiry of the previous class.

SECTION 6
Class notations

6.1 General

6.1.1 The class will be indicated by a notation consisting of figures, characters and special symbols, representing the technical condition of the ship.

6.1.2 All ships, when classed, will be assigned a class notation and entered into the *Register Book*. Class notations are also entered in the Certificates of Class and other documents issued by I.N.S.B., as appropriate.

6.1.3 The class notation will include the following:

(a) Construction marks.
(b) Class symbols:
  (i) Hull character.
  (ii) Machinery installation character (if applicable).
  (iii) Division number.
  (iv) Rating letter.
  (v) Equipment symbol.
(c) Service notations.
(d) Navigation notations.
(e) Additional notations
(f) Special notations.

6.2 Construction marks

6.2.1 The following construction marks will be assigned as appropriate:


The **Anchor symbol** will be assigned to ships built in accordance with the requirements of the Rules (ships built under Special Survey).


The **Underlined Anchor symbol** will be assigned to ships built under survey by a recognized Society.

● **The bullet symbol** will be assigned to ships not built under Special Survey of any recognized Society or classed after construction which do not qualify for the Underlined Anchor mark.

6.3 Class symbols

6.3.1 The following class symbols will be assigned as appropriate:

H The **Hull Character** means that the construction and scantlings of the hull meet the relevant requirements of the Rules.

M The **Machinery Installation Character** will be placed after the Hull character and will indicate that the ship's machinery, essential auxiliary machinery, electrical installations and boilers (if any) meet the provisions of the Rules.

Aux.M This machinery notation shall be placed for the ship that is not self propelled and the ship's machinery (other than the machinery required for propulsion) meet the prevision of the rules.

100 The **Division Number** (100 or 90) will be assigned to Hull and Machinery. *Division 100*
90 ships are those which fully meet the provisions of the Rules concerning construction and scantlings of the hull, as well as essential components relating to propulsion and safety, as applicable. In the event that some construction or scantling requirements are not met, but it is deemed possible to grant the I.N.S.B. Class, the ship will be classed in *Division 90*.

The **Rating Letter** (A or B) placed after the Division Number denoted the degree of confidence the ship is worthy, as follows: The
A letter **A** denotes that a ship is considered in satisfactory condition for the intended service and is following the Periodical and Annual Surveys schedule as required by the Rules.

B The letter **B** denotes that the ship generally complies with the requirements of the Rules, but due to her condition or age it has been considered necessary to define intervals between Special Surveys shorter than those normally required for ships with the letter A.

E The **Equipment Symbol** (E), placed after the Rating Character, indicates that the ship's
- anchors and chain cables meet the relevant requirements of the Rules. When the ship's equipment does not meet the requirements of the Rules, but it is deemed by the Society to be acceptable for the intended service, the symbol **E** may be assigned. When the Society considers that it is not called upon to form an opinion on the equipment, having regard for the specific operating conditions of the ship, the symbol E will be replaced by a dash (-).

6.3.2 **Highest Class**: In relation with the above, the highest I.N.S.B. Class which may be assigned to ships or other units built under survey by the Society will be.

⚓ **H/M - 100 – A - E**

6.4 Service notations

6.4.1 Service notations will be assigned to ships provided they comply with the relevant requirements of the Rules or other requirements considered equivalent for her type or service.

6.4.2 A **combined service notation** may be assigned to a ship when requirements for each service notation are met.

6.4.3 Non self-propelled units are assigned a particular notation (-**NSP)** after their service notation.

6.4.4 When a ship is designed in such a way that certain cargo spaces may be empty when the ship is at her maximum approved draught and when the corresponding loading conditions are listed in the approved *Loading Manual*, a suitable service notation may be assigned.

6.4.5 Service notations of ships carrying **solid cargoes** will be as follows:

(a) **General Cargo ship** for ships intended to carry general cargo, other than solid cargoes in bulk.
(b) **Container ship** for ships intended to carry containers in holds and possibly on decks.
(c) **Roll on/Roll off** for sips specially intended for the carriage of vehicles or loads on wheeled beds.
(d) **Livestock carrier** for ships specially intended to carry livestock.
(e) **Refrigerated carrier** for ships specially intended for the carriage of refrigerated cargoes.

6.4.6 Service notations for ships carrying **solid cargoes in bulk** will be the following:

(a) **SBC** for ships carrying solid cargoes in bulk, constructed generally with single or tween deck.
(b) **Bulk carrier** for ships constructed generally with single decks, topside tanks and hopper side tanks in cargo spaces, and intended primarily for the carriage of dry cargo in bulk.
(c) **Ore carrier** for ships having two longitudinal bulkheads and a double bottom throughout the cargo region, intended for the carriage of ore cargoes in the centre holds only.
(d) **Bulk-ore carrier** for bulk carriers whose scantlings have been studied to allow their deadweight with empty cargo spaces.
(e) **Double Skin Bulk Carrier** for ships constructed generally with single deck, topside tanks and hopper side tanks, and intended primarily for the carriage of dry cargo in bulk, in which all cargo holds are bounded by double-side skin (regardless of the width of the wing space).

6.4.7 Notation **ESP** will be placed after the service notation if the ship is under the Enhanced Survey Programme.

6.4.8 Service notations for ships carrying **liquid cargoes in bulk** will be as follows:

(a) **Oil tanker**, for ships intended to carry liquid hydrocarbons. Where arrangements and scantlings have been approved by the Society for ships carrying oil or other liquid cargoes in bulk with a flash point above 60ºC (closed cup test), the service notation will be suitably modified to show the nature of the cargo.
(b) **Double Hull oil tanker**, for ships which are constructed primarily for the carriage of oil in bulk, 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 carriage of water ballast or void spaces.
(c) **Chemical tanker**, for ships intended to carry dangerous liquids in bulk. The Certificate of Class shall indicate the type of ship as per IBC/BCH code. For ships intended to carry one type of product, the service notation *Chemical tanker* may be completed with designation of the product.
(d) **Tanker,** for ships intended to carry in bulk non-dangerous liquids such as wine, potable water, etc. The list of cargoes the ship is entitled to carry may be attached to the Certificate of Class. For ships intended to carry one type of cargo, the service notation may be completed with the designation of the cargo.
(e) **Liquefied gas carrier** for ships intended to carry liquefied gases and other substances. The list of products the ship is entitled to carry will be attached to the Certificate of Class. For ships intended to carry one product, the service notation *Liquefied gas carrier* may be completed with the designation of the product.

6.4.9 Service notations for **passenger ships** will be as follows:

(a) **Passenger ship**, for ships intended to carry more than 12 passengers.
(b) **Passenger ferry**, for passenger ships corresponding to the above definition and specially equipped to carry complete trains or wheeled vehicles.

6.4.10 Service notations for ships engaged on dredging activities will be the following:

(a) **Dredger**, for ships specially equipped for dredging activities.
(b) **Hopper dredger,** for ships specially equipped for dredging and carrying dredged material.
(c) **Hopper barge**, for ships or barges specially intended for the carriage of spoils or dredged material,
(d) **Split hopper dredger**, for ships specially equipped for dredging and carrying dredged material and which open longitudinally.
(e) **Split hopper barge**, for ships or barges specially intended for the carriage of spoils or dredged materials and which open longitudinally.

6.4.11 Service notations for **service ships** and **offshore working ships** or units will be the following:

(a) **Tug**, for ships specially intended for towage.
(b) **Supply vessel**, for ships specially intended for the service to offshore units.
(c) **Floating dock**, for floating dry-docks.
(d) **Pontoon**, for units specially intended for the carriage of solid cargoes exclusively on weather decks.

(e) **Pontoon/derrick** or **Pontoon/crane** for units intended to support equipment such as cranes or derricks.
(f) **Barge**, for units intended for the carriage of solid bulk cargoes in cargo holds.
(g) **Tank barge**, for units intended for the carriage of liquid bulk cargoes in cargo tanks.
(h) **Oil recovery**, for ships equipped for the recovery of oil from the sea surface.

6.4.12 Other service notations will be the following:
(a) **Fishing vessel**, for ships engaged on the capture, but not on processing, of fish and other living resources of the sea.
(b) **Yacht,** for vessels intended for pleasure cruising.
(c) **Seagoing launch**, for launches and motorboats less than 24 m intended for sea-going service, limited to wind force 6 Beaufort scale.
(d) **Launch,** for vessels less than 24 m in length intended to operate in ports, roadsteads, harbours and generally calm waterways. Limited to wind force 4 Beaufort scale.

6.4.13 **Heavy Cargoes**, for ships strengthened for the carriage of heavy cargoes (cargoes with stowage coefficient below 0.865 m^3/ton).

6.4.14 The Society may define other service notations by means of provisional Rules or recommendations, which will be published as Provisional Rules or Guidelines.

6.5 Navigation notations

6.5.1 Every ship will be assigned a navigation notation according to her design, configuration, scantlings and other construction arrangements.

6.5.2 The navigation notation assigned by the Society is not dependant upon factors, not considered in the Rules. Consequently, no comparison is to be made between a navigation notation assigned by I.N.S.B. and a navigation notation category defined by any National or International body.

6.5.3 Self-propelled or non-propelled ships which are capable of unrestricted navigation in any area at any season of the year will not be assigned a specific navigation notation.

6.5.4 The absence of a navigation notation will indicate that the Society considers that the ship concerned has the capacity to operate without restrictions.

6.5.5 The navigation notations are the following:

RIS ***Restricted International Service***, assigned to ships operating at a maximum distance from the nearest port of shelter not exceeding 200 nautical miles or operating within enclosed seas, e.g., the Mediterranean Sea, the Black Sea and similar waterways.

CS ***Coastal Service***, assigned to ships operating along a coast, at a maximum distance from shore generally not exceeding 20 nautical miles, unless some other distance is specified for coastal service by the ship's Administration.

SW ***Sheltered Waters*** assigned to ships operating in harbours, estuaries, bays or generally calm stretches of water where there is no running of heavy seas, as well as outside these areas for not more than short distances, generally less than 5 nautical miles and when the wind force does not exceed 6 Beaufort scale.

6.5.6 The designation of the geographical area where the ship operates, or the most unfavourable conditions considered may be added to the navigation notation.

6.5.7 The Society reserves the right to assign the navigation notation subject to the conditions of the seaway prevailing in the respective service area.

6.6 Additional notations

6.6.1 Machinery installations which comply with the requirements of the Rules for automated or remote controlled systems will have the following additional class notations affixed to the Certificate of Class:

UMS ***Unmanned Machinery Space***, for ships fitted with equipment for unattended engine room, provided that it may be left unattended continuously for a period of 24 hours.

6.6.2 The following notations are associated with control and automation equipment:

ICC ***Integrated Computer Control***. For ships whose arrangements are such that the control and supervision of ship operational functions are computer based.

SBL ***Superior Bridge Layout.*** This notation will be assigned when a superior bridge layout and level of navigation equipment are provided

1-W ***One Watchkeeper.*** This notation will be assigned when the bridge layout and level of equipment are such that the ship is considered suitable for safe periodic operation under the supervision of a single watchkeeper on the bridge.

IBS ***Integrated Bridge System.*** This additional notation will be assigned where an integrated bridge system is fitted to provide electronic chart display, track planning and automatic track following, centralized navigation information display, and bridge alarm management. Upon assignment of this notation, the ship will also be assigned either SBL or 1-W.

DYN (CM) ***Dynamic positioning (Centralized-Manual).*** For ships fitted with centralized remote manual controls for position keeping and with position reference system(s) and environmental sensor(s).

DYN (AM) ***Dynamic positioning (Automated-Manual).*** For ships fitted with automatic main and manual standby controls for position keeping and with position reference system(s) and environmental sensor(s).

DYN (AA) ***Dynamic positioning (Automated-Automated)*** For ships fitted with automatic main and automatic standby controls for position keeping and with position reference systems and environmental sensors.

DYN (FA) ***Dynamic positioning (Fully Automated)*** For ships fitted with automatic main and automatic standby controls for position keeping, and with an additional/emergency automatic control unit located in a separate compartment and with position reference systems and environmental sensors.

6.6.3 **Ice category notations** will be assigned to **ice class ships** which are ships intended for independent ice navigation including motion in fractures between floes, surmounting of ice isthmuses and portions of relatively thin ice, or navigation in ice with icebreaker escort. The following notations are associated with ice categories:

ICE-II Ships built for independent occasional navigation in freezing non-Arctic seas, in open pack ice with a thickness 0.4 m at a speed of 5 knots and navigation in the wake of an icebreaker in compact ice (thickness 0.35 m) at a speed of 3 knots.

ICE-C Ships built for independent regular navigation in freezing non-Arctic seas, in open pack ice with a thickness 0.55 m at a speed of 5 knots and navigation in the wake of an icebreaker in compact ice (thickness 0.5 m) at a speed of 3 knots.

ICE-B Ships built for independent regular navigation in freezing non-Arctic seas, in open pack ice with a thickness 0.7 m at a speed of 5 knots and navigation in the wake of an icebreaker in compact ice (thickness 0.65 m) at a speed of 3 knots.

ICE-A Ships built for independent navigation in Arctic seas under moderate weather conditions, at a top speed of 6-8 knots in open floating first-year ice with a thickness of 0.6 and 0.8 m in the winter/spring and summer/autumn navigation, respectively.

ICE – A SUPER Ships built for independent navigation in Arctic seas under moderate weather conditions, at a top speed of 6-8 knots in open floating first-year ice with a thickness of 0.8 and 1.0 m in the winter/spring and summer/autumn navigation, respectively.

6.6.4 Other additional notations are the following:

RMC ***Refrigerated Machinery Class.*** This notation may be assigned to refrigerating installations when they meet the requirements of the Rules or other requirements considered equivalent. In general, notation RMC will be followed by the minimum temperature in the refrigerated space to be maintained with maximum sea temperature. When the installation is fitted with additional equipment suitable for the carriage of special cargoes or quick freezers in fishing vessels, an appropriate descriptive note will be added.

IGS ***Inert Gas System***. This notation will be assigned to ships with the service notation **Oil tanker**, fitted with an inert gas plant for cargo tanks

REDSC ***Reduced Scantlings.*** Ships having reduced scantlings in certain hull members, within limits agreed with the Bureau.

E(exh.g) For ships fitted with exhaust gas economizer.

B(exh.g) For ships fitted with exhaust gas boiler.

6.7 Special notations

6.7.1 Special notations may be assigned upon request from the party applying for classification, indicating that the ship or some of her arrangements and/or installations comply with specific International, National or other regulations that are not necessarily covered by the present Rules.

SECTION 7
Survey planning, preparation and performance

7.1 General

7.1.1 The Owner is to be aware of the scope of the forthcoming survey and instruct those responsible, such as the Master or Superintendent, to make the necessary preparations.

7.1.2 Survey performance will be heavily influenced by the type of survey to be carried out. The scope of survey will have to be determined prior to its performance.

7.1.3 Whenever deemed advisable or required by the Periodical Survey, the Surveyor is to study the ship's structural arrangements and review the ship's operating and survey record and those of sister ships - where possible – to determine any known potential problem areas particularly those affecting the class of the ship.

7.1.4 Sketches of typical structural elements are to be prepared in advance, so that any defects or ultrasonic thickness measurements can be recorded rapidly and accurately.

7.1.5 The Surveyor may, if deemed necessary by the condition of the ship, request additional surveys to be performed over and above those surveys initially assigned. In such instances the Society's Head Office is to be promptly notified for necessary actions.

7.1.6 The Surveyor shall inform the owner, manager or operator of the ship surveyed of his recorded recommendations or other discrepancy when the hull, machinery, or other equipment have been found not in compliance with the requirements of the Society's Rules, Regulations or other standards as apply. Upon this notification, the owner, the manager or operator of the ship surveyed is to take necessary rectification actions to the satisfaction of the Society's Surveyor.

7.1.7 The Surveyor shall report to the Society without delay on the progress and/ or results of the performed surveys.

7.1.8 Should a disagreement arise between the Owner and the Surveyor during a survey, the Society will, at the Owner's request, nominate another Surveyor.

7.2 Conditions for survey

7.2.1 The Owner is to provide the necessary facilities for a safe execution of the survey.

7.2.2 Should the Society's attending surveyor considers that the provisions of safety and required access are not adequate, the survey may be not be performed and rescheduling of same shall be organized in contact between the Society's Head Office and client.

7.2.3 The Surveyor is to undertake all surveys for which application is made to the Society and as may be assigned by the Society's Head Office. The Society's surveyors apply accepted examination and testing standards to those items specified for each survey by the Rules, survey procedures, and internationally accepted safety related criteria.

7.2.4 Tanks and spaces are to be sufficiently clean and free from water, scale, dirt, oil residues, etc., and sufficient illumination is to be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration. This applies, particularly, to areas which are subject to thickness measurements.

7.3 Access arrangements and safety

7.3.1 In accordance with the intended survey, in cargo holds and salt water ballast tanks a secure and acceptable means of access is to be provided. This means of access can consist of a permanent staging, temporary staging or ladders, lifts and movable platforms or other equivalent means.

7.3.2 In addition to the stated above, particular attention is to be given to the following:

(a) Prior to entering tanks and other enclosed spaces (e.g. chain lockers, void spaces) it is necessary to ensure that the oxygen content is tested and proven safe. A responsible member of the crew is to remain at the entrance to the space and, if possible, communication links are to be established with both the bridge and engine room. Adequate lighting is to be provided in addition to a hand held torch (flashlight).
(b) In tanks where the structure has been coated and recently deballasted, a thin slippery film may often remain on the surfaces. Care should be taken when inspecting such spaces.
(c) The removal of scale can be extremely difficult. The removal of scale by hammering may cause sheet scale to fall. When using a chipping or scaling hammer care should be taken to protect eyes and, where possible, safety glasses should be worn.
(d) If the structure is heavily scaled, then it may be necessary to request de-scaling before conducting a satisfactory visual examination.
(e) For safety reasons, surveys are not to be held during unloading operations in the hold.
(f) When entering a cargo hold or tank the bulkhead vertical ladders should be examined prior to descending to ensure that they are in good condition and rumps are not missing or loose. If holds are entered with the hatch covers in the closed position, then adequate lighting is to

be arranged in the holds. One person at a time should ascend or descend the ladder.

(g) If a portable ladder is used for survey purposes, the ladder should be in good condition and fitted with adjustable feet to prevent it from slipping. Two crew members should be in attendance to ensure that the base of the ladder is adequately supported during use.

(h) If a hydraulic arm vehicle ("Cherry Picker") is used to enable the examination of the upper parts of the cargo hold structure, the vehicle is to be operated by qualified personnel and there should be evidence that the vehicle has been properly maintained. For vehicles equipped with a self-levelling platform, care should be taken that the locking device is engaged after engagement to ensure that the platform is fixed.

(i) Staging is the most common means of access, especially provided where repairs or renewals are being carried out. It should be always be correctly supported and fitted with handrails.

(j) In double bottom tanks there will often be a build-up of mud on the bottom of the tank and this should be removed, particularly in way of tank boundaries, suction and sounding pipes, to enable a clear assessment of the structural condition.

7.4 Equipment and tools

7.4.1 The following protective clothing and equipment is to be worn as applicable during the surveys:

(a) Working clothes.
(b) Head protection.
(c) Hand and arm protection.
(d) Foot protection.
(e) Ear protection.
(f) Eye protection.
(g) Breathing protection.
(h) Lifejacket.

7.4.2 The following survey equipment is to be used as applicable during the surveys:

(a) Torches.
(b) Hammer.
(c) Oxygen analyzer / Multi-gas detector.
(d) Safety belts and lines should be worn where high risk of falling down from more than 3 metres is present.
(e) Radiation meter.

7.5 Thickness measurements and fracture detection

7.5.1 Thickness measurements are to comply with the requirements of the Rules (see *Ch 3*).

7.5.2 Thickness measurements are to be carried out at points that adequately represent the nature and extent of any corrosion or wastage of the respective structure (plate, web, etc.).

7.5.3 Thickness measurements are to be normally carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven as required.

7.5.4 Thickness measurements are to be carried out by a qualified company, approved/certified by a recognized Classification Society or according to ISO 9000 standards.

7.5.5 One or more of the following fracture detection procedures may be required if deemed necessary and is to be performed by qualified technicians:

(a) Radiographic.
(b) Ultrasonic.
(c) Magnetic particle.
(d) Dye penetrant.

7.6 Survey at sea or anchorage

7.6.1 Voyage surveys may be accepted, provided the survey party is given the necessary assistance from the ship's personnel.

7.6.2 The necessary precautions and procedures to carry out the voyage survey are to be in accordance with *Subs 7.1 - 7.5*. Ballasting systems are to be secured at all times during tank surveys.

7.6.3 A communication system is to be arranged between the survey party in spaces under examination and the responsible officer on deck.

Section

1 General

2 Annual Survey

3 Intermediate Survey

4 Special Survey Hull I (Age of ship up to 5 years)

5 Special Survey Hull II (Age of ship 5-10 years)

6 Special Survey Hull III (Age of ship 10-15 years)

7 Special Survey Hull IV (Age of ship over 15 years) and Special Surveys thereafter

8 Bottom Surveys

9 Propeller Shaft Surveys

10 Special Survey Machinery

11 Periodical Survey and testing of machinery items

12 Thickness Measurements

SECTION 1
General

1.1 Application

1.1.1 The requirements of this chapter apply to all ships. For special types of ships refer to *Chapter 5*.

1.2 Definitions

1.2.1 Ballast Tank

A Ballast Tank is a tank that is being used primarily for salt water ballast.

1.2.2 Spaces

Spaces are seperate compartments including holds and tanks.

1.2.3 Close Up Survey

A Close-up Survey is a survey where the details of structural components are within the close visual inspection range of the surveyor, i.e. normally within reach of hand.

1.2.4 Transverse Section

A Transverse Section includes all longitudinal members such as plating, longitudinals and girders at the deck, sides, bottom, inner bottom and longitudinal bulkheads. For transversely framed vessels, a transverse section includes adjacent frames and their end connections in way of transverse sections.

1.2.5 Representative Space

Representative Spaces are those which are expected to reflect the condition of other spaces of similar type and service and with similar corrosion prevention systems. When selecting representative spaces, account is to be taken of the service and repair history on board and identifiable Critical Structural Areas and/or Suspect Areas.

1.2.6 Critical Structural Area

Critical Structural Areas are locations which have been identified from calculations to require monitoring or from the service history of the subject ship or from similar ships or sister ships, if applicable, to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

1.2.7 Suspect Area

Suspect Areas are locations showing Substantial Corrosion and/or are considered by the surveyor to be prone to rapid wastage.

1.2.8 Substantial Corrosion

Substantial Corrosion is an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of allowable margins, but within acceptable limits.

1.2.9 Corrosion Prevention System

A Corrosion Prevention System is normally considered a full hard protective coating.

Hard Protective Coating is usually to be epoxy coating or equivalent. Other coating systems, which are neither soft nor semi-hard coatings, may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the manufacturer's specifications.

1.2.10 Coating Condition

Coating Condition is defined as follows:

GOOD condition with only minor spot rusting.

FAIR condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition.

POOR condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

1.2.11 Cargo Length Area

Cargo Length Area is that part of the ship which contains all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces.

1.2.12 Special Consideration

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

1.2.13 Prompt and Thorough Repair

A Prompt and Through Repair is a permanent repair completed at the time of survey to the satisfaction of the surveyor, therein removing the need for the imposition of any associated condition of classification.

1.2.14 Air pipe Heads

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

1.3 Repairs

1.3.1 Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which affects or, in the opinion of the Surveyor, will affect the vessel's structural, watertight or weathertight integrity, is to be promptly and thoroughly repaired. Areas to be considered include:

- side shell frames, their end attachments and adjacent shell plating;
- deck structure and deck plating;
- bottom structure and bottom plating;
- watertight bulkheads;
- hatch covers and hatch coamings;
- weld connections between air pipes and deck plating;
- air pipe heads installed on the exposed decks;
- ventilators, including closing devices.

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

1.3.2 Additionally, when a survey results in the identification of structural defects or corrosion, either of which, in the opinion of the surveyor, will impair the vessel's fitness for continued service, remedial measures are to be implemented before the ship continues in service.

1.3.3 Where the damage found on structure mentioned in *para 1.3.1* is isolated and of a localised nature which does not affect the ship's structural integrity, consideration may be given by the surveyor to allow an appropriate temporary repair to restore watertight or weather tight integrity and impose a Recommendation/Condition of Class, with a specific time limit.

1.4 Thickness measurements and close-up surveys

In any kind of survey, i.e. special, intermediate, annual or other surveys having the scope of the foregoing ones, thickness measurements of structures in areas where close-up surveys are required, shall be carried out simultaneously with close-up surveys.

SECTION 2
Annual Survey

2.1 General

2.1.1 At every Annual Survey, the ship is to be generally examined afloat. The survey is to include a visual examination of a sufficient extent of the ship and her equipment and certain tests to confirm that their condition is being properly maintained.

2.1.2 The scope of the Annual Survey may be modified as necessary, at the discretion of the Society, to cover specific arrangements for ships under 500 gross tonnage, or ships with a special service notation (e.g. a fishing vessel under 24 m in length; a vessel operated solely in freshwater).

2.1.3 Any specific equipment or arrangement covered by a service notation or an additional class notation, and for which Annual Survey is not detailed in this or the subsequent Sections or in any other publication of the Society, may be submitted to a Survey Programme agreed with the Society.

2.2 Annual Survey - Hull

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

2.2.2 A general examination of the hull plating and its closing appliances, so far as they can be seen, and a general examination of the watertight penetrations, are to be carried out, including:

(a) Side shell plating above the waterline.
(b) Cargo ports.
(c) Accessible parts of rudder.
(d) Weather decks.
(e) Bulwarks, including the provisions of freeing ports, special attention being given to any freeing ports fitted with shutters.
(f) Guardrails, gangways, walkways and other means provided for the protection of the crew and means for safe passage of crew.
(g) Ventilators and air pipes, including their coamings and closing appliances
(h) Weld connections between air pipes and deck plating.
(i) Flame screens on vents to all bunker tanks.
(j) Overflow and sounding pipes.
(k) Superstructures end bulkheads and the openings therein.
(l) Engine casing, skylights, miscellaneous hatches.
(m) Ladders on weather decks.

2.2.3 Anchoring and mooring equipment is to be surveyed, including the working test of windlass. For ships built after 01/01/2007, confirming that the towing and mooring equipment is properly marked with any restriction associated with its safe operation.

2.2.4 Cargo holds/tanks are to be surveyed as deemed necessary, depending of the overall condition of the ship.

2.2.5 Examining each bilge pump and confirming that the bilge pumping system for each watertight compartment is satisfactory.

2.2.6 Confirming that the drainage from enclosed cargo spaces situated on the freeboard deck is satisfactory.

2.2.7 A confirmation is to be carried out, as far as practicable, that no significant changes have been made to the arrangement of structural fire protection.

2.2.8 Verification that loading guidance and stability data are on board ready for use.

2.2.9 Checking of the positions of the deck line and load line which, if necessary, are to be re-marked and re-painted.

2.2.10 Verification that no alterations have been made to the hull or superstructures which would affect the calculation determining the position of load lines.

2.2.11 Checking, when applicable, the fittings and appliances for timber deck.

2.2.12 The Annual Survey of **hatch covers and coamings** will include the following:

(a) Confirmation that no significant changes have been made to the hatch covers, hatch coamings and their securing and sealing devices.
(b) When fitted with **portable covers, wooden or steel pontoons**, checking of the satisfactory condition of:
  (i) Wooden covers and portable beams, carriers or sockets for portable beams and their securing devices.
  (ii) Steel pontoons.
  (iii) Tarpaulins.
  (iv) Cleats, battens and wedges.
  (v) Hatch securing bars and their securing devices.
  (vi) Loading pads/bars and the side plate edge.
  (vii) Guide plates and chocks.
  (viii) Compression bars, drainage channels and drain pipes (if any).
(c) When fitted with **mechanically operated steel covers**, checking of the satisfactory condition of:
  (i) Hatch covers.
  (ii) Tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels).
  (iii) Clamping devices, retaining bars, cleating.

(iv) Chain or rope pulleys.
(v) Guides, guide rails and track wheels.
(vi) Stoppers.
(vii) Wires, chains, gypsies, tensioning devices.
(viii) Hydraulic system essential to closing and securing.
(ix) Safety locks and retaining devices.
(x) Random checking of the satisfactory operation of hatch covers, including :
- stowage and securing in open condition;
- proper fit, locking and efficiency of sealing in closed position;
- operational testing of hydraulic and power components, wires, chains and link drives.

(d) Checking of the satisfactory condition of hatch coaming plating and their stiffeners.

2.2.13 **Protection of other openings** is to be surveyed, including:
(a) Hatchways, manholes, and scuttles in freeboard and superstructure decks.
(b) Portlights together with deadcovers.
(c) Cargo ports, bow or stern access.
(d) Chutes and similar openings in ship's sides or ends below the freeboard deck or in way of enclosed superstructures.
(e) Ventilators, air pipes together with flame screens, scuppers, inlets and discharges serving spaces on or below the freeboard deck.
(f) All air pipe heads installed on the exposed decks
(g) The collision and watertight bulkheads, bulkhead penetrations and walls of enclosed superstructures.
(h) Weathertight and watertight doors and closing appliances for all the above including proper operation (locally and remotely) of such doors.

2.2.14 Suspect Areas

Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. *Table E* of *Sec 12* to be used as guidance for the additional thickness measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

2.2.15 Examination of Ballast Tanks.

Examination of ballast tanks when required as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements are to be increased to determine the extent of areas of substantial corrosion. *Table E* of *Sec 12* to be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the Annual Survey is credited as completed.

2.3 Annual Survey - Machinery

2.3.1 For the machinery and electrical installations the Annual Survey will consist of:
(a) A general examination of the machinery the boilers, all steam, hydraulic, pneumatic and other systems and their associated fittings to see whether they are being properly maintained and with particular attention to the fire and explosion hazards.
(b) Confirmation that the machinery, boilers and other pressure vessels, associated piping systems and fittings are installed and protected so as to reduce to a minimum any danger to persons on board, due regard being given to moving parts, hot surfaces and other hazards.
(c) Confirmation that the normal operation of the propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative, when appropriate.
(d) Confirmation that means are provided so that the machinery can be brought into operation from the dead ship condition without external aid.
(e) Confirmation that emergency escape routes are practicable and not blocked.
(f) Testing of the means of communication and order transmission between the navigating bridge and the steering gear compartment as well as the means of indicating the angular position of the rudder.
(g) Confirmation that with ships having emergency steering positions there are means of relaying heading information and, when appropriate, of supplying visual compass readings to the emergency steering position.
(h) Confirmation that the engine room telegraph, the second means of communication between the navigation bridge and the machinery space and the means of communication with any other positions from which the engines are controlled are operating satisfactorily.
(i) Confirming that the engineer's alarm is clearly audible in the engineer's accommodation, when appropriate.
(j) Examination of the means for the operation of the main and auxiliary machinery essential for the propulsion and the safety of the ship, including, when applicable, the means of remotely controlling the propulsion machinery from the navigating bridge (including the control, monitoring, reporting, alert and safety actions) and the arrangements to operate the main and other machinery from a machinery control room.
(k) confirming the operation of the ventilation for the machinery spaces.
(l) Examination, so far as practicable, of the bilge pumping systems and bilge wells, including operation of the pumps, remote reach rods and level alarms, where fitted.

(m) External examination of pressure vessels and their appurtenances, including safety devices, foundations, controls, relieving gear, high pressure and steam escape piping, insulation and gauges.
(n) Confirming that the various alarms required for hydraulic power-operated, electric and electro-hydraulic steering gears are operating satisfactorily and that the re-charging arrangements for hydraulic power-operated steering gears are being maintained.
(o) General examination visually and in operation, as feasible, of electrical machinery and emergency source of electrical power. If they are automatic, also in the automatic mode.
(p) General examination of switchgear, switchboards and other electrical equipment and megger testing of selected parts of the installation, when deemed necessary.
(q) Examining visually the condition of any expansion joints in seawater systems.

2.3.2 For the fire fighting equipment, the Annual Survey will consist of:
(a) Confirmation that fire control plans are properly posted.
(b) Examination and testing, as feasible, of the operation of manual and/or automatic fire doors, where fitted.
(c) Examination, as far as practicable, and testing, as feasible, of the fire and/or smoke detection systems.
(d) Examination of the fire main system and confirmation that each fire pump including the emergency fire pump can be operated separately so that the two required powerful jets of water can be produced simultaneously from different hydrants at any part of the ship whilst the required pressure is maintained in the fire main.
(e) Confirmation that fire hoses, nozzles, applicators and spanners are in good working condition and situated at their respective locations.
(f) External examination of CO_2 / Halon receivers.
(g) Examination of fixed fire-fighting system controls, piping, instructions and marking; checking for evidence of proper maintenance and servicing, including date of last system tests.
(h) Confirmation that semi-portable and portable fire extinguishers, of portable foam applicator units are in their stowed positions; checking for evidence of proper maintenance and servicing, conducting random check for evidence of discharged containers.
(i) Confirmation that the remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces are in working order.
(j) Checking of fire detection and alarm systems.
(k) Examination of the closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnels, where applicable.
(l) Confirmation that foam concentrates are periodically (twice every 5 years) tested, either by the Manufacturer or by an organization agreed by him.
(m) Confirmation that the fireman's outfits and emergency escape breathing devices - EEBDs - are complete and in satisfactory condition and that the cylinders, including spare cylinders, of any required self-contained breathing apparatus are suitably charged.
(n) Examination, when appropriate, the special arrangements for carrying dangerous goods, including checking the electrical equipment and wiring, the ventilation, the provision of protective clothing and portable appliances and the testing of the water supply, bilge pumping and any water spray system.

SECTION 3
Intermediate Survey

3.1 General

3.1.1 The requirements for Annual Surveys are to be complied with and, additionally, the requirements of the present Section.

3.2 Intermediate Survey - Hull

3.2.1 Ballast tanks

3.2.1.1 For ships 5 years old and over, and less than 10 years:

(a) An internal examination of representative salt water ballast tanks is to be carried out. When such examination reveals no visible structural defects, the examination may be limited to the verification that the protective coating remains efficient.
(b) Where poor coating condition, corrosion or other defects are found in salt water ballast spaces or where a hard protective coating was not applied from the time of construction, the examination is to be extended to other ballast spaces of the same type.
(c) For salt water ballast spaces other than double bottom tanks, where a protective coating is found in poor condition and is not renewed, where soft or semi-hard coating has been applied or where a hard protective coating was not applied from the time of construction, maintenance of class is to be subject to the tanks in question being internally examined and thickness measurement carried out as deemed necessary at annual intervals.
(d) For salt water ballast double bottom tanks, where such breakdown of hard protective coating is found, where a soft or semi-hard coating has been applied or where a coating has not been applied from the time of construction, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.
(e) When extensive corrosion is found, thickness measurements may be required.

3.2.1.2 For ships 10 years old and over, the requirements of *3.2.1.1* are to be complied with and, additionally:

(a) An internal examination of all salt water ballast spaces is to be carried out. Where such examination reveals no visible structural defects, the examination may be limited to a verification that the protective coating remains efficient..
(b) For salt water ballast spaces other than double bottom tanks, where a hard protective coating is found in poor condition and is not renewed, where soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction, maintenance of class is to be subject to the tanks in question being internally examined and thickness measurement carried out as deemed necessary at annual intervals.
(c) For salt water ballast double bottom tanks, where such breakdown of hard protective coating is found, where a soft or semi-hard coating has been applied or where a coating has not been applied, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.
(d) When extensive corrosion is found, thickness measurements may be required.

3.2.1.3 Double bottom ballast spaces in way of cargo holds have to be tested, for ships 10 years old or over.

3.2.2 Cargo holds

3.2.2.1 Ships over 10 years of age.

(a) An internal examination of at least one forward and one after cargo hold is to be carried out.
(b) For ships with only two cargo holds, either one cargo hold is to be examined.

3.2.2.2 For ships over 15 years of age an internal examination of all cargo holds is to be carried out.

3.2.3 Cargo Tanks of non-ESP Tankers

3.2.3.1 Ships over 10 years of age.

(a) An internal examination of at least one forward and one after cargo tank is to be carried out.
(b) For ships with only two cargo tanks, either one cargo tank is to be examined.

3.2.3.2 For ships over 15 years of age an internal examination of all cargo tanks is to be carried out.

3.4 Intermediate Survey - Machinery

3.4.1 During the Intermediate Survey to the ship's machinery, the requirements of the Annual Surveys are to be met.

SECTION 4
Special Survey Hull I (Age of ship up to 5 years)

4.1 General

4.1.1 In addition to the surveys and checks required for the Intermediate Survey, on the occasion of Special Class Survey, the requirements of the present Section are to be complied with.

4.1.2 The Special Survey is to be held, as a rule, when the ship is in dry-docking or on a slipway, unless a Docking Survey has been carried out within the admissible period (see *Ch 2 Subs 5.4*).

4.2 Preparation

4.2.1 The holds, tweendecks, peak tanks, deep tanks, engine and boiler spaces and other spaces, are to be cleared and cleansed as necessary and the bilges and limbers all fore and aft are to be cleansed and prepared for examination.

4.2.2 Platform plates in engine and boiler spaces are to be lifted as may be necessary for the examination of the structure below.

4.2.3 Where necessary, close and spar ceiling, lining and pipe casings are to be removed for examination of the structure.

4.2.4 The examination is to be sufficient to reveal substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

4.2.5 The bottom ceiling in holds of single bottom ships is to be lifted to such an extent that at least 2 strakes on each side (one strake being at the bilge) and all portable hatches in holds and flooring plates in machinery and boiler spaces are to be removed for examination of the structure below.

4.2.6 Where a double bottom is fitted, a sufficient ceiling is to be lifted from the inner bottom to enable the Surveyor to satisfy himself as to the condition of the tank top plating and, if necessary, all ceiling is to be removed for ascertaining the condition.

4.2.7 The cement or other composition on the inner surface of the bottom plating is to be carefully examined. The removal of this covering may be dispensed with provided that it is tested by beating or chipping and found sound and adhering satisfactorily to the steel plating.

4.2.8 The steel work is to be examined before painting or before the cement or other covering is renewed.

4.2.9 Where holds are insulated for the purpose of carrying refrigerated cargoes and the hull in way of the insulation was examined by the Surveyor at the time such insulation was fitted, it will be sufficient to remove the limbers and hatches to enable the framing and plating in way to be examined. In other cases, additional insulation is to be removed as necessary for the Surveyor to be satisfied as to the condition of the structure.

4.3 External examinations

4.3.1 A general examination of the hull and hull equipment, as required by *Subs 2.2* for the Annual Survey of hull, is to be carried out.

4.3.2 Decks are to be examined and particular attention being given to the areas where stress concentration or increased corrosion are likely to be developed, such as hatch corners and other discontinuities of structure.

4.3.3 Deck erections such as hatch coamings, deckhouses and superstructures are to be examined.

4.3.4 Worn out, worm-eaten or rotten parts of wooden decks are to be renewed to the Surveyor's satisfaction. The same applies to wood-sheathed steel decks, the sheathing of which may be removed in places to ascertain the condition of plating underneath.

4.3.5 Masts and standing rigging are to be examined.

4.3.6 Anchors chain cables and windlasses are to be examined and checked. Lengths of chain cables worn out more than **12%** from their nominal diameter are to be renewed.

4.3.7 The engine room structure is to be examined. Particular attention is to be given to tank tops, brackets connecting side, shell frames, tank tops and engine room bulkheads in way of tank top and bilge wells. Where wastage is evident or suspected, thickness measurements are to be carried out.

4.4 Examination of tanks

4.4.1 The seawater ballast tanks are to be examined at the Surveyor's discretion.

4.4.2 For seawater ballast spaces other than double bottom tanks, where a hard protective coating is found in poor condition and is not renewed, where soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction, maintenance of class is to be subject to the tanks in question being internally examined and thickness measurement carried out as deemed necessary at annual intervals.

4.4.3 For seawater ballast double bottom tanks, where breakdown of hard protective coating is found, where a soft or semi-soft coating has been applied or where a coating has not been applied from the time of construction, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.

4.4.4 Fuel oil, lubricating oil and feed water tanks need not be emptied if their tightness can be verified by an external examination while they are completely filled and there is no reason for doubt as to their proper condition.

4.4.5 **Peak tanks** (all uses) are subject to internal examination.

4.5 Tightness tests

4.5.1 Each compartment of the double bottom and all tanks, the boundary bulkheads of which form part of the main structure of the ship, are to be subjected to a pressure test. Fuel, lubricating oil and feed water tanks may be tested by filling with the respective liquid.

4.5.2 The applied test pressure is to correspond to a head of water up to the top of the hatch for cargo tanks or up to the top of the overflow/air pipe of the tank, whichever is higher.

4.5.3 The tightness of pipe tunnels outside the inner bottom and of void spaces can be tested by air pressure. Testing of other spaces by air pressure is to be agreed with the Surveyor in each particular case.

4.6 Holds and other spaces

4.6.1 Holds, tweendecks, void spaces, cofferdams and other spaces which are integral to the ships structure are to be internally examined.

4.6.2 Plating under bilge wells in holds and engine room is to be examined.

4.7 Hatch covers and coamings

4.7.1 Hatch covers and coamings are to be examined as follows:

(a) A thorough inspection of the items listed in Annual Surveys is to be carried out.
(b) Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:
  (i) stowage and securing in open condition;
  (ii) operational testing of hydraulic and power components, wires, chains, and link drives.
(c) The effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent is to be checked.

4.8 Automatic Air Pipe Heads

4.8.1 For all ships, automatic air pipe heads are to be examined (both internally and externally) as follows :

(a) Two air pipe heads, one port and one starboard, located on the exposed decks in the forward 0.25L, preferably air pipes serving ballast tanks.
(b) Two air pipe heads, one port and one starboard, on the exposed decks serving spaces aft of 0.25L, preferably air pipes serving ballast tanks.

4.8.2 The selection of air pipe heads to be examined is left to the attending Surveyor.

4.8.3 According to the results of this examination, the Surveyor may require the examination of other heads located on the exposed decks.

4.9 Thickness measurements

4.9.1 Thickness measurements are to be carried out according to *Sec 12*.

SECTION 5
Special Survey Hull II (Age of ship 5-10 years)

5.1 General

5.1.1. The requirements of *Sec 4* for Special Survey I, are to be complied with.

5.2 Preparation

5.2.1 In addition to the requirements of *Sub 4.2* the requirements of this Subsection are to be complied with.

5.2.2 A sufficient amount of ceiling in the holds is to be lifted from bilges and the inner bottom to enable the Surveyor to satisfy himself as to the condition of the structure in bilges, the inner bottom plating, the pillar feet, the lower and plating of bulkheads and the tunnel side.

5.2.3 In ships having a single bottom, the close ceiling in holds is to be lifted to such an extent that at least 3 strakes on each side (one strake being at the bilge) and all portable hatches in holds and flooring plates in machinery and boiler spaces are to be removed for examination of the structure below. In either case the whole of the ceiling may be lifted for examination of the structure below when deemed necessary by the Surveyor.

5.2.4 Structural parts behind insulations are to be examined as required by the Surveyor.

5.2.5 Chain cables are to be ranged out and examined, and chain lockers are to be examined internally.

5.3 Examination and testing of tanks

5.3.1 In addition to the requirements of *Subs 4.4* and *4.5* the requirements of this Subsection are to be complied with.

5.3.2 All **seawater ballast tanks** are to be internally examined (see also *4.4.2 – 4.4.3*).

5.3.3 At least one **integral fresh water tank** is to be examined internally. The remaining fresh water tanks may be examined externally from all accessible boundaries.

5.3.4 At least **one integral fuel oil tank**, in way of cargo length area, is to be examined internally. The remaining fuel oil tanks may be examined externally from all accessible boundaries.

5.3.5 **Lubricating oil tanks** need not be examined internally. These tanks may be examined externally from all accessible boundaries.

5.4 Automatic Air Pipe Heads

5.4.1 For all ships except for passenger ships, automatic air pipe heads are to be examined (both internally and externally) as follows :

(a) All air pipe heads, located on the exposed decks in the forward 0.25L.
(b) At least 20% of air pipe heads, on the exposed decks serving spaces aft of 0.25L, preferably air pipes serving ballast tanks.

5.4.2 The selection of air pipe heads to be examined is left to the attending Surveyor.

5.4.3 According to the results of this examination, the Surveyor may require the examination of other heads located on the exposed decks.

5.5 Thickness measurements

5.5.1 Thickness measurements are to be carried out in accordance with *Sec 12*.

SECTION 6
Special Survey Hull III (Age of ship 10-15 years)

6.1 General

5.1.1 The requirements of *Sec 5* for Special Survey II are to be complied with.

6.2 Preparation

6.2.1 In addition to the requirements of *Sub 5.2* the requirements of the present Subsection are to be complied with.

6.2.2 A sufficient amount of ceiling and lining in the holds and flooring plates in the machinery spaces is to be removed, as required by the Surveyor.

6.2.3 The ship is to be made free from rust inside and outside in order to expose for examination the framing and plating together with discharges, scuppers, air and sounding pipes, and the structure is to be examined.

6.2.4 Wood sheathing and deck composition on steel decks are to be removed as required by the Surveyor and the plating below examined.

6.2.5 Cement chocks on the ship's sides at bilges and decks are to be examined and portions of them removed so that the condition of the shell plating and adjacent steel work can be ascertained.

6.2.6 The lining in way of side scuttles is to be removed as required by the Surveyor and the shell plating examined.

6.2.7 All double bottom and other tanks are to be cleansed as necessary to permit their internal examination when required by the Surveyor.

6.2.8 Where the holds are insulated for the purpose of carrying refrigerated cargoes, the limbers and hatches are to be lifted and sufficient insulation is to be removed in each of the chambers to enable the Surveyor to satisfy himself as of the condition of the framing and plating.

6.2.9 All mast wedging is to be removed for inspection.

6.2.10 Attention is to be given by the Surveyor to the parts of the ship's structure in way of the boilers.

6.2.11 Attention is also to be paid to the possibility of local wastage and grooving, e.g. at the shell plating along the heel of framing members.

6.3 Examination and testing of tanks

6.3.1 In addition to the requirements of *Subs 4.4* and *4.5*, the requirements of this Subsection are to be complied with.

6.3.2 All **seawater ballast tanks** are to be internally examined (see also *4.4.2 – 4.4.3*).

6.3.3 A minimum of two selected **integral oil fuel tanks**, in way of cargo length area and one **integral oil fuel tank**, in way of engine room, are to be examined internally. The remaining tanks may be examined externally from all accessible boundaries.

6.3.4 One **integral deep tank for fuel oil** in the cargo length area is to be included, if fitted.

6.3.5 All **integral tanks** which are used exclusively for **fresh water** are to be examined internally.

6.3.6 **Lubricating oil tanks** need not be examined internally. These tanks may be examined externally from all accessible boundaries.

6.3.7 Independent tanks in the engine room containing fuel or lubricating oil are to be filled to the top of the tank for testing.

6.4 Automatic Air Pipe Heads

6.4.1 For all ships, all air pipe heads, located on the exposed decks, are to be examined (both internally and externally).

6.5 Thickness measurements

6.5.1 Thickness measurements are to be carried out in accordance with *Sec 12*.

SECTION 7
Special Survey Hull IV (Age of ship over 15 years) and Special Surveys thereafter

7.1 General

7.1.1 The requirements of *Sec 6* for Special Survey III are to be complied with.

7.2 Examination and testing of tanks

7.2.1 In addition to the requirements of *Subs 4.4* and *4.5*, the requirements of this Subsection are to be complied with.

7.2.2 All **seawater ballast tanks** are to be internally examined (see also *4.4.2 – 4.4.3*).

7.2.3 Half of the **integral fuel oil tanks**, in way of cargo length area (minimum 2) and one **integral fuel oil tank** in way of engine room are to be examined internally. The remaining tanks may be examined externally from all accessible boundaries.

7.2.4 One **integral deep tank for fuel oil** in the cargo length area is to be included, if fitted.

7.2.5 All **integral tanks** which are used exclusively for **fresh water** are to be examined internally.

7.2.6 At least one **integral tank used for lubricating oil** is to be internally examined. The remaining tanks may be examined externally from all accessible boundaries.

7.2.7 Independent tanks which are used for fresh water, oil fuel or lubricating oil need not be examined internally subject to external examination of all accessible boundaries.

7.3 Thickness measurements

7.3.1 Thickness measurements are to be carried out in accordance with *Sec 12*.

SECTION 8
Bottom Surveys

8.1 Docking Survey

8.1.1 When a ship is in dry-dock or on a slipway, it is to be placed on sufficiently high and secure blocks and with the necessary staging to permit the examination of elements such as shell plating including bottom and bow plating, stern frame and rudder, sea chests and valves, propeller, shaft brackets and other stern appendages if fitted.

8.1.2 The shell plating is to be examined for excessive corrosion or deterioration due to chafing or contact with the ground and for any undue unfairness or buckling. Special attention is to be paid to bilge keels. Important plate unfairness or other deterioration which do not necessitate immediate repairs is to be recorded.

87.1.3 Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need to be opened out and examined during every special class survey. If it is deemed necessary by the Surveyor, valves and cocks may be opened and examined at shorter intervals.

8.1.4 Visible parts of rudder, rudder pintles, rudder shafts and couplings and stern frame are to be examined.

8.1.5 When deemed necessary by the Surveyor, the rudder is to be lifted or the inspection plates be removed for the examination of pintles. The clearance in the rudder bearings is to be ascertained and recorded.

8.1.6 The steering gear is to be subjected to an operational trial.

8.1.7 Visible parts of propeller and stern bush are to be examined. The clearance in the stern bush and the efficiency of the oil gland, if fitted, are to be ascertained and recorded.

8.1.8 For controllable pitch propellers, the Surveyor is to be satisfied with the fastenings and tightness of hub and blade sealing. Dismantling need not be carried out unless deemed necessary by the Surveyor.

8.1.9 Visible parts of side thrusters are to be examined.

8.1.10 At Docking Surveys carried out as a part of the Special Class Survey, the cross sectional area of the anchor chain cables is to be determined by measuring approximately 3 typical links per length (27.5 m) at the ends of the links in way of the maximum wear. Worn out chain lengths (over 12% from their nominal diameter) are to be renewed.

8.1.11 Bower anchors, if considerably worn, are to be weighed. If their weight is found to be reduced by 20% or more from the original they are to be replaced.

8.2 In-water Survey

8.2.1 The In-water Survey is to provide reliable information normally obtained from a Docking Survey so far as practicable.

8.2.2 Proposals for In-water Surveys (along with Owner's application) are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Society.

8.2.3 It is strongly recommended that the underwater part of the hull be protected against corrosion by a full hard coating system and be also protected by an impress current cathodic protection system.

8.2.4 The In-Water bottom inspection may not be applicable if there are outstanding recommendations for repairs to the propeller, rudder, stern frame, and underwater hull structure or sea valves.

8.2.5 The In-water Survey is to be carried out with the ship at light draught in sheltered waters. The in-water visibility is to be good and the hull below waterline is to be sufficiently clean to permit a meaningful examination. The Society is to be satisfied with the methods of localization of the divers on the plating. Use is to be made, where necessary, of permanent markings on the plating at selected points.

8.2.6 The In-water Survey is to be carried out by a Surveyor who is a skilled diver and trained to carry out the survey or by a qualified diver under surveillance by a Surveyor to I.N.S.B.. The diver has to be employed by a firm acceptable to the Society.

8.2.7 It is advisable that both the Surveyor and the diver be provided with detailed plans of the hull and hull attachments below the waterline, that is:

(a) Plans of the shell plating below waterline showing the details of the location and size of shell openings, bilge keels and location of watertight and oiltight bulkheads.
(b) Plans of anodes' distribution, including their securing arrangements.
(c) Drawings and detailed information of rudder and fittings.
(d) Drawings and detailed information of tail shaft arrangement and propeller.
(e) Drawings of stem and stern.

8.2.8 The above plans are to include the necessary instructions to facilitate the diver's work, especially for clearance measurements.

8.2.9 Suitable means of ascertaining the position and identifying each blade of propeller(s) from inboard are to be provided.

8.2.10 Sea connections are to be provided with means of blanking their openings to the sea from outboard so that they may be opened out from inboard for examination and repairs.

8.2.11 Anodes are to be attached in such a manner as to be easily replaced as necessary.

8.2.12 When professional divers are employed, the Surveyor is to be satisfied with the method of pictorial representation, and a good two-way communication between the Surveyor and divers is to be provided. The underwater pictures on the surface monitor screen are to offer reliable technical information such as to enable the Surveyor to assess the parts surveyed.

8.2.13 The Diving Report is to contain the following information:

(a) Name of diving company.
(b) Name of diver and license number.
(c) Date and place of Survey.
(d) Name of equipment used for the In-water Bottom Inspection.
(e) Name of ship.
(f) Class character and notations.
(g) Gross tonnage.
(h) Port of registry.
(i) Owner of ship.
(j) Draughts (forward and aft).
(k) Contents and results of the inspection (damage configuration and status, etc.).

8.2.14 The Diving Report must be countersigned by the attending Surveyor.

8.2.15 If the In-water Survey reveals damage or deterioration that requires early attention, the Surveyor may require that the ship be dry-docked in order that a detailed survey can be undertaken and the necessary repairs carried out.

SECTION 9
Propeller Shaft Surveys

9.1 Complete Survey

9.1.1 The following requirements are to be complied with during the Complete Survey:

(a) Propellers are to be removed and examined.
(b) Tailshafts are to be completely drawn in or out and examined. Shafts are to be carefully examined throughout, i. e.:
  (i) In way of the thread for the propeller nut.
  (ii) At the keyway.
  (iii) At the large end of the cone.
  (iv) At the ends of liner(s) where in contact with sea water.
  (v) At the junctions of the separate lengths of a liner.
  (vi) At the portion of shaft between separate lengths of liners.
  (vii) In way of couplings and their bolt holes.
(c) At the discretion of the Surveyor, the shaft is to be examined by an efficient crack detection method, usually the magnetic particle method for non-austenitic steel shafts. Such examination is to be carried out at every survey when this is required as a condition for increasing the interval between Tailshaft Surveys. In this case the crack detection examination is to be extended at least over a length from the after end of the liner (or stern tube, for shafts not fitted with liners) to a position at approximately one-third of the length of the cone from the large end, or the after flange fillet area of the shaft, if the propeller is fitted to a solid flange coupling.
(d) The various parts of the aft oil glands (if fitted) are to be examined.
(e) Bearings are to be examined.
(f) Clearances of the bearings and the wear down of the shaft, if any, are to be checked.

9.1.2 For oil lubricated arrangements all exposed areas of the after shaft area are to be examined by an approved crack-detection method without drawing of the shaft, and the following is to be found satisfactory:

(a) Clearances and wear down of the bearings.
(b) Records of lubricating oil analysis, oil consumption and bearing temperature.
(c) Visible shaft areas.

9.1.3 Lubricating oil and bearing temperature controls are to be performed as specified in *9.3.6 – 9.3.8.*

9.1.4 Where any doubt exists regarding the findings of the above, the shaft is to be sufficiently drawn to permit a complete examination.

9.2 Partial Survey

9.2.1 The Partial Survey is to consist of the propeller being backed off in any keyed shaft and the top half of the cone examined by an efficient crack detection method for which removal of the key will be required.

9.2.2 Oil gland and seals are to be examined and dealt with as necessary. Wear down is to be measured and found satisfactory.

9.2.3 Propeller and fastenings are to be examined.

9.3 Modified Survey

9.3.1 The Modified Survey will consist of a partial withdrawal of the shaft, sufficient to ascertain the condition of the stern bearing and shaft in way.

9.3.2 For keyless propellers or shafts with a solid flange connection to the propeller, a visual examination to confirm the good condition of the sealing arrangements is to be made. The oil glands are to be capable of being replaced without removal of the propeller.

9.3.3 The forward bearing and all accessible parts including the propeller connection to the shaft are to be examined so far as possible. Wear-down is to be measured and to be found satisfactory.

9.3.4 Where a controllable pitch propeller is fitted, at least one of the blades is to be dismantled for examination of the working parts and the control gear, followed by a function test after the assembling.

9.3.5 For keyed propellers, the after end of the cylindrical part of the shaft and forward 1/3 of the shaft cone is to be examined by a magnetic practicable crack detection method, for which dismantling of the propeller and removal of the key will be required.

9.3.6 Where a lubricating oil analysis is carried out regularly at intervals not exceeding 6 months and the oil consumption and bearing temperature are recorded and considered to be within permissible limits, the drawing of the shaft to expose the aft bearing contact area may be dispensed with.

9.3.7 The documentation on lubricating oil analysis is to be available on board. Each analysis is to include:

(a) Water contents.
(b) Chlorides contents.
(c) Content of bearing metal particles.
(d) Oil aging (resistance to oxidation).

9.3.8 Oil samples are to be taken under service conditions.

9.4 Maximum and minimum clearances for propeller shafts

9.4.1 The bearing clearances will depend on the material of the bearing surface, the diameter of the shaft and the means of lubrication.

9.4.2 For water-lubricated lignum vitæ bearings the recommended clearances are approximately as shown in *table 9.4.2*.

Table 9.4.2 Recommended clearances for lignum-vitæ bearings

Shaft diameter (mm)	**Minimum clearances for new bearings** (mm)	**Maximum allowed clearances** (mm)
Up to 200	0.75	6.00
Up to 305	1.00	8.00
More than 305	1.25	9.00

9.4.3 For white linings of oil lubricated stern tubes the recommended minimum clearances of new bearings are as shown in *table 9.4.3*.

Table 9.4.3 Recommended minimum bearing clearances for oil lubricated stern tubes

Shaft diameter (mm)	**Minimum clearances** (mm)
Up to 200	0.60
Up to 305	0.75
Up to 500	1.00
Up to 700	1.20
More than 700	1.25

9.4.4 When the clearance between the shaft and the bearing reaches approximately twice the value of the above mentioned clearances of new bearing, the bush must be remetalled.

9.4.5 Stern tube bearings lined with rubber or plastic are to have initial clearances in accordance with the Maker's recommendations.

9.5 Rotating and azimuth thrusters

9.5.1 The periodical survey of rotating and azimuth thrusters consists of:

(a) Removal of the propeller(s) in order to examine the following items, as applicable:

- exposed parts
- cone and keyway to be checked by an appropriate crack detection method
- sealing glands
- threaded end and nut

(b) Examination of the results of a lubricating oil analysis (water content and presence of material particles) to detect possible deterioration of internal gears and bearings.

(c) Examination of the orientation device.

If the foregoing checks are not satisfactory, dismantling of the internal parts may be required.

9.6 Vertical axis propellers

9.6.1 The periodical survey of vertical axis propeller systems consists of:

(a) Checking of the tightness of the oil glands and the backlash of the gears from outside by action on the blades

(b) Checking the condition of gears and couplings from inside the vessel

(c) Examination of the results of a lubricating oil analysis (water content and presence of material particles) to detect possible deterioration of internal gears and bearings.

If the foregoing checks are not satisfactory, dismantling of the internal parts may be required.

SECTION 10
Special Survey Machinery

10.1 General

10.1.1 Special Survey of machinery is to be carried out at the same time and intervals as required for hull and equipment with respect to the type of machinery.

10.1.2 For machinery and electrical equipment, in addition to the requirements for the Intermediate Survey, the following requirements are to be complied with.

10.2 Survey of main and auxiliary engines

10.2.1 At the Special Survey of main engines, the following requirements are to be complied with in accordance with the type of engine.

10.2.2 Where deemed necessary by the Surveyor, control, governing and safety devices are to be tested.

10.2.3 For **oil engines** the following is to be performed:

(a) Cylinders, cylinder covers, pistons, piston rods and connecting rods, cross-heads (including pins, bearings and guides) are to be opened out and examined.
(b) Crank shafts and all bearings, cam shafts and their driving gears are to be opened out and examined.
(c) Essential valves and valve arrangements, fuel oil pumps and fittings, scavenging pumps, scavenging blowers, superchargers, intercoolers, filters or oil separators and safety devices are to be opened out and examined.
(d) Clutches and reverse gear are to be opened out and examined.
(e) Crank cases and explosion relief devices are to be opened out and examined.
(f) Deflections of crank arms are to be measured.
(g) Vibration dampers or balancers are to be examined.

10.2.4 For **steam turbines** the following is to be accomplished:

(a) Turbine blades, rotors, stop valves, shafts, glands, thrust adjusting bearings, oil drains, and sealing pipes are to be opened out and examined.
(b) At Special Survey No. 1 only, for vessels having more than 1 main propulsion ahead turbine with emergency steam crossover arrangement, the turbine casings need not be opened provided that approved vibration indicators and rotor position indicators are fitted and that the operating records are considered satisfactory by the Surveyor.
(c) An operational test of the turbines may be required when deemed necessary by the Surveyor.

10.2.5 For the **main electric propelling machinery**, windings, commutators and slip-rings, all air ducts in stator coils and ventilating holes in rotors are to be examined.

10.2.6 For **auxiliary engines**, the requirements corresponding to those of the main engine are to be complied with.

10.3 Survey of machinery other than main and auxiliary engines

10.3.1 All shafts (except the propeller and stern tube shafts), thrust blocks and line shaft bearings are to be examined. The lower halves of bearings need not be exposed, if alignment and wear are found satisfactory.

10.3.2 Reduction gear is to be examined. Where deemed necessary by the Surveyor, reduction gear is to be opened out and the gear wheels, pinions, gear shafts and bearings are to be examined.

10.3.3 The foundation bolts and chocks of main and auxiliary engines, gear casings, thrust blocks and line shaft bearings are to be examined.

10.3.4 An examination of machinery driven by the main engine and the engine fittings is to be carried out.

10.3.5 All air receivers and other pressure vessels for essential services together with their mountings and safety devices are to be opened out and examined internally and externally. Where internal examination is not practicable, they are to be tested hydraulically to **1.5 times** the working pressure and, if deemed necessary by the Surveyor, a performance test of safety valves for the above mentioned devices is to be carried out.

10.3.6 Air compressors with their inter-coolers, filters and/or oil separators and safety devices, and all pumps and components used for essential services are to be opened out as deemed necessary by the Surveyor and examined.

10.3.7 Operational conditions of steering gear are to be examined. Where deemed necessary by the Surveyor, main parts are to be opened out and examined.

10.3.8 Remote control systems of main engines and controllable pitch propellers are also to be tested in operation (special attention is to be given to the reverse mechanism).

10.3.9 Operating conditions of windlass, mooring winches and cargo winches are to be examined. Where deemed necessary by the Surveyor, main parts of them are to be opened out and examined.

10.3.10 Evaporators are to be opened out and examined. Their safety valves are to be checked under working conditions.

10.3.11 During the Special Survey of **heat exchangers** the following is to be performed:
(a) An internal examination is to be carried out,
(b) A hydraulic test will be required depending on the result of the examination and after repairs of the heat exchanger.

10.3.12 For **pumping and piping arrangements** the following is to be carried out:
(a) Valves, cocks and strainers of the bilge system including the emergency bilge suction valve are to be examined and, where deemed necessary by the Surveyor, they are to be opened out.
(b) Fuel oil, feed and lubricating oil systems, ballast connections and blanking arrangement to deep tanks which may carry liquid or dry cargoes, together with all filters, heaters, coolers and condensers for essential services are to be opened out and examined. Pressure tests may be carried out, including safety devices, where deemed necessary by the Surveyor.

10.3.13 Where deemed necessary by the Surveyor, performance tests of pressure gauges, revolutions and thermometers are to be carried out.

10.3.14 Spare parts of main and auxiliary engines are to be available on board according to the requirements of the Rules.

10.3.15 Where essential machinery is fitted with automatic and remote controls these are to be tested to demonstrate that they are in good working order. Special attention must be given to the proper operation of remote stopping systems of transfer pumps, fuel oil heating pumps, forced draught fans and engine room ventilation fans.

10.3.16 Operation tests of engine room alarm system, including alarm system in the engineer's accommodation, are to be carried out.

10.3.17 An examination of ventilation ducts passing through watertight bulkheads and fire-resisting bulkheads is to be carried out.

10.3.18 An examination of cables and cable penetrations in watertight and fire-resistant bulkheads is to be carried out.

10.4 Survey of electrical equipment

10.4.1 Main and emergency switchboards, section panels, and distribution fuse panels are to be examined and overcurrent protective devices and fuses inspected to verify that they provide suitable protection for their respective circuits.

10.4.2 Generators are to be tested under load conditions, either separately or in parallel and the performance of speed governors, switches and circuit breakers is to be checked.

10.4.3 Emergency sources of electrical power are to be tested, including:
(a) Operation test of emergency generating set.
(b) Test of emergency accumulators.

10.4.4 Battery chargers are to be tested.

10.4.5 Mechanical ventilation of battery rooms / lockers is to be examined.

10.4.6 The insulation resistance of generators, switchboards, motors, cables and other electrical equipment is to be tested and adjusted if it is found not to comply with the requirements given below:
(a) For main and emergency switchboard, feeder circuit breakers being open, busbar circuit closed, measuring and monitoring instruments disconnected, the insulation resistance measured across each insulated busbar and hull, and across insulated busbars is not to be less than **1MΩ**.
(b) For generators, the equipment and circuits normally connected between the generator and the first circuit breaker being connected, the resistance of insulation (preferably at working temperature whenever possible), in ohms, is to be greater than 1000 times the rated voltage, in volts. When appropriate, the Surveyor will check also that the insulation resistance of generator independent exciters is not less than **0.25 MΩ**.
(c) The insulation resistance of the entire electrical system is to be checked with all circuit breakers and protective devices closed, except for generators. In general, the resistance is not to be less than **0.1MΩ**.

(d) The variation of the resistance with time is to be checked, comparing the current figure with previous readings. If the insulation resistance has dropped suddenly or is not sufficient, the defective circuits are to be traced, disconnecting as much circuits as necessary.

However, this test may be dispensed with if it is found that the measured records remain efficient and they comply with the above requirements.

10.4.7 The lighting arrangements, internal communication and signalling systems, mechanical ventilation systems, and other electrical equipment are to be tested for effectiveness.

10.4.8 The electrical supply of navigation lights and associated alarm and signal devices is to be tested.

10.5 Fire-fighting equipment

10.5.1 The entire fire-fighting equipment is to be thoroughly examined, and to be confirmed that is ready for operation. Details: as per section 2.3.3 of this chapter.

10.5.2 Emergency escapes / exits are to be inspected.

SECTION 11
Periodical Surveys and testing of machinery items

11.1 Steam boilers

11.1.1 External inspection

11.1.1.1 The operability and general condition of the entire boiler, including its valves and fittings, pumps, piping, insulations, foundation, control and regulation systems, and its protective and safety equipment, is to be checked.

11.1.1.2 The boiler manual and operating instructions are to be checked.

11.1.2 Internal inspection

11.1.2.1 Where deemed necessary by the Surveyor, the boiler is to be cleansed on the water and fuel gas sides, and, if required, its outside surfaces are to be exposed as well, so that all walls subject to pressure may be examined.

11.1.2.2 Where the design of the boiler does not permit an adequate internal inspection, hydraulic tests may be required. It is left to the Surveyor's discretion to have the internal inspection supplemented by hydraulic tests, if required on account of the condition of the boiler.

11.1.2.3 Where doubts arise concerning the thickness of the boiler walls, it is to be ascertained by means of a recognized gauging method. On the basis of the results of such inspection the allowable working pressure (**PB**) at which the boiler may be operated in future is to be decided on.

11.1.2.4 The hydraulic pressure test is to be carried out to a test pressure of 1.3 PB. Only after repair of major damages the test pressure may be **1.5 PB**. In no case, however, is the test pressure to be less than **PB + 1 bar**, and it is not to exceed the test pressure applied during the first inspection of the boiler after completion.

11.1.2.5 In addition to the above periodical inspections the Surveyor may, at his own discretion, require hydraulic tests or extraordinary surveys to be performed, e. g. following repairs and maintenance work.

11.2 Pressure vessels

11.2.1 Subject to the provisions of *Ch 2, Sub 5.8* pressure vessels are to be inspected internally and externally.

11.2.2 **Supplementary testing:** Where pressure vessels cannot be satisfactorily examined internally and where their unobjectionable condition cannot be clearly recognized during the internal inspection, recognized non-destructive test methods are to be applied and/or hydraulic pressure tests are to be carried out. The hydraulic pressure test is to be carried out at a test pressure of **1.5 PB**. However, the test pressure must not be less than PB + 1 bar.

11.3 Carbon dioxide low-pressure fire-extinguishing systems and Halon tanks

11.3.1 The surfaces are to be checked for corrosion at the Surveyor's discretion.

11.3.2 Insulated vessels are to be exposed at some selected points, such as to offer a general impression of the vessel's external condition.

11.3.3 Following a hydraulic pressure test, the vessels and/or bottles are to be carefully dried. In the case of vessels for powder extinguishing agents, periodical pressure tests may be dispensed with, provided that their internal inspection does not reveal any deficiencies.

SECTION 12
Thickness Measurements

12.1 General

12.1.1 The purpose of thickness measurements described in the Rules is to prevent vessels from hull casualties. Information provided in the report of hull thickness measurements for a vessel in service indicates that the vessel is maintaining sufficient local and global strength. If necessary, renewal/repair works can be made accordingly. Therefore, Thickness Measurements Reports giving information for the assessment of hull strength (including watertight integrity) as well as for the maintenance of the hull should be carefully considered.

12.1.2 Thickness measurements are to be carried out by a qualified company, certified by I.N.S.B.. Validity of the approval granted will depend on the continued qualification.

12.1.3 Thickness measurements are normally to be carried out under the surveillance of the attending Surveyor to I.N.S.B.. When it is necessary, as a part of a Periodical Survey, to carry out Thickness Measurements for structural areas subject to close-up survey, these measurements are to be carried out simultaneously with the close-up survey.

12.1.4 The extent of thickness measurements on the occasion of Special Class Surveys is given in *Table A*.

12.1.5 Where substantial corrosion is found, additional thickness measurements are to be carried out in accordance with *Table E*.

12.1.6 Transverse sections should be chosen (at least one within 0.5*L* amidships) where largest corrosion rates are suspected to occur or revealed by deck plating measurements. The average reduction in transverse sections should not exceed the maximum reduction as indicated in *Table D*.

12.1.7 Thickness Measurement Reports stated in *12.1.1* must be signed by the Operator. The Surveyor is to review/verify the thickness measurements and countersign the report for acceptance. The Report form shown in *Table B* or an equivalent may be used.

12.1.8 Where thickness measurements result in corrosion and wear values exceeding those stated in *Tables C* and *D*, inspections are to be carried out in detail and corresponding hull structural members are to be renewed by the date considered by the Society.

12.1.9 In order to be used as a basis for class renewal, thickness measurements should, as far as practicable, be carried out already on the occasion of the 4th Annual Survey.

12.1.10 All paint and rust are to be entirely removed before the plates are gauged. In all cases where gauged plates are renewed the thickness of adjacent plates in the same strakes are to be reported.

12.1.11 Where the structure is suitable coated and if the coating is in good condition the Surveyor may, at his discretion and upon approval of I.N.S.B. Head Office, accept a reduced program of thickness measurements in the corresponding areas. Other effective protective arrangements may also be considered.

12.1.12 Where the holds are insulated for the purpose of carrying refrigerating cargoes, the limbers and hatches are to be lifted and sufficient additional insulation is to be removed in each of the chambers, to enable the Surveyor to satisfy himself as of the condition of the steel structure and to enable the thickness of the steel plating to be ascertained.

12.1.13 Thickness of plating and structure in way of cement is to be ascertained unless the Surveyor, after a thorough examination, considers this as unnecessary. A selected portion of the cement is to be removed if required by the Surveyor.

12.1.14 The Surveyor may accept thickness measurements not carried out under his supervision. In this case the Surveyor should re–check the measurements for accuracy as deemed necessary.

12.1.15 Upon completion of the necessary thickness measurements an appropriate Report is to be prepared. The Report is to give the following details:
(a) Location of measurements.
(b) Thickness measured.
(c) The corresponding original thickness.
(d) Date when the measurements were carried out.
(e) Type of measuring equipment.
(f) Name and the qualification of the operators.

12.1.16 When partial corrosion occurs in stress concentrated parts, partial replacement or reinforcement is to be carried out regardless of *Tables C* and *D*.

12.1.17 Additional details on thickness measurements for special ship types are given in *Chapter 5*.

TABLE A Thickness measurements during Special Surveys

Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear
	Within the cargo length area or 0.5*L* amidships: – Selected deck plates – 1 transverse section – Selected tank top plates – Selected bottom plates – Selected wind and water strakes	Within the cargo length area or 0.5*L* amidships: – Each deck plate – 2 transverse sections – Selected tank top plates – Selected bottom plates – All wind and water strakes	Within the cargo length area or 0.5*L* amidships: – Each main deck plate – 3 transverse sections – Each tank top plate – Each bottom plate – Selected wind and water strakes
	Outside the cargo length area or 0.5*L* amidships: – Selected deck plates – Selected wind and water strakes – Selected bottom plates	Outside the cargo length area or 0.5*L* amidships: – Selected deck plates – Selected wind and water strakes – Selected bottom plates	Outside the cargo length area or 0.5*L* amidships: – Each main deck plate – All wind and water strakes – Each bottom plate
	The two first cargo hold hatch covers and coamings (plates and stiffeners)	All cargo hold hatch covers and coamings (plates and stiffeners)	All cargo hold hatch covers and coamings (plates and stiffeners)
	Collision bulkhead, forward machinery space bulkhead, aft peak bulkhead	Collision bulkhead, forward machinery space bulkhead, aft peak bulkhead, selected cargo hold transverse and longitudinal bulkheads (plates and stiffeners)	All transverse and longitudinal bulkheads (plates and stiffeners)
		Selected internal structural members such as floors and longitudinals, transverse frames, web frames, deck beams, tweendecks, girders, etc	As for Special Survey III. Number of measurements may be increased as deemed necessary by the Surveyor

Notes :

(a) Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.

(b) For ships less than 100 meters in length, the number of transverse sections required at Special Survey III may be reduced to one (1), and the number of transverse sections required at Subsequent Special Surveys may be reduced to two (2).

(c) For ships more than 100 meters in length, at Special Survey III, thickness measurements of exposed deck plating within amidship 0.5 L may be required.

TABLE B Thickness Measurement Report (Sample)

Plate Position	Original Thickness	Maximum allowable diminution (mm)	Present thickness (gauged)			Diminution	
			1	2	Average	nm	%

TABLE C Maximum reduction of individual plates and stiffeners

Structural item		Category 1 ships	Category 2 & 3 ships
Hull envelope, individual plates, shell and deck plating recorded along the strake (deck, bottom, wind and water)		20%	30%
Longitudinal structural members	Plating	20%	30%
	Stiffeners	25%	25%
Transverse structural members in cargo oil and water ballast tanks		20%	25%
Watertight and oiltight transverse bulkheads (including deep tanks bulkheads)	Plating	25%	30%
	Stiffeners and corrugated bulkhead plating	25% (See Note 1)	25%
Miscellaneous structural members (including deck plates inside line of openings)	Plating	25%	30%
	Stiffeners	25%	25%
Cargo hold transverse frames and end brackets		20%	25%

NOTES:
1. For dry bulk cargo ship transverse bulkheads of corrugated construction the maximum allowable reduction is as follows:
   a) Cargo hold designed to be completely filled with salt water ballast (deep tank): **25%**
   b) Cargo hold designed to be partially filled with salt water ballast and aft transverse bulkhead of cargo hold No.1: **15%**
   c) Remaining cargo hold transverse bulkheads: **20%**
2. For definition of ship categories see *Table D Note 5*.
3. The maximum reduction is for the average thickness measured over the plate area or over the length between supports.

TABLE D Maximum reduction of topside and bottom areas (Transverse sections)

Structural item		Category 1 ships		Category 2 ships		Category 3 ships	
		Over 0.5*L* amidships	At 0.075*L* from ends	Over 0.5*L* amidships	At 0.075*L* from ends	Over 0.5*L* amidships	At 0.075*L* from ends
Topside areas	Plating	10%	20%	10%	30%	15%	30%
	Longitudinals	15%	25%	15%	25%	20%	30%
Bottom areas	Plating/Single bottom construction	10%	20%	10%	30%	15%	30%
	Plating/Double bottom construction	15%	20%	15%	30%	20%	30%
	Longitudinals	15%	25%	15%	25%	20%	30%

NOTES:

1. Intermediate values are to be obtained by linear interpolation.
2. Topside area comprises deck (outside line of openings for dry cargo ships) stringer and sheer strake (including rounded gunwales) together with associated longitudinals.
3. Bottom area comprises keel, bottom and bilge plating together with associated longitudinals.
4. For ships of Categories 1 and 2 a greater reduction may be permitted over 0.5*L* amidships provided that the hull girder section modulus – using the actual gauged thickness – is not less than 90% of the Rules' section modulus for the new ship. A reassessment of scantlings would be required where this consideration is requested.
5. Ship categories are as follows:
   Category 1: Oil Tankers, Chemical Tankers, Dry Bulk Cargo Ships, Combination Carriers and liquefied gas ships having a length $L \geq 90$ metres.
   Category 2: All remaining ship types not included in Category 1 and having length $L \geq 90$ metres.
   Category 3: All ship types having a length $L < 90$ metres.
6. Where the reduction of topside or bottom area (plating and longitudinals) is in excess of 0.75 of the values given herein, additional transverse sections are to be measured as recommended by the Surveyor.
7. The maximum reduction is for the average reduction measured on plates or longitudinals in way of topside or bottom areas at transverse sections.

TABLE E Guidance for additional thickness measurements in way of substantial corrosion

Structural member	Extent of measurement	Pattern of measurement
Plating	Suspect area and adjacent plates	Five-point pattern over 1 square metre
Stiffeners	Suspect area	Three measurements in line across each flange and web

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Section

1 General requirements

SECTION 1
General requirements

1.1 Surveys of Laid-up ships

1.1.1 At Owner's request ships may be submitted to a Laying-up survey and Annual Condition Surveys during laying up period.

1.1.2 In such a case, the class of the ship will be considered maintained in laid up condition for the lay-up period.

1.1.3 During the Annual Condition Survey for laid-up ships the following items are to be examined to the Surveyor's satisfaction:

(a) Region of laying-up.
(b) Mooring / anchoring equipment.
(c) Condition of the vessel regarding trim and stability.
(d) Main and emergency sources of electric power.
(e) Propulsion arrangement.
(f) Auxiliary machinery items (especially bilge pumps).
(g) Condition of hull.
(h) Fire fighting means (fixed, portable, semi portable systems).
(i) Means of communication with shore-stations.
(j) Anchor lights.
(k) Special items as deemed necessary by the Society for special ship types.

1.1.4 Surveys other than the Annual Condition Surveys, becoming due during the lay-up period will be postponed until the time of recommissioning. At this time, the ship is to be submitted to all postponed surveys.

1.1.5 The Society reserves the right to carry out sea trials and/or recommissioning trials of specific installations and/or components depending on the duration of the lay-up period.

1.2 Damage and Repair Surveys

1.2.1 In the event of grounding or other damage to the ship's hull, machinery and electric generating plant which affects the class, the Owner of the ship or his representative is to apply to the Society for a survey to be performed. Such an application is to be made as soon as possible and the damaged parts are to be made accessible for inspection in such a way that the kind and extend of damage can be thoroughly examined and the necessary repairs to be ascertained.

1.2.2 Where parts are damaged or worn to such an extent that they no longer comply with the requirements of the Rules, they are to be repaired or replaced. In case of grounding a Docking Survey or, alternatively, an In-water Survey will be required.

1.2.3 Repairs made to ships are to be carried out with the attendance of the Surveyor as deemed necessary. When the repairs are completed to his satisfaction, the Surveyor will endorse the relevant Certificate of Class.

1.2.4 If, on account of special circumstances, repairs cannot be completed and the Surveyor considers that postponing certain repairs or accepting provisional repairs for a certain period of time enables the class to be retained provisionally, he endorses the Certificate of Class with a suitable recommendation. In general, a confirmation of class with recommendations, e.g. in case of preliminary repair, requires approval by I.N.S.B. Head Office.

1.2.5 If, after satisfactory repairs, the Surveyor considers that certain repairs must be re-examined after a certain period of time in order for the class to be retained, he will endorse the Certificate of Class with a suitable recommendation.

1.2.6 Before the due date for recommendations to be dealt with, it is the Owner's responsibility – or his representative's – to apply to the Society in order the permanent repairs to be surveyed or repairs to be re-examined according to the recommendations endorsed on the Certificate of Class.

1.2.7 When repairs are completed or re-examined to the Surveyor's satisfaction, he will endorse the Certificate of Class for the deletion of the recommendations.

1.3 Surveys after modifications and maintenance repairs

1.3.1 In the event of modifications or maintenance repairs which affect or may affect the class, the Owner of the ship or his representative is to apply to the Society for the survey of the ship while modifications or repairs are being made.

1.3.2 Should the modifications and/or repairs not be carried out to the Surveyor's satisfaction, immediately or at an agreed later date, the class may be subjected to a withdrawal procedure.

1.3.3 Maintenance work and conversions of classed ships and special equipment are to be carried out under the I.N.S.B. survey to ensure maintenance or reassignment of class.

1.3.4 If, following major conversions, a new character of class and/or new notations are assigned so that a new Certificate of Class has to be issued, commencement of a new period of class may be agreed upon.

1.3.5 When it is intended to carry out surveys for the alterations or modifications, plans and documents equivalent to those for a New Construction Survey are to be submitted to the Society for approval before the commencement of the works.

1.4 Unscheduled Surveys

1.4.1 All classed ships are to be subjected to Unscheduled Surveys when they fall under either one of the following conditions at periods other than those of Special, Intermediate or Annual Surveys:

(a) When whole or a part of machinery are about to be shifted.
(b) When load lines are required to be changed or to be newly marked.
(c) If necessary, when the due dates of surveys are to be postponed.
(d) If necessary, when ship is engaged on carrying dangerous goods and/or other special cargoes. In this regard the Society may request to apply, in addition to its Rules, the relevant International Conventions and other regulations as deemed appropriate.
(e) If necessary, when the ship is found defective in respect of either its structure or its equipment, as a result of an Inspection of Port State Control and the defects are related to the class of the ship. It is the Owner’s responsibility to report immediately the outcome of this inspection of Port State Control to I.N.S.B..
(f) Other cases where Unscheduled Surveys are required by I.N.S.B. Head Office or whenever an Unscheduled Survey is deemed necessary by the Surveyor.

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Section

1 General

2 Hull Surveys of General Cargo Ships carrying Solid Bulk Cargoes

3 Hull Surveys of Bulk Carriers

4 Hull Surveys of Oil Tankers

SECTION 1
General

1.1 Application

1.1.1 The requirements of the present Chapter apply to surveys of hull structure and piping systems in way of the cargo holds/tanks, cofferdams, pipe tunnels, void spaces within the cargo area and all ballast tanks. The present requirements are additional or supersede those stipulated by the classification requirements applicable to the remaining types of ships.

1.1.2 The present Chapter contains the minimum extent of examination, thickness measurements and tank testing. The Survey is to be extended when substantial corrosion and/or structural defects are found and is to include an additional Close-up Survey when necessary.

1.2 Definitions and explanations

1.2.1 For the purpose of this Chapter the definitions given below will apply.

Bulk Carrier: A ship which is constructed generally with single deck, topside tanks and hopper side tanks in cargo spaces, is intended primarily to carry dry cargo in bulk and includes combination carriers.

Double Skin Bulk Carrier : A Double Skin Bulk Carrier is a ship which is constructed generally with single deck, double bottom, top-side tanks and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk, including such types as ore carriers and combination carriers, in which all cargo holds are bounded by a double-side skin.

Oil Tanker: A ship constructed primarily to carry oil in bulk, and includes ship types such as combination carriers (ore/oil and ore/bulk/oil ships).

Double Hull Oil Tanker: A Double Hull Oil Tanker is a ship which is constructed primarily for the carriage of oil in bulk, 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.

Cargo length area: That part of the ship which includes all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces.
For Oil Tankers, including Double Hull Oil Tankers, cargo area is the part of the ship which contains cargo tanks, slop tanks and cargo/ballast pump-rooms, cofferdams, ballast tanks and void spaces adjacent to cargo tanks and also areas throughout the entire length and breadth of the part of the ship over the above mentioned spaces.

Overall Survey: A survey intended to report on the overall conditions of the hull structure and determine the extent of additional close-up surveys.

Close-up Survey: A survey where the details of structural components are within the close visual inspection range of the Surveyor i.e. normally within reach of hand.

Ballast tank: A tank that is being used primarily for salt water ballast, or where applicable, a space used for both cargo and salt water ballast will be treated as a ballast tank when substantial corrosion has been found in that space.
For Double Skin Bulk Carriers, a **Double Side Tank** is to be considered as a separate tank even if it is in connection to either the topside tank or the hopper side tank.

A **Combined Cargo/Ballast Tank** (applicable to Oil Tankers) is a tank which is used for the carriage of cargo or ballast water as a routine part of the vessel's operation and will be treated as a ballast tank. Cargo tanks in which water ballast might be carried only in exceptional cases per MARPOL I/18(3), are to be treated as cargo tanks.

Spaces: Spaces are separate compartments including holds tanks, cofferdams and void spaces, bounding cargo holds, decks and the outer shell.

Representative spaces or **tanks:** Spaces which are expected to reflect the condition of other spaces/tanks of similar type and service and with similar corrosion protection systems. When selecting representative spaces/tanks account should be taken of the service and repair history on board and identifiable critical and/or suspect areas.

Suspect areas: Locations showing substantial corrosion and/or are considered by the Surveyor to be prone to rapid wastage.

Critical Structural Area: Critical structural areas are locations which have been identified from calculations to require monitoring or from the service history of the subject ship or from similar or sister ships (if available) to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

Substantial corrosion: An extent of corrosion such that assessment of corrosion pattern indicates wastage in excess of 75% of allowable margins, but within acceptable limits.

Transverse Section is the cross section of the hull perpendicular to the ship's center line and includes all longitudinal members such as plating, longitudinals and girders at the deck, sides, bottom, inner bottom and hopper

side plating, longitudinal bulkheads and bottom plating in top wing tanks.

An Oil Tanker's **Transverse Section** includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and longitudinal bulkheads.

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

A ***corrosion prevention system*** is normally considered either:
(a) A full hard coating.
(b) A full hard coating supplemented by anodes.
A ***protective coating*** should usually be epoxy coating or equivalent. Other coating systems may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the manufacturer's specifications.

The ***coating condition*** is defined as follows:

(a) GOOD condition with only minor spot rusting.
(b) FAIR condition with local breakdown at edges of stiffeners and welded connection and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition.
(c) POOR condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

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

Prompt and Thorough Repair: A Prompt and Thorough Repair is a permanent repair completed at the time of survey to the satisfaction of the Surveyor, therein removing the need for the imposition of any associated condition of classification, or recommendation.

Pitting Corrosion: Pitting corrosion is defined as scattered corrosion spots/areas with local material reductions which are greater than the general corrosion in the surrounding area.

Edge corrosion: Edge corrosion is defined as local corrosion at the free edges of plates, stiffeners, primary support members and around openings.

Grooving Corrosion: Grooving corrosion is typically local material loss adjacent to weld joints along abutting stiffeners and at stiffener or plate butts or seams.

Convention: means the International Convention for the Safety of Life at Sea 1974, as amended.

1.3 Repairs

1.3.1 Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which affects or, in the opinion of the Society, will affect the ship's structural, watertight or weathertight integrity, should be promptly and thoroughly repaired.
Areas to be considered, regarding the type of ship, include:
(a) side structure and side plating;
(b) side shell frames, their end attachments or adjacent shell plating.
(c) deck structure and deck plating;
(d) bottom structure and bottom plating;
(e) inner bottom structure and inner bottom plating;
(f) inner side structure and inner side plating;
(g) watertight or oiltight bulkheads;
(h) hatch covers or hatch coamings; and
(i) Bunker and vent piping systems, including ventilators (applicable to Single and Double side Skin Bulk Carriers).
For locations where adequate repair facilities are not available, the Society may allow the ship to proceed directly to a repair facility. This may require discharging the cargo and/or temporary repairs for the intended voyage.

1.3.2 Additionally, when a survey results in the identification of corrosion or structural defects, either of which, in the opinion of the Society, will impair the ship's fitness for continued service, remedial measures should be implemented before the ship continues in service.

1.4 Surveyors

1.4.1 For Bulk Carriers or Oil Tankers, of 20,000 tons deadweight and above, two surveyors should jointly carry out the first scheduled Special Survey after the vessel passes 10 years of age (i.e. third renewal survey), and all subsequent renewal surveys and intermediate surveys.

1.4.2 On Bulk Carriers of 100,000 tons deadweight and above, the intermediate survey between 10 and 15 years of age should be performed by two surveyors.

1.5 Survey Programme (applicable to Bulk Carriers and Oil Tankers)

The owner in cooperation with the Society should work out a specific survey programme prior to the commencement of any part of:
(a) the special survey; and
(b) the intermediate survey for ships over 10 years of age.

The survey should not commence until the survey programme has been agreed.

1.5.1 Prior to the development of the survey programme, the survey planning questionnaire should be completed by the owner, and forwarded to the Society.

1.5.2 The survey programme at intermediate survey may consist of the survey programme at the previous special survey supplemented by the condition evaluation report of that special survey and later relevant survey reports. The survey programme should be worked out taking into account any amendments to the survey requirements after the last special survey carried out.

1.5.3 In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, holds, areas and structural elements to be examined:

Bulk Carriers and Double-Side Skin Bulk Carriers

(a) Survey status and basic ship information;
(b) Documentation on board, as described in *1.11*;
(c) Main structural plans (scantlings drawings), including information regarding use of high-tensile steels (HTS);
(d) Relevant previous survey and inspection reports from both the classification society and the owner;
(e) Information regarding the use of ship's holds and tanks, typical cargoes and other relevant data;
(f) Information regarding corrosion prevention level on the new building; and
(g) Information regarding the relevant maintenance level during operation.

Oil Tankers and Double Hull Oil Tankers

(a) survey status and basic ship information;
(b) documentation on board, as described in *1.11*;
(c) main structural plans of cargo and ballast tanks (scantlings drawings), including information regarding use of high-tensile steels (HTS);
(d) Condition Evaluation Report;
(e) relevant previous damage and repair history;
(f) relevant previous survey and inspection reports from both the recognized organization and the owner;
(g) cargo and ballast history for the last 3 years, including carriage of cargo under heated conditions;
(h) details of the inert gas plant and tank cleaning procedures;
(i) information and other relevant data regarding conversion or modification of the ship's cargo and ballast tanks since the time of construction;
(j) description and history of the coating and corrosion protection system (including anodes and previous class notations), if any;
(k) inspections of the owner's personnel during the last three years with reference to structural deterioration in general, leakages in tank boundaries and piping and condition of the coating and corrosion protection system (including anodes) if any;
(l) information regarding the relevant maintenance level during operation, including port State control reports of inspection containing hull related deficiencies, safety management system non-conformities relating to hull maintenance, including the associated corrective action(s); and
(m) any other information that will help identify suspect areas and critical structural areas.

1.5.4 The submitted survey programme should account for and comply, as a minimum, with the requirements for close-up survey, thickness measurement and tank testing, respectively, and is to include relevant information including at least:

(a) basic ship information and particulars;
(b) main structural plans (scantling drawings), including information regarding use of high-tensile steels (HTS);
(c) plan of holds and tanks;
(d) list of holds and tanks with information on use, protection and condition of coating;
(e) conditions for survey (e.g. information regarding hold and tank cleaning, gas-freeing, ventilation, lighting, etc.);
(f) provisions and methods for access to structures;
(g) equipment for surveys;
(h) identification of holds and tanks and areas for close-up survey;
(i) identification of areas and sections for thickness measurement;
(j) identification of tanks for testing;
(k) identification of the thickness measurement company;
(l) damage experience related to ship in question;
(m) critical structural areas and suspect areas, where relevant.

1.5.5 The Society will advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

1.6 Conditions for survey

1.6.1 The Owner is to provide the necessary facilities for a safe performance of the survey.

1.6.2 In order to enable the attending surveyors to carry out the survey, provisions for proper and safe access are to be agreed between the owner and the Classification Society.

1.6.3 Details of the means of access are to be provided in the survey planning questionnaire.

1.6.4 In cases where the provisions of safety and required access are judged by the attending surveyors not to be adequate, the survey of the spaces involved is not to proceed.

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

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

1.6.7 Sufficient illumination is to be provided to reveal significant corrosion, deformation, fractures, damages or other structural deterioration.

1.6.8 Where soft or semi-hard coatings have been applied, safe access is to be provided for the surveyor to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures which may include spot removal of the coating. When safe access cannot be provided, the soft or semi-hard coating is to be removed.

1.6.9 The Surveyor(s) are to always be accompanied by at least one responsible person, assigned by the owner, experienced in tank and enclosed spaces inspection. In addition a backup team of at least two experienced persons is to be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team is to continuously observe the work in the tank or space and is to keep lifesaving and evacuation equipment ready for use.

1.6.10 A communication system is to be arranged between the survey party in the spaces under examination and the responsible officer on deck and, as the case may be, the navigation bridge. The communication arrangements are to be maintained throughout the survey.

1.7 Access to structures

1.7.1 Regarding accessibility to spaces, absence of gases, removal of residual cargo and rust, and in respect of lighting, the ship is to be prepared such as to enable her to be duly examined without any risk.

1.7.2 Where soft coating has been applied, it may be necessary to remove this coating, at least partially.

1.7.3 For Close-up surveys in cargo holds, cargo tanks and sea water ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

(a) Permanent staging.
(b) Passages through structures.
(c) Temporary staging, e. g. ladders.
(d) Lifts and movable platforms.
(e) Boats or rafts.
(f) Other equivalent means.

1.7.4 For Close-up surveys of the cargo hold shell frames of Bulk Carriers less than 100,000 dwt, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

(a) permanent staging and passages through structures;
(b) temporary staging and passages through structures;
(c) portable ladder restricted to not more than 5 m in length may be accepted for surveys of lower section of a shell frame including bracket;
(d) hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms;
(e) boats or rafts provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water;
(f) other equivalent means.

1.7.5 For Close-up surveys of the cargo hold shell frames of Bulk Carriers 100,000 dwt and above, the use of portable ladders should not accepted, and one or more of the following means for access, acceptable to the surveyor, is to be provided:

Annual Surveys, Intermediate Survey under 10 years of age and first Special Survey

(a) permanent staging and passages through structures;
(b) temporary staging and passages through structures;
(c) hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms;
(d) boats or rafts provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water;
(e) other equivalent means.

Subsequent Intermediate Surveys and Special Surveys:

(a) Either permanent or temporary staging and passage through structures for close-up survey of at least the upper part of hold frames;
(b) Hydraulic arm vehicles such as conventional cherry pickers for surveys of lower and middle part of shell frames as alternative to staging;
(c) lifts and movable platforms;
(d) boats or rafts provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water;
(e) other equivalent means.

1.8 Equipment for survey

1.8.1 Thickness measurements are normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to the Surveyor's satisfaction.

1.8.2 One or more of the following fracture detection procedures may be required if deemed necessary by the Surveyor:

(a) Radiographic equipment.
(b) Ultrasonic equipment.
(c) Magnetic particle equipment.
(d) Dye penetrant.

1.8.3 Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles together with instructions and guidance on their use are to be made available during the survey. A safety check-list is to be provided.

1.8.4 Adequate and safe lighting is to be provided for the safe and efficient conduct of the survey.

1.8.5 Adequate protective clothing is to be made available and used (e.g. safety helmet, gloves, safety shoes, etc) during the survey.

1.9 Surveys at sea or at anchorage

1.9.1 Surveys at sea or at anchorage may be accepted provided the Surveyor is given the necessary assistance from the personnel on board. Necessary precautions and procedures for carrying out the survey should be in accordance with *Subs 1.5, 1.6, 1.7* and *1.8*.

1.9.2 A communication system should be arranged between the survey party in the spaces and the responsible officer on deck. This system should also include the personnel in charge of ballast pump handling if boats or rafts are used.

1.9.3 Surveys of tanks or applicable holds by means of boats or rafts should only be undertaken with the agreement of the Surveyor, who should take into account the safety arrangements provided, including weather forecasting and ship response under foreseeable conditions and provided the expected rise of water within the tank does not exceed 0.25 m.

1.9.4 When rafts or boats will be used for close-up survey the following conditions should be observed:

(a) only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, should be used;
(b) the boat or raft should be tethered to the access ladder and an additional person should be stationed down the access ladder with a clear view of the boat or raft;
(c) appropriate lifejackets should be available for all participants;
(d) the surface of water in the tank or hold should be calm (under all foreseeable conditions the expected rise of water within the tank should not exceed 0.25 m) and the water level stationary. On no account should the level of the water be rising while the boat or raft is in use;
(e) the tank, hold or space must contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable; and
(f) at no time should the water level be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses should only be contemplated if a deck access manhole is fitted and open in the bay being examined, so that an escape route for the survey party is available at all times. Other effective means of escape to the deck may be considered.
(g) if the tanks (or spaces) are connected by a common venting system, or inert gas system, the tank in which the boat or raft should be used, should be isolated to prevent a transfer of gas from other tanks (or spaces).

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

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

(a) when the coating of the under-deck structure is in GOOD condition and there is no evidence of wastage; or
(b) if a permanent means of access is provided in each bay to allow safe entry and exit. This means:
    i. access direct from the deck via a vertical ladder and a small platform fitted approximately 2 m below the deck in each bay; or

ii. access to deck from a longitudinal permanent platform having ladders to deck in each end of the tank. The platform should, for the full length of the tank, be arranged in level with, or above, the maximum water level needed for rafting of under deck structure.For this purpose, the ullage corresponding to the maximum water level should be assumed not more than 3 m from the deck plate measured at the midspan of deck transverses and the middle length of the tank.

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

1.9.7 The use of rafts or boats alone in *1.9.5* and *1.9.6* does not preclude the use of boats or rafts to move about within a tank during a survey.

1.10 Survey planning meeting (applicable to Bulk Carriers and Oil Tankers)

1.10.1 The establishment of proper preparation and the close cooperation between the attending surveyor(s) and the owner's representatives on board prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings should be held regularly.

1.10.2 Prior to commencement of any part of the renewal and intermediate survey, a survey planning meeting should be held between the attending Surveyor(s), the owner's representative in attendance, the thickness measurement company operator (as applicable) and the master of the ship or an appropriately qualified representative appointed by the master or company for the purpose to ascertain that all the arrangements envisaged in the Survey Programme are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out.

1.10.3 The following is an indicative list of items that should be addressed in the meeting:

(a) schedule of the vessel (i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.);
(b) provisions and arrangements for thickness measurements (i.e. access, cleaning/descaling, illumination, ventilation, personal safety);
(c) extent of the thickness measurements;
(d) acceptance criteria (refer to the list of minimum thicknesses);
(e) extent of Close-up survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion;
(f) execution of thickness measurements;
(g) taking representative readings in general and where uneven corrosion/pitting is found;
(h) mapping of areas of substantial corrosion; and
(i) communication between attending Surveyor(s), the thickness measurement company operator(s) and owner representative(s) concerning findings.

1.11 Documents to be carried on board (applicable to Bulk Carriers and Oil Tankers)

1.11.1 The Owner is to supply and maintain on board documentation as specified under *para 1.11.2* and *1.11.4*, which should be readily available for the Surveyor. The documentation should be kept on board for the lifetime of the ship.

1.11.2 Survey Report file

A Survey Report file is to be a part of the documentation on board consisting of :

(a) Reports on structural surveys.
(b) Condition evaluation reports.
(c) Thickness measurements reports.

1.11.3 The Survey Report file is to be available also in the Owner's management office. The condition evaluation report referred to in *1.11.2*, should include a translation into English.

1.11.4 Supporting documents

The following additional documentation is to be available onboard:

(a) Survey programme as required by *Sub 1.5*, until such time as the Special Survey or Intermediate Survey, as applicable, has been completed.
(b) Main structural plan of cargo holds, cargo and ballast tanks (as applicable).
(c) Previous repair history.
(d) Cargo and ballast history.
(e) Extent of use of inert gas plant and tank cleansing procedures (for oil tankers).
(f) Inspections by ship's personnel with reference to:
  (i) Structural deterioration in general.
  (ii) Leakage in bulkheads and piping.
  (iii) Condition of coating or corrosion protection.
(e) Any other information that will assist in identifying critical structural areas and/or suspect areas requiring inspection.

1.11.5 Prior to survey, the Surveyor is to examine the completeness of the documentation onboard, and its contents as a basis for the survey.

1.12 Procedures for thickness measurements

1.12.1 The required thickness measurements, if not carried out by the recognized organization acting on behalf of the Society, should be witnessed by a Surveyor of the Society. The Surveyor should be on board to the extent necessary to control the process.

1.12.2 The thickness measurement company should be part of the survey planning meeting to be held prior to commencing the survey.

1.12.3 Thickness measurements of structures in areas where Close-up surveys are required should be carried out simultaneously with Close-up surveys.

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

1.12.5 The thickness measurements should be carried out by a qualified company certified by an organization recognized by the Society.

1.12.6 A thickness measurement report is to be prepared and submitted to the Society. The report is to give the location of measurements, the thickness measured as well as corresponding original thickness. Furthermore, the report is to give the date when the measurements were carried out, type of measurement equipment, names of personnel and their qualifications and has to be signed by the operator.

1.13 Evaluation of survey report

1.13.1 The data and information on the structural condition of the ship collected during the survey should be evaluated for acceptability and continued structural integrity of the ship.

1.13.2 In case of Oil Tankers of 130 m in length and upwards (as defined in the International Convention on Load Lines in force), the ship's longitudinal strength should be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the Special Survey carried out after the ship reached 10 years of age.

1.13.3 The analysis of data should be carried out and endorsed by the Society and the conclusions of the analysis should form a part of the condition evaluation report.

1.13.4 The final result of the evaluation of the ship's longitudinal strength required in *1.13.2*, after renewal or reinforcement work of structural members, if carried out as a result of initial evaluation, should be reported as a part of the condition evaluation report.

1.13.5 For single side skin bulk carriers of 150 m in length and above, which were contracted for construction prior to **1 July 1999**, carrying solid bulk cargoes having bulk density of **1.78 t/m^3** or above, fitted with vertically corrugated transverse bulkheads, a strength calculation of the internal structure of the double bottom in hold No. 1 and of the transverse bulkhead between holds No. 1 and 2 have to be carried out for the flooding condition.
In connection with this strength calculation additional thickness measurements have to be taken of the aforementioned structures. Required repairs and strengthening are to be approved by I.N.S.B.. Strength calculations are to be performed at all subsequent Class Special Surveys.

1.14 Reporting

1.14.1 When a survey is split between different survey stations, a report should be made for each portion of the survey. A list of items examined and/or tested (pressure testing, thickness measurements, etc.) and an indication of whether the item has been credited, should be made available to the next attending Surveyor(s), prior to continuing or completing the survey.

1.14.2 A condition evaluation report of the survey and results should be issued to the owner and placed on board the ship for reference at future surveys. The condition evaluation report should be endorsed by the Society.

SECTION 2
Hull Survey of General Cargo Ships carrying Solid Bulk Cargoes

The present Section apply to all self-propelled General Cargo ships of 500 GT and above, carrying Solid Bulk Cargoes other than:

• Bulk carriers, Double Skin or Single Skin, subject to ESP

• Deck cargo ships (a deck cargo ship is a ship that is designed to carry cargo exclusively above deck without any access for cargo below deck.)

• General dry cargo ships of double side-skin construction, with double side-skin extending for the entire length of the cargo area, and for the entire height of the cargo hold to the upper deck.

Likewise the present section does not apply to:

• Dedicated container carriers

• Dedicated forest product carriers (not timber or log carriers)

• Ro-ro cargo vessels

• Refrigerated cargo vessels

• Dedicated wood chip carriers

• Dedicated cement carriers

• Livestock carriers

2.1 Annual Survey

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

2.1.2 A general examination of the hull plating and its closing appliances so far as they can be seen, and a general examination of the watertight penetrations, are to be carried out, including:

(a) Side shell plating above the waterline.
(b) Cargo ports.
(c) Accessible parts of rudder.
(d) Weather decks.
(e) Bulwarks, including the provisions of freeing ports, special attention being given to any freeing ports fitted with shutters.
(f) Guardrails, gangways, walkways and other means provided for the protection of the crew and means for safe passage of crew.
(g) Ventilators and air pipes, including their coamings and closing appliances
(h) Weld connections between air pipes and deck plating.
(i) Flame screens on vents to all bunker tanks.
(j) Overflow and sounding pipes.
(k) Superstructures end bulkheads and the openings therein.
(l) Engine casing, skylights, miscellaneous hatches.
(m) Ladders on weather decks.

2.1.3 Anchoring and mooring equipment is to be surveyed, including the working test of windlass. For ships built after 01/01/2007, confirming that the towing and mooring equipment is properly marked with any restriction associated with its safe operation.

2.1.4 Examining each bilge pump and confirming that the bilge pumping system for each watertight compartment is satisfactory.

2.1.5 A confirmation is to be carried out, as far as practicable, that no significant changes have been made to the arrangement of structural fire protection.

2.1.6 Verification that loading guidance and stability data are on board ready for use.

2.1.7 Checking of the positions of the deck line and load line which, if necessary, are to be re-marked and re-painted.

2.1.8 Verification that no alterations have been made to the hull or superstructures which would affect the calculation determining the position of load lines.

2.1.9 The Annual Survey of **hatch covers and coamings** will include the following:

(a) Confirmation that no significant changes have been made to the hatch covers, hatch coamings and their securing and sealing devices.
(b) When fitted with **portable covers, wooden or steel pontoons**, checking of the satisfactory condition of:
  (i) Wooden covers and portable beams, carriers or sockets for portable beams and their securing devices.
  (ii) Steel pontoons.
  (iii) Tarpaulins.
  (iv) Cleats, battens and wedges.
  (v) Hatch securing bars and their securing devices.
  (vi) Loading pads/bars and the side plate edge.
  (vii) Guide plates and chocks.
  (viii) Compression bars, drainage channels and drain pipes (if any).
(c) When fitted with **mechanically operated steel covers**, checking of the satisfactory condition of:
  (i) Hatch covers; including close-up survey of hatch cover plating
  (ii) Tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels).
  (iii) Clamping devices, retaining bars, cleating.
  (iv) Chain or rope pulleys.
  (v) Guides, guide rails and track wheels.
  (vi) Stoppers.

(vii) Wires, chains, gypsies, tensioning devices.
(viii) Hydraulic system essential to closing and securing.
(ix) Safety locks and retaining devices.
(x) Random checking of the satisfactory operation of hatch covers, including :
- stowage and securing in open condition;
- proper fit, locking and efficiency of sealing in closed position;
- operational testing of hydraulic and power components, wires, chains and link drives.

(d) Checking of the satisfactory condition of hatch coaming plating and their stiffeners.

2.1.10 **Protection of other openings** is to be surveyed, including:
(a) Hatchways, manholes, and scuttles in freeboard and superstructure decks.
(b) Portlights together with deadcovers.
(c) Cargo ports, bow or stern access.
(d) Chutes and similar openings in ship's sides or ends below the freeboard deck or in way of enclosed superstructures.
(e) Ventilators, air pipes together with flame screens, scuppers, inlets and discharges serving spaces on or below the freeboard deck.
(f) All air pipe heads installed on the exposed decks
(g) The collision and watertight bulkheads, bulkhead penetrations and walls of enclosed superstructures.
(h) Weathertight and watertight doors and closing appliances for all the above including proper operation (locally and remotely) of such doors.

2.1.11 Suspect Areas

Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for the additional thickness measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

2.1.12 Examination of Cargo Holds

2.1.12.1 For **Ships 10 – 15 years of age**, the following is to apply:

a) Overall Survey of one forward and one after cargo hold and their associated tween deck spaces.

b) When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

2.1.12.2 For **Ships over 15 years of age**, the following is to apply:

a) Overall survey of all cargo holds and tween deck spaces.

b) Close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating in a forward lower cargo hold and one other selected lower 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 shell frames and adjacent shell plating of those cargo holds and associated tween deck spaces (as applicable) as well as a close-up survey of sufficient extent of all remaining cargo holds and tween deck spaces (as applicable).

c) When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

d) Where the protective coating in cargo holds, as applicable, is found to be in GOOD condition the extent of close-up surveys may be specially considered.

e) All piping and penetrations in cargo holds, including overboard piping, are to be examined.

2.1.12.3 Water ingress detection system and alarms of cargo holds, are to be examined and tested, when appropriate.

2.1.13 Examination of Ballast Tanks.

Examination of ballast tanks when required as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out. When considered necessary by the

surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements are to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

2.2 Intermediate Survey

2.2.1 General

2.2.1.1 The requirements for Annual Surveys are to be complied with and, additionally, the requirements of the present Section.

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

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

2.2.2 Survey Extent

2.2.2.1 The survey extent is dependent on the age of the vessel as specified in *2.2.2.2* through *2.2.2.4*.

2.2.2.2 **Ships 5 - 10 Years of Age**, the following is to apply:

Ballast tanks

(a) An overall survey of representative salt water ballast tanks selected by the Surveyor is to be carried out. When such examination reveals no visible structural defects, the examination may be limited to the verification that the protective coating remains efficient.

(b) Where POOR coating condition, corrosion or other defects are found in salt water ballast spaces or where a hard protective coating was not applied from the time of construction, the examination is to be extended to other ballast tanks of the same type.

(c) In water ballast tanks other than double bottom tanks, where a hard protective coating is found in POOR condition, and is not renewed, where soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction, maintenance of class is to be subject to the tanks in question being internally examined and thickness measurement carried out as deemed necessary at annual intervals.

(d) In water ballast double bottom tanks, where such breakdown of hard protective coating is found, where a soft or semi-hard coating has been applied or where a coating has not been applied from the time of construction, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.

(e) When considered necessary by the Surveyor or, where extensive corrosion is found, thickness measurements are to be required.

(f) In addition to the requirements above, areas found suspect at previous surveys are to be surveyed in accordance with the provisions indicated in *para 2.1.11*

Cargo Holds

(a) An Overall Survey of one forward and one after cargo hold and their associated tween deck spaces.

(b) Areas found suspect at previous surveys are to be surveyed in accordance with the provisions indicated in *para 2.1.11*.

2.2.2.3 **Ships 10 – 15 Years of Age**, the following is to apply:

Ballast Tanks

(a) An overall survey of all water ballast tanks is to be carried out. Where such examination reveals no visible structural defects, the examination may be limited to verification that the protective coating remains efficient.

(b) The requirements of *para 2.2.2.2* (c) to (f) also apply.

Cargo Holds

(a) An Overall Survey of all cargo holds and tween deck spaces.

(b) Areas found suspect at previous surveys are to be surveyed in accordance with the provisions indicated in *para 2.1.11*.

(c) When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

2.2.2.4 **Ships over 15 Years of Age**, the following is to apply:

The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey as required in ***Sub 2.3***, except for the item **2(c) in column 4 of *Table II***. However, tank testing specified in *Paragraph 2.3.7*, and internal examination of fuel oil, lube oil and fresh water are not required unless deemed necessary by the attending surveyor.

2.3 Special Survey

2.3.1 General

2.3.1.1 Special surveys are to be carried out at 5 years intervals to renew the Classification Certificate, as indicated in *Sec 5* of *Ch 2*.

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

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

2.3.2 General Examinations

2.3.2.1 The Special Survey is to include, in addition to the requirements of the Annual Surveys, examination, tests and checks of sufficient extent to ensure that the hull, hatch covers, coamings and related piping, are in a satisfactory condition and fit for the intended purpose for the new period of class of five years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

2.3.2.2 The examinations of the hull are to be supplemented by thickness measurements and testing, to ensure that the structural integrity remains effective. The aim of the examination is to discover Substantial Corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

2.3.2.3 The Special Survey is to include examination of underwater parts as per *Ch 3 Sec 8*.

2.3.2.4 Anchors and chain cables are to ranged, examined and the required complement and condition verified. Lengths of chain cables worn out more than **12%** from their nominal diameter are to be renewed. Windlasses are to be examined and checked. The chain locker, holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker tested.

2.3.2.5 All spaces including holds and their tween decks where fitted; double bottom, deep, ballast and peak tanks; pipe tunnels, duct keels, machinery spaces, dry spaces, cofferdams and voids are to be internally examined including the plating and framing, bilges and drain wells, sounding, venting, pumping and drainage arrangements. Internal examination of fuel oil, lube oil and fresh water tanks is to be carrid out in accordance with *Table IV*.

2.3.2.6 The engine room structure is to be examined. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops and engine room bulkheads in way of tank top and bilge wells. Particular attention is to be given to sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspected, thickness measurements are to be carried out.

2.3.2.7 The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks.

2.3.2.8 All bilge and ballast piping systems are to be examined and operationally tested to working pressure to attending Surveyor’s satisfaction to ensure that tightness and condition remain satisfactory.

2.3.2.9 Water ingress detection system and alarms of cargo holds, are to be examined and tested, when appropriate.

2.3.3 Tank Protection

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

When such breakdown of hard protective coating is found in water ballast double bottom tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out.

2.3.3.2 Where the hard protective coating in spaces is found to be in a GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.

2.3.4 Hatch Covers and coaming

The hatch covers and coamings are to be surveyed as follows:

2.3.4.1 A thorough inspection of the items listed in *para 2.1.9*, for Annual Survey is to be carried out.

2.3.4.2 Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:

- stowage and securing in open condition;
- proper fit and efficiency of sealing in closed conditions;
- operational testing of hydraulic and power components, wires, chains and link drives.

2.3.4.3 Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent is to be carried out.

2.3.4.4 Thickness measurement of the hatch cover and coaming plating and stiffeners is to be carried out as given in *Table II*.

2.3.5 Extent of Overall and Close-up Survey

2.3.5.1 An overall survey of all tanks and spaces, excluding fuel oil, lube oil and fresh water tanks, is to be carried out at each Special Survey.

Note: For fuel oil, lube oil and fresh water tanks, reference is made to *Table III*.

2.3.5.2 The minimum requirements for close-up surveys at Special Survey are given in *Table I*.

2.3.5.3 The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or details which have suffered defects in similar spaces or on similar ships according to available information.

2.3.5.4 For areas in spaces where hard protective coatings are found to be in a GOOD condition, the extent of close-up surveys according to *Table I* may be specially considered.

2.3.6 Extent of Thickness Measurement

2.3.6.1 The minimum requirements for thickness measurements at Special Survey are given in *Table II*.

2.3.6.2 Representative thickness measurement to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds and water ballast tanks is to be carried out. Thickness measurement is also to be carried out to determine the corrosion levels on the transverse bulkhead plating. The thickness measurements may be dispensed with, provided the surveyor is satisfied by the close-up examination, that there is no structural diminution, and the hard protective coating where applied remains efficient.

2.3.6.3 The Surveyor may extend the thickness measurement as deemed necessary. When thickness measurements indicate substantial corrosion, the extent of thickness measurement is to be increased to determine the extent of areas of substantial corrosion. *Table IV* to be used as guidance for these additional thickness measurements.

2.3.6.4 For areas in tanks where hard protective coatings are found to be in a GOOD condition, the extent of thickness measurement according to *Table II* to be specially considered.

2.3.6.5 Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

2.3.7 Extent of Tank Testing

2.3.7.1 All boundaries of water ballast tanks and deep tanks used for water ballast within the cargo length area are to be pressure tested with the head of the liquid to the top of air pipes. For fuel oil tanks, the representative tanks are to be pressure tested.

2.3.7.2 The Surveyor may extend the tanks testing as deemed necessary.

2.3.7.3 Tank testing of fuel oil tanks is to be carried out with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

2.3.8 Automatic Air Pipe Heads

2.3.8.1 Automatic air pipe heads are to be completely examined (both externally and internally) as indicated in *Table V*.

2.3.9 Dry Dock Survey

2.3.9.1 The Special Survey is to be held, as a rule, when the ship is in dry-docking or on a slipway, unless a Docking Survey has been carried out within the admissible period (see

Ch 2 Sub 5.4). The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and water ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note: Lower portions of the cargo holds and ballast tanks are considered to be parts below light ballast water line.

TABLE I Close-up Survey - General Cargo Ships carrying Solid Bulk Cargoes

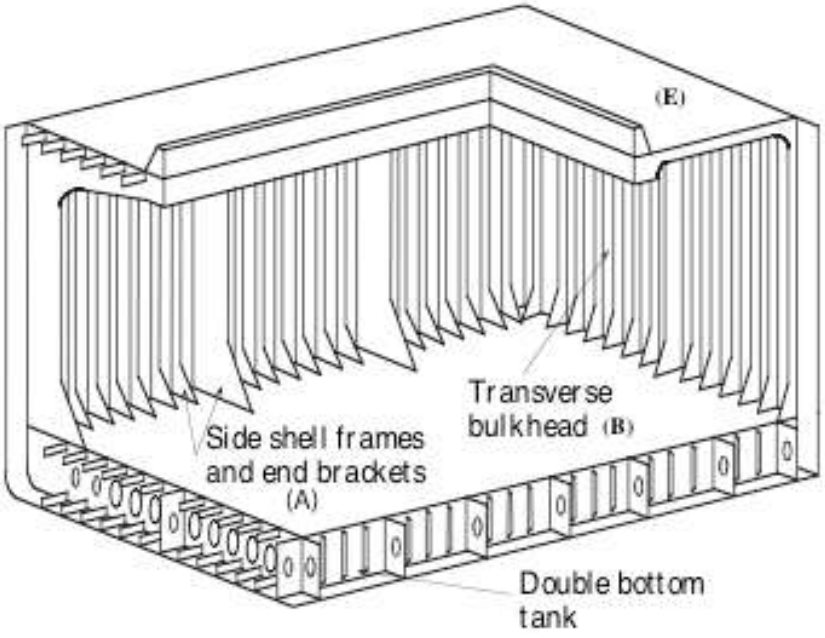
Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15	Special Survey IV and Subsequent Age > 15
(A) Selected shell frames in one forward and one aft cargo hold and associated tween deck spaces **(B)** One Selected cargo hold transverse bulkhead **(C)** All cargo hold hatch covers and coamings (plating and stiffeners)	**(A)** Selected shell frames in all cargo holds and tween deck spaces **(B)** One transverse bulkhead in each cargo hold **(B)** Forward and aft transverse bulkhead in one side ballast tank, including stiffening system **(C)** One transverse web with associated plating and framing in two representative water ballast tanks of each type (i.e. topside, hopper side, side tank or double bottom tank) **(D)** All cargo hold hatch covers and comings (plating and stiffeners) **(E)** Selected areas of all deck plating and underdeck structure inside line of hatch openings between cargo hold hatches **(F)** Selected areas of inner bottom plating	**(A)** All shell frames in the forward lower cargo hold and 25% frames in each of the remaining cargo holds and tween deck spaces including upper and lower end attachments and adjacent shell plating **(B)** All cargo hold transverse bulkheads **(B)** All transverse bulkheads in ballast tanks, including stiffening system **(C)** All transverse webs with associated plating and framing in each water ballast tank **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and underdeck structure inside line of hatch openings between cargo hold hatches **(F)** All areas of inner bottom plating	**(A)** All shell frames in all cargo holds and tween deck spaces including upper and lower end attachments and adjacent shell plating Areas **(B – F)** as for Special Survey No.III

(A) Cargo hold transverse frames.
(B) Cargo hold transverse bulkhead plating, stiffeners and girders.
(C) Transverse web frame or watertight transverse bulkhead in water ballast tanks.
(D) Cargo hold hatch covers and coamings.
(E) Deck plating and underdeck structure inside line of hatch openings between cargo hold hatches.
(F) Inner bottom plating.

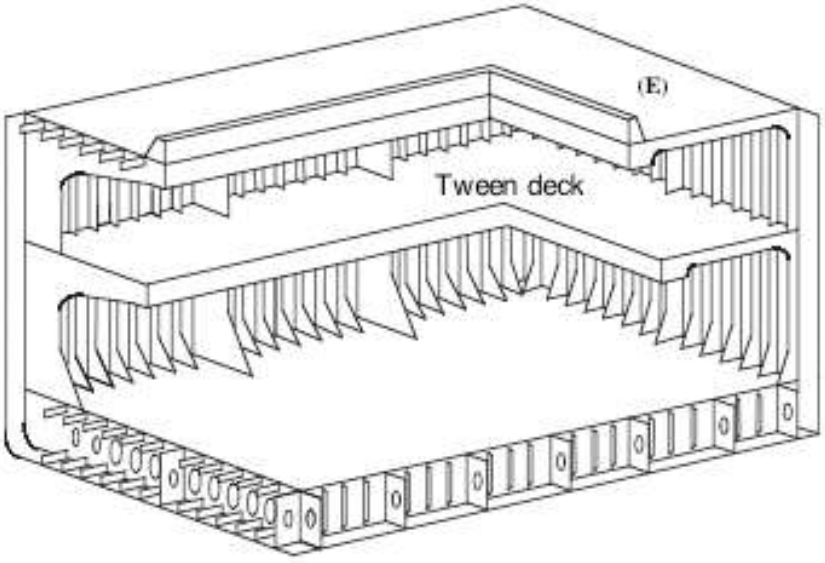
See Figs 1 and 2 for the areas corresponding to (A), (B), (C), (D), (E) and (F) .

Note: Close-up survey of cargo hold transverse bulkheads to be carried out at the following levels:

I. Immediately above the inner bottom and immediately above the tween decks, as applicable.
II. Mid-height of the bulkheads for holds without tween decks.
III. Immediately below the main deck plating and tween deck plating.



(a) Single Deck Ship



(b) Tween Deck Ship

Figure 1 Areas for Close-up Survey of General Cargo Ships carrying Solid Bulk Cargoes

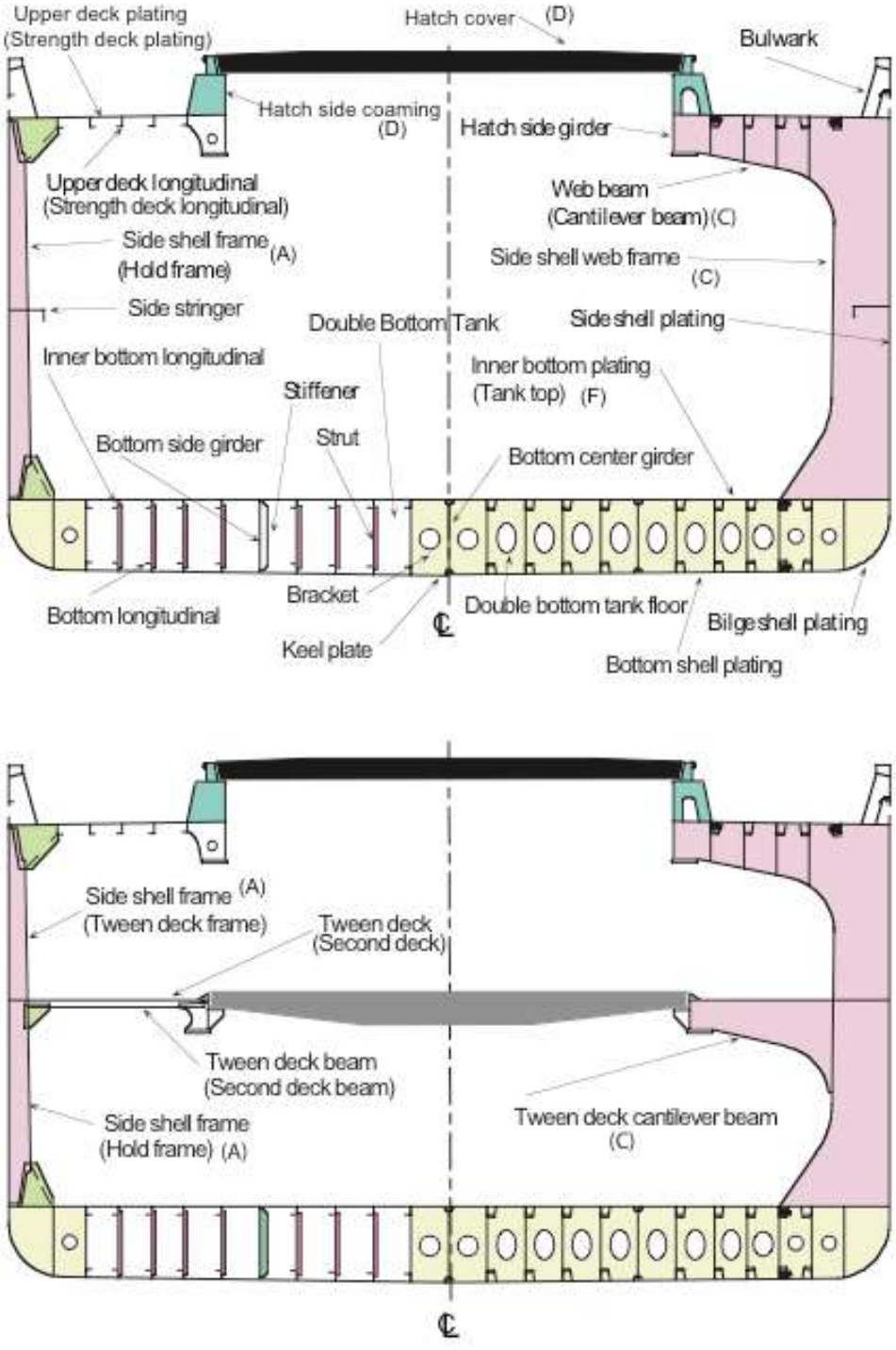


Figure 2 for Close-up Survey of General Cargo Ships carrying Solid Bulk Cargoes

TABLE II Thickness measurements during Special Surveys - General Cargo Ships carrying Solid Bulk Cargoes

Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
1. Suspect areas	1. Suspect areas 2. One transverse section of deck plating in way of a cargo space within the amidships 0.5L 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to *Table I*	1. Suspect areas 2. Two transverse sections within the amidships 0.5L in way of two different cargo spaces 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to *Table I* 4. Within the cargo length area, each deck plate outside line of cargo hatch openings 5. All wind and water strakes within the cargo length area 6. Selected wind and water strakes outside the cargo length area	1. Suspect areas 2. Within the cargo length area: a) A minimum of three transverse sections within the amidships 0.5L b) Each deck plate outside line of cargo hatch openings c) Each bottom plate, including lower turn of bilge d) Duct keel or pipe tunnel plating and internals 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to Close-up survey according to *Table I* 4. All wind and water strakes full length

Notes:
1. Thickness measurement locations should be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.
2. For ships less than 100 metres in length, the number of transverse sections required at Special Survey III may be reduced to one and the number of transverse sections at Special Survey IV and subsequent surveys may be reduced to two.

TABLE III Fuel oil, lube oil and fresh water tanks internal examination - General Cargo Ships carrying Solid Bulk Cargoes

Tank	Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15	Special Survey IV and Subsequent Age > 15
Fuel Oil Bunkertanks				
Engine Room	None	None	One	One
Cargo Length Area	None	One	Two	Half, minimum 2
Lube Oil	None	None	None	One
Fresh Water	None	One	All	All

Notes:

1) These requirements apply to tanks of integral (structural) type.
2) If a selection of tanks is accepted to be examined, then different tanks are to be examined at each special survey, on a rotational basis.
3) Peak tanks (all uses) are subject to internal examination at each special survey.
4) At special surveys III and subsequent surveys, one deep tank for fuel oil in the cargo length area is to be included, if fitted.

TABLE IV Guidance for additional thickness measurements in way of substantial corrosion

Structural member	Extent of measurement	Pattern of measurement
Plating	Suspect area and adjacent plates	Five-point pattern over 1 square metre
Stiffeners	Suspect area	Three measurements in line across each flange and web

TABLE V Survey requirements for automatic air pipe heads during Special Surveys - General Cargo Ships carrying Solid Bulk Cargoes

Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III and Subsequent, Age > 10
1. Two air pipe heads, one port and one starboard, located on the exposed decks in the forward 0.25 L, preferably air pipes serving ballast tanks 2. Two air pipe heads, one port and one starboard, on exposed decks, serving spaced aft of 0.25 L, preferably air pipes serving ballast tanks (1) (2)	1. All air pipe heads located on the exposed decks in the forward 0.25L 2.At least 20% of air pipe heads on the exposd decks serving spaces aft of 0.25 L, preferably air pipes serving ballast tanks (1) (2)	1. All air pipe heads located on the exposed decks

Notes :

(1) The selection of air pipe heads to be examined is left to the attending Surveyor.

(2) According to the results of this examination, the Surveyor may require the examination of other heads located on the exposed decks.

SECTION 3
Hull Surveys of Bulk Carriers

Unless expressly provided otherwise, the present Section, apply to all self-propelled Bulk Carriers and Double-Side Skin Bulk Carriers, of 500 GT and above.

3.1 Annual Survey

3.1.1 Schedule

3.1.1.1 Annual Surveys are to be held within 3 months before or after anniversary date from the date of the Initial Class Survey or of the date credited for the last Special Survey.

3.1.2 General

3.1.2.1 The Annual Survey should consist of an examination for the purpose of ensuring, as far as practicable, that the hull, weather decks, hatch covers, coamings and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file.

3.1.3 Examination of the hull

3.1.3.1 Examination of the hull plating and its closing appliances as far as can be seen.

3.1.3.2 Examination of watertight penetrations as far as practicable.

3.1.4 Hatch covers and coamings

3.1.4.1 Checking that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since that last survey.

3.1.4.2 A thorough survey of cargo hatch covers and coamings is only possible by examination in the open as well as closed positions and should include verification of proper opening and closing operation. As a result, the hatch cover sets within the forward 25% of the ship's length and at least one additional set, such that all sets on the ship are assessed at least once in every 5-year period, should be surveyed open, closed and in operation to the full extent in each direction at each Annual Survey, including:

- stowage and securing in open condition;
- proper fit and efficiency of sealing in closed condition; and
- operational testing of hydraulic and power components, wires, chains and link drives.

The closing of the covers should include the fastening of all peripheral, and cross joint cleats or other securing devices. Particular attention should be paid to the condition of hatch covers in the forward 25% of the ship's length, where sea loads are normally greatest.

3.1.4.3 If there are indications of difficulty in operating and securing hatch covers, additional sets above those required by *3.1.4.2* at the discretion of the surveyor, should be tested in operation.

3.1.4.4 Where the cargo hatch securing system does not function properly, repairs should be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with the provisions of Annex 13 of IMO Resolution A.1049(90).

3.1.4.5 For each cargo hatch cover set, at each annual survey, the following items should be surveyed:

(a) cover panels, including side plates, and stiffener attachments that may be accessible in the open position by close-up survey (for corrosion, cracks, deformation);
(b) sealing arrangements of perimeter and cross joints (gaskets for condition and permanent deformation, flexible seals on combination carriers, gasket lips, compression bars, drainage channels and non return valves);
(c) clamping devices, retaining bars, cleating (for wastage, adjustment, and condition of rubber components);
(d) closed cover locating devices (for distortion and attachment);
(e) chain or rope pulleys;
(f) guides;
(g) guide rails and track wheels;
(h) stoppers;
(i) wires, chains, tensioners and gypsies;
(j) hydraulic system, electrical safety devices and interlocks; and
(k) end and interpanel hinges, pins and stools where fitted.

3.1.4.6 At each hatchway, at each annual survey, the coamings, with plating, stiffeners and brackets should be checked for corrosion, cracks and deformation, especially of the coaming tops including close-up survey.

3.1.4.7 Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components.

3.1.4.8 Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition of:
(a) Wooden covers and portable beams, carriers or sockets for the portable beam and their securing devices.
(b) Steel pontoons, including a close-up Survey of hatch cover plating.
(c) Tarpaulins.
(d) Cleats, battens and wedges.
(e) Hatch securing bars and their securing devices.
(f) Loading pads/bars and the side plate edge.
(g) Guide plates and chocks.
(h) Compression bars, drainage channels and drain pipes (if any).

3.1.4.9 The flame screens on vents to all bunker tanks should be examined.

3.1.4.10 Bunker and vent piping systems, including ventilators should be examined.

3.1.5 Cargo holds

3.1.5.1 For ships **up to 10 years** of age, an overall survey of a representative forward and aft cargo hold is to be carried out. Where this level of survey reveals the need for remedial measures, the survey is to be extended to all cargo holds (overall survey, general condition).

3.1.5.2 For **Bulk Carriers over 10 to 15 years** of age the following will be required:
(a) Overall survey of all cargo holds.
(b) Close-up examination of a sufficient extent (minimum **25%**) of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating in the forward 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 shell frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent of all remaining cargo holds.
(c) When deemed necessary by the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased according to *Table VII*. These extended thickness measurements should be carried out before the annual survey is credited as completed. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.
(d) Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.
(e) All piping and penetrations in cargo holds, including overboard piping, should be examined.

3.1.5.3 For **Double-Side Skin Bulk Carriers over 10 to 15 years** of age the following will be required:
(a) Overall survey of two selected cargo holds.
(b) When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement should be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with *Table VIII*. These extended thickness measurements should be carried out before the survey is credited as complete. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.
(c) All piping and penetrations in cargo holds, including overboard piping, should be examined.

3.1.5.4 For **Bulk Carriers over 15 years** of age the following will be required:
(a) Overall survey of all cargo holds.
(b) Close-up examination of sufficient extent (minimum **25%** of frames) to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating in the forward cargo hold and one 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 the shell frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent of all remaining cargo holds.
(c) When deemed necessary by the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased according to *Table VII*. These extended thickness measurements should be carried out before the annual survey is credited as completed. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.
(d) Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.
(e) All piping and penetrations in cargo holds, including overboard piping, should be examined.

3.1.5.5 For **Double-Side Skin Bulk Carriers over 15 years** of age the following will be required:

(a) Overall survey of all cargo holds.

(b) When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurement should be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with *Table VIII*. These extended thickness measurements should be carried out before the survey is credited as complete. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.

(c) All piping and penetrations in cargo holds, including overboard piping, should be examined.

3.1.6 Ballast tanks

3.1.6.1 Sea water ballast tanks are to be surveyed, within Annual Surveys, as a consequence of the results of the Special and Intermediate Surveys.

3.1.6.2 When deemed necessary by the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased according to *Table VII or Table VIII*, for Bulk Carriers and Double-Side Skin Bulk Carriers respectively. These extended thickness measurements should be carried out before the annual survey is credited as completed. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.

3.1.7 Additional Annual Survey requirements for the foremost cargo hold of ships subject to Regulation XII/9 of the Convention.

3.1.7.1 Ships subject to regulation XII/9 of the Convention are those meeting all of the following conditions:

i. Bulk Carriers of 150 m in length and upwards of single-side skin construction;

ii. carrying solid bulk cargoes having density of 1.78 t/m^3 and above;

iii. constructed before 1 July 1999; and

iv. constructed with an insufficient number of transverse watertight bulkheads to enable them to withstand flooding of the foremost cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium as specified in regulation XII/4.4 of the Convention.

3.1.7.2 In the case of Bulk Carriers over five years of age, the Annual Survey should include, in addition to the requirements of the annual surveys prescribed in this Section, an examination of the following items.

3.1.7.3 Extent of survey

3.1.7.3.1 ***For Bulk Carriers of 5 to 15 years of age***

An overall survey of the foremost cargo hold, including close-up survey of sufficient extent, minimum 25 per cent of frames, should be carried out to establish the condition of:

(a) shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads; and

(b) areas found to be suspect areas at the previous Special Survey.

3.1.7.3.1 Where considered necessary by the Surveyor as a result of the overall and close-up survey as described in *3.1.7.3.1* above, the survey should be extended to include a close-up survey of all of the shell frames and adjacent shell plating of the cargo hold.

3.1.7.3.3 ***For Bulk Carriers exceeding 15 years of age***

An overall survey of the foremost cargo hold, including close-up survey should be carried out to establish the condition of:

(a) all shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads; and

(b) areas found to be suspect areas at the previous Special Survey.

3.1.7.4 Extent of thickness measurement

3.1.7.4.1 Thickness measurement should be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey, as described above. The minimum requirement for thickness measurements are areas found to be suspect areas at the previous Special Survey. Where substantial corrosion is found, the extent of thickness measurements should be increased with the requirements of *Table VII*.

3.1.7.4.2 The thickness measurement may be dispensed with provided the Surveyor is satisfied by the close-up survey, there is no structural diminution and the protective coating, where applied, remains effective.

3.1.7.4.3 Special consideration

Where the protective coating, as referred to in the explanatory note below, in the foremost cargo hold is found to be in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.

Explanatory note:For existing Bulk Carriers, where owners may elect to coat or recoat cargo holds as noted above,

consideration may be given to the extent of the close-up and thickness measurement surveys. Prior to the coating of cargo holds of existing ships, scantlings should be ascertained in the presence of a surveyor.

3.1.8 Additional Annual Survey requirements after determining compliance with regulations XII/12 and XII/13 of the Convention

3.1.8.1 For ships complying with the requirements of regulation XII/12 of the Convention for hold, ballast and dry cargo space water level detectors, the Annual Survey should include an examination and a test, at random, of the water ingress detection systems and of their alarms.

3.1.8.2 For ships complying with the requirements of regulation XII/13 of the Convention for the availability of pumping systems, the Annual Survey should include an examination and a test, of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

3.2 Intermediate Survey - General

3.2.1 General

3.2.1.1 The Intermediate Survey is to be held at or between the 2nd or 3rd Annual Survey.

3.2.1.2 Requirements for Intermediate Surveys, which are additional to the requirements for Annual Surveys, may be surveyed either at or between the 2nd and 3rd Annual Surveys.

3.2.2 Intermediate Survey of ships 5-10 years of age

3.2.2.1 Ballast tanks

3.2.2.1.1 For tanks used for water ballast, an overall survey of representative spaces selected by the Surveyor is to be carried out. The selection should include fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks. If such inspections reveal no visible structural defects, the examination may be limited to verification that the protective coating remains efficient.

3.2.2.1.2 Where POOR coating condition, corrosion or other defects are found in water ballast tanks or where protective coating was not applied from the time of construction, the examination is to be extended to other ballast tanks of the same type.

3.2.2.1.3 In water ballast tanks other than double bottom tanks, where a hard protective coating is found in POOR condition, and it is not renewed, where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, maintenance of class is to be subject to the tanks in question being examined and thickness measurements carried out as considered necessary at annual intervals.

3.2.2.1.4 When breakdown of coating is found in water ballast double bottom tanks, where a soft or semi-hard coating has been applied, or where a hard protecting coating has not been applied, maintenance of class may be subject to the tanks in question being examined at annual intervals. When deemed necessary by the Surveyor, or where extensive corrosion exists, thickness measurements should be carried out.

3.2.2.1.5 In addition to the requirements above, suspect areas identified at the previous Special Survey are to be overall and close-up surveyed.

3.2.2.2 Cargo holds

3.2.2.2.1 An overall survey of all cargo holds, including close-up survey of sufficient extent (minimum 25 % of frames) is to be carried out to determine the condition of:

(a) Shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads in the forward cargo hold and one other selected cargo hold.
(b) Areas found suspect at the previous Surveys.

3.2.2.2.2 Where deemed necessary by the Surveyor as a result of the overall and close-up surveys of a cargo hold as described above, the survey is to be extended to include a close-up survey of all of the shell frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent of all remaining cargo holds.

3.2.2.3 Thickness measurements for ships 5-10 years of age

3.2.2.3.1 Thickness measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up Survey as described in *para 3.2.2.2.1.*

3.2.2.3.2 The minimum requirement for thickness measurements at the Intermediate Survey are areas found to be suspect areas at the previous Surveys.

3.2.2.3.3 The extent of thickness measurement may be specially considered provided the Surveyor is satisfied by the close-up survey, that there is no structural diminution and the hard protective coatings are found to be in a GOOD condition.

3.2.2.3.4 Where substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with *Table VII or Table VIII*, for Bulk Carriers and Double-Side Skin Bulk Carriers respectively. These extended thickness measurements should be carried out before the survey is credited as completed. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.

3.2.3 Intermediate Survey of Ships 10 - 15 years of age

3.2.3.1 The requirements of the Intermediate Survey should be the same extent as the previous Special Survey as required in *Sub 3.3*. However, internal examination of fuel tanks and pressure testing of all tanks are not required unless deemed necessary by the attending Surveyor.

3.2.3.2 In application of *3.2.3.1*, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey.

3.2.3.3 In application of *3.2.3.1*, an underwater survey may be considered in lieu of the requirements of Dry-Dock Survey.

3.2.4 Intermediate Survey of Ships over 15 years of age

3.2.4.1 The requirements of the Intermediate Survey should be to the same extent as the previous Special Survey. However, pressure testing of tanks and cargo holds used for ballast is not required unless deemed necessary by the attending Surveyor.

3.2.4.2 In application of *3.2.4.1* the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey.

3.2.4.3 In application of *3.2.4.1*, a survey in Dry-Dock should be part of the intermediate survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and water ballast tanks should be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already performed.

Note: Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.

3.3 Special Survey

3.3.1 Schedule

3.3.1.1 Special Surveys are to be carried out at 5-yearly intervals to renew the Certificate of Class.

3.3.1.2 The first Special Survey is to be completed within 5 years from the date of the Initial Class Survey and thereafter within 5 years from the credited date of the previous Special Survey. However, an extension of class of 3 months maximum beyond the 5th year can be granted under exceptional circumstances. In this case, the next class period will start from the expiry date of the Special Survey before the extension was granted.

3.3.1.3 For surveys completed within 3 months before the expiry date of the Special Survey, the next class period will start from the expiry date of the Special Survey. For surveys completed more than 3 months before the expiry date of the Special Survey, the class period will start from the survey completion date.

3.3.1.4 The Special Survey may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date.

3.3.1.5 As part of the preparation for the Special Survey, the Survey Programme is to be dealt with in advance of the Special Survey. Thickness measurements are not to be held before the 4th Annual Survey.

3.3.1.6 The Special Survey is to include, in addition to the requirements for Annual Surveys, examination, tests, and checks of sufficient extent to ensure that the hull and related piping are in a satisfactory condition and that the ship is fit for its intended purpose for the new class period of 5 years to be assigned subject to proper maintenance and operation and to Periodical Surveys being carried out at the due dates.

3.3.1.7 All cargo holds, salt water ballast tanks including double bottom tanks and double-side tanks, where fitted, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurements and testing as required by *3.3.6* and *3.3.7*, to ensure that the structural integrity remains effective. The examination is to be sufficient to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

3.3.1.8 All piping systems within the above spaces are to be examined and tested under working conditions to ensure that the tightness and condition remains satisfactory.

3.3.1.9 The extent of survey of ballast tanks converted to void spaces should be specially considered in relation to the requirements for ballast tanks.

3.3.1.10 Concurrent crediting to both intermediate survey and renewal survey for surveys and thickness measurements of spaces should not be acceptable.

3.3.2 Dry - Dock Survey

3.3.2.1 A survey in dry-dock should be a part of the Special Survey. There should be a minimum of two inspections of the outside of the ship's bottom during the five-year period of the certificate. In all cases, the maximum interval between bottom inspections should not exceed 36 months.

3.3.2.2 For ships of 15 years of age and over, inspection of the outside of the ship's bottom should be carried out with the ship in dry-dock. For ships of less than 15 years of age, alternate inspections of the ship's bottom not conducted in conjunction with the Special Survey may be carried out with the ship afloat. Inspection of the ship afloat should only be carried out when the conditions are satisfactory and the proper equipment and suitably qualified staff is available.

3.3.2.3 If a survey in dry-dock is not completed in conjunction with the renewal survey or if the 36 month maximum interval referred to in *3.3.2.1* is not complied with, the Class Certificate should cease to be valid until a survey in dry-dock is completed.

3.3.2.4 The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks should be carried out in accordance with the applicable requirements for renewal surveys, if not already performed.

Note **:** Lower portions of the cargo holds and ballast tanks are considered to be the parts below ligt ballast water line.

3.3.3 Tank protection

3.3.3.1 Where provided, the condition of corrosion prevention system of ballast tanks is to be examined.

3.3.3.2 For tanks used for water ballast, excluding double bottom tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a protective coating was not applied from the time of construction, maintenance of class will be subject to the tanks in question being examined at annual intervals. Thickness measurements should be carried out as deemed necessary by the Surveyor.

3.3.3.3 When breakdown of hard protective coating is found in water ballast double bottom tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a protective coating was not applied from the time of construction, maintenance of class may be subject to the tanks in question being examined at annual intervals. When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out.

3.3.3.4 Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of Close-up Surveys and thickness measurements may be specially considered.

3.3.4 Hatch covers and coamings

3.3.4.1 The hatch covers and coamings are to be surveyed as follows:

(a) A thorough inspection of the items listed in *3.1.4* is to be carried out in addition to all hatch covers and coamings.
(b) Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including:
  (i) Stowage and securing in open condition.
  (ii) Proper fit and efficiency of sealing in closed condition.
  (iii) Operational testing of hydraulic and power components, wires, chains, and link drives.
(c) Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent.
(d) Thickness measurements of the hatch cover and coaming plating and stiffeners are to be carried out in accordance with *Table V or Table VI,* for Bulk Carriers and Double-Side Skin Bulk Carriers respectively.

3.3.5 Overall and Close-up survey

3.3.5.1 An overall survey of all tanks and spaces, excluding fuel oil tanks, is to be carried out at each Special Survey.

3.3.5.2 For fuel oil tanks the necessity for the overall survey is to be determined on the basis of the ship's age in accordance with *Table IV*.

3.3.5.3 The minimum requirements for close-up surveys at Special Survey are given in *Table I , Table II, or Table III* for Bulk Carriers, Double-Side Skin Bulk Carriers and Ore Carriers, respectively.

3.3.5.4 The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or

details which have suffered defects in similar spaces or on similar ships according to the available information.

3.3.5.5 For areas in spaces where hard protective coatings are found to be in a GOOD condition, the extent of close-up surveys according to *Tables I, II*, or *III*, may be specially considered.

3.3.6 Thickness measurements at Special Survey

3.3.6.1 The minimum requirements for thickness measurements at Special Survey are given in *Table V or Table VI*, for Bulk Carriers and Double-Side Skin Bulk Carriers respectively, depending on vessel's age.

3.3.6.2 Representative thickness measurements to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds and salt water ballast tanks is to be carried out. Thickness measurements are also to be carried out to determine the corrosion levels on the transverse bulkhead plating. The extent of thickness measurements may be specially considered provided the surveyor is satisfied by the close-up examination, that there is no structural diminution, and the hard protective coating where applied remains efficient.

3.3.6.3 The Surveyor may extend the thickness measurements as deemed necessary. This applies especially to areas with substantial corrosion and to areas defined as suspect in the survey programme.

3.3.6.4 When substantial corrosion is found the extent of thickness measurements is to be increased in accordance with *Table VII or Table VIII*, for Bulk Carriers and Double-Side Skin Bulk Carriers respectively. These extended thickness measurements should be carried out before the survey is credited as completed. Suspect areas identified at previous surveys should be examined. Areas of substantial corrosion identified at previous surveys should have thickness measurements taken.

3.3.6.5 For areas in spaces where coatings are found to be in a GOOD condition the extent of thickness measurements according to *Tables V or VI* may be specially considered by I.N.S.B..

3.3.6.6 Transverse sections should be chosen where largest reductions are suspected to occur or are revealed from deck plating measurements.

3.3.6.7 Additional thickness are to be carried out, to the side shell and brackets on Single Skin Bulk Carriers subject to compliance with resolution MSC.168(79), as per Annex 15 of IMO Resolution A.1049(27).

3.3.6.8 Additional thickness measurements are to be carried out, to the vertically corrugated transverse bulkhead between cargo holds No.1 and No.2, for Single Skin Bulk Carriers of 150 m in length and above, carrying solid bulk cargoes having density of 1.78 t/m^3 and above, as per Annex 11 of IMO Resolution A.1049(27).

3.3.7 Tank pressure testing at Special Survey

3.3.7.1 All boundaries of water ballast tanks, deep tanks and cargo holds used for salt water ballast within the cargo area length are to pressure tested.

3.3.7.2 For fuel oil tanks, only the representative tanks as selected by the surveyor are to be pressure tested.

3.3.7.3 The Surveyor may extend the tank testing as deemed necessary.

3.3.7.4 Boundaries of ballast tanks should be tested with a head of liquid to the top of air pipes.

3.3.7.5 Boundaries of ballast holds should be tested with a head of liquid to near the top of hatches.

3.3.7.6 Boundaries of fuel oil tanks should be tested with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be specially considered based on a satisfactory external examination of the tank boundaries and a confirmation from the master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

3.3.7.7 The testing of double-bottom tanks and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tanktop is carried out.

3.3.8 Additional Special Survey requirements after determining compliance with regulations XII/12 and XII/13 of the Convention

3.3.8.1 For ships complying with the requirements of regulation XII/12 of the Convention for hold, ballast and dry space water level detectors, the Special Survey should include an examination and a test of the water ingress detection system and of their alarms.

3.3.8.2 For ships complying with the requirements of regulation XII/13 of the Convention for the availability of pumping systems, the Special Survey should include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

TABLE I Close-up Survey - Bulk Carriers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
(A) 25% of shell frames and their end attachments in the forward cargo hold at representative positions **(A)** Selected frames in the remaining cargo holds **(B)** One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type (i.e. topside, hopper side and side tank) **(C)** Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted **(D)** All cargo hold hatch covers and coamings (plating and stiffeners)	**(A)** All shell frames in the forward cargo hold and 25% of shell frames in each of the remaining cargo holds including upper and lower end attachments and adjacent shell **(A)** For bulk carriers of 100,000 dwt and above, all shell frames in the forward cargo hold and 50% of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating **(B)** One transverse web with associated plating and longitudinals in each water ballast tank **(B)** Forward and aft transverse bulkheads in one ballast tank, including stiffening system **(C)** All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches	**(A)** All shell frames in the forward and one other selected cargo hold and 50% of frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating **(B)** All transverse webs with associated plating and longitudinals in each water ballast tank (i.e. topside, hopper side and side tank). **(B)** All transverse bulkheads in ballast tanks, including stiffening system Areas **(C), (D)** and **(E)** as for Special Survey II	**(A)** All shell frames in all cargo holds, including upper and lower end attachments and adjacent shell plating Areas **(B) - (E)** as for Special Survey III

(A) Cargo hold transverse frame.
(B) Transverse web or watertight transverse bulkhead in water ballast tanks.
(C) Cargo hold transverse bulkhead platings, stiffeners and girders.
(D) Cargo hold hatch covers and coamings.
(E) Deck plating inside line of hatch openings between cargo hold hatches.

Note: Close-up survey of transverse bulkheads to be carried out at four levels:
Level (a) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
Level (b) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
Level (c) About mid-height of the bulkhead.
Level (d) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tank.

TABLE II Close-up Survey - Double-Side Skin Bulk Carriers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
(A) One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type. This is to include the foremost topside and double-side water ballast tanks on either side	**(A)** One transverse web with associated plating and longitudinals as applicable in each water ballast tank **(A)** Forward and aft transverse bulkheads including stiffening system in a transverse section including topside, hopper side and double-side ballast tanks	**(A)** All transverse webs with associated plating and longitudinals as applicable in each water ballast tank **(B)** All transverse bulkheads including stiffening system in each water ballast tank **(B)** 25% of ordinary transverse web frames in all double-side tanks	**(A)** All transverse webs with associated plating and longitudinals as applicable in each water ballast tank **(A)** All transverse bulkheads including stiffening system in each water ballast tank **(B)** All ordinary transverse frames in all double-side tanks
(C) Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted	**(B)** One transverse web with associated plating and longitudinals in each water ballast tank **(B)** 25% of ordinary transvers web frames in the foremost double-side tanks	**(C)** All cargo hold transverse bulkheads including internal structure of upper and lower stools, where fitted	Areas **(C), (D)** and **(E)** as for Special Survey III
(D) All cargo hold hatch covers and coamings (plating and stiffeners)	**(C)** One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches	Areas **(D)** and **(E)** as for Special Survey II	

(A) Transverse web frame or watertight transverse bulkhead in topside, hopper side and double-side ballast tanks. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.
(B) Ordinary transverse frame in double-side tanks.
(C) Cargo hold transverse bulkhead, plating, stiffeners and girders.
(D) Cargo hold hatch covers and coamings.
(E) Deck plating and under-deck structure inside line of hatch openings between cargo hold hatches.

Note: Close-up survey of transverse bulkheads should be carried out at four levels:
Level (a) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
Level (b) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
Level (c) About mid-height of the bulkhead.
Level (d) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

TABLE III Close-up Survey - Ore carriers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
(A) One web frame ring complete including adjacent structural members in a ballast wing tank **(A)** One transverse bulkhead lower part – including girder system and adjacent structural members – in a ballast tank **(C)** Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(D)** All cargo hold hatch covers and coamings (plating and stiffeners)	**(A)** All web frame rings complete including adjacent structural members in a ballast wing tank **(A)** One deck transverse including adjacent deck structural members in each remaining ballast tank **(A)** Forward and aft transverse bulkheads complete – including girder system and adjacent structural members – in a ballast wing tank **(A)** One transverse bulkhead lower part – including girder system and adjacent structural members – in each remaining ballast tank **(C)** One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches	**(A)** All web frame rings complete including adjacent structural members in each ballast tank **(A)** All transverse bulkheads complete – including girder system and adjacent structural members – in each ballast tank **(A)** One web frame ring complete including adjacent structural members in each wing void space **(A)** Additional web frame rings in void spaces as deemed necessary **(C)** All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches	as for Special Survey III

(A) Transverse web frame or watertight transverse bulkhead in ballast wing tanks and void spaces. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.
(C) Cargo hold transverse bulkhead plating, stiffeners and girders.
(D) Cargo hold hatch covers and coamings.
(E) Deck plating and under deck structure inside line of hatch openings between cargo hold hatches.

Note: Close-up survey of transverse bulkheads should be carried out at four levels:
Level (a) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
Level (b) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
Level (c) About mid-height of the bulkhead.
Level (d) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

TABLE IV Fuel oil tanks in the cargo length area, survey requirements

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
None	One	Two	Half, minimum two

Notes:
1. These requirements apply to tanks of integral (structural) type.
2. If a selection of tanks is accepted to be examined, then different tanks should be examined at each renewal survey, on a rotational basis.
3. Peak tanks (all uses) should be examined internally at each renewal survey.
4. At renewal survey No.3 and subsequent renewal surveys, one deep tank for fuel oil in the cargo area should be included, if fitted.

TABLE V Thickness measurements at Special Surveys - Bulk Carriers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
1. Suspect areas	1. Suspect areas 2. Within the cargo length: Two transverse sections of deck plating outside line of cargo openings. 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table I* 4. Wind and water strakes in way of the transverse sections considered under point 2 above 5. Selected wind and water strakes outside the cargo length area 6. Additional thickness measurements to the side shell and brackets on ships subject to compliance with resolution MSC.168(79), as per IMO Resolution 1049(27)	1. Suspect areas 2. Within the cargo length area: a) Each deck plate outside line of cargo hatch openings b) Two transverse sections, one of which in the midship area, outside line of cargo hatch openings 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table I* 4. All wind and water strakes within the cargo length area 5. Selected wind and water strakes outside the cargo length area 6. Additional thickness measurements to the side shell and brackets on ships subject to compliance with resolution MSC.168(79), as per IMO Resolution 1049(27) 7. Additional thickness measurements applicable to the vertically corrugated transverse bulkhead between cargo holds No.1 and No.2, for Bulk Carriers of 150 m in length and above, carrying solid bulk cargoes having density of 1.78 t/m^3 and above, as per Annex 11 of IMO Resolution A.1049(27).	1. Suspect areas 2. Within the cargo length area: a) Each deck plate outside line of cargo hatch openings b) Three transverse sections, one of which in the midship area, outside line of cargo hatch openings c) Each bottom plate 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table I* 4. All wind and water strakes, full length 5. Additional thickness measurements to the side shell and brackets on ships subject to compliance with resolution MSC.168(79), as per Annex 15 of IMO Resolution A.1049(27) 6. Additional thickness measurements applicable to the vertically corrugated transverse bulkhead between cargo holds No.1 and No.2, for Bulk Carriers of 150 m in length and above, carrying solid bulk cargoes having density of 1.78 t/m^3 and above, as per Annex 11 of IMO Resolution A.1049(27).

TABLE VI Thickness measurements at Special Surveys - Double-Side Skin Bulk Carriers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
1. Suspect areas	1. Suspect areas 2. Within the cargo length: Two transverse sections of deck plating outside line of cargo openings 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table II* 4. Wind and water strakes in way of the transverse sections considered under point 2 above. 5. Selected wind and water strakes outside the cargo length area	1. Suspect areas 2. Within the cargo length area: a) Each deck plate outside line of cargo hatch openings b) Two transverse sections, one of which in the midship area, outside line of cargo hatch openings 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table II* 4. All wind and water strakes within the cargo length area 5. Selected wind and water strakes outside the cargo length area	1. Suspect areas 2. Within the cargo length area: a) Each deck plate outside line of cargo hatch openings b) Three transverse sections, one of which in the midship area, outside line of cargo hatch openings c) Each bottom plate 3. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to Close-up Survey according to *Table II* 4. All wind and water strakes, full length

TABLE VII – Sheet 1 Requirements for extent of thickness measurements at areas of substantial corrosion. Bulk Carriers.

SHELL PLATING

Structural member	Extent of measurement	Pattern of measurement
1. Bottom and side shell plating	a) Suspect plate plus four adjacent plates b) See other tables for particulars on gauging in way of tanks and cargo holds	Five-point pattern for each panel between longitudinals
2. Bottom / side shell longitudinals	Minimum of 3 longitudinals in way of suspect areas	Three measurements in line across web and 3 measurements on flange Three measurements on flange

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 shell plate	a) Five-point pattern between stiffeners over 1 metre length b) Ditto
2. Transverse bulkhead	a) Transverse band at approximately mid-height b) Transverse band at part of bulkhead adjacent to upper deck or below upper stool shell plate (for ships fitted with upper stools)	a) Five-point pattern over 1 m^2 of plating b) Five-point pattern over 1 m^2 of plating

TABLE VII - Sheet 2 Requirements for extent of thickness measurements at areas of substantial corrosion. Bulk Carriers.

DECK STRUCTURE INCLUDING CROSS STRIPS, MAIN CARGO HATCHWAYS, HATCH COVERS, COAMINGS AND TOPSIDE TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Cross-deck strip plating	Suspect cross-deck strip plating	Five-point pattern between underdeck stiffeners over 1 m length
2. Under-deck stiffeners	a) Transverse members	a) Five-point pattern at each end and mid-span
	b) Longitudinal member	b) Five-point pattern on both web and flange
3. Hatch covers	a) Side and end skirts, each three locations.	a) Five-point pattern at each location
	b) Three longitudinal bands, outboard strakes (2) and centreline strake (1)	b) Five-point measurement each band
4. Hatch coamings	Each side and end of coaming, one band lower third, one band upper two thirds of coaming	Five-point measurement at each band, i.e. end or side of coaming
5. Topside water ballast tanks	a) Watertight transverse bulkheads	
	i. Lower third of bulkhead	i. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of bulkhead	ii. Five-point pattern over 1 m^2 of plating
	iii. Stiffeners	iii. Five-point pattern over 1 m length
	b) Two representative swash transverse bulkheads	
	i. Lower third of bulkhead	i. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of bulkhead	ii. Five-point pattern over 1 m^2 of plating
	iii. Stiffeners	iii. Five-point pattern over 1 m length
	c) Three representative bays of slope plating	
	i. Lower third of tank	i. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of tank	ii. Five-point pattern over 1 m^2 of plating
	d) Longitudinals, suspect and adjacent	d) Five-point pattern both web and flange over 1 m length
6. Main deck plating	Suspect plates and adjacent (4)	Five-point patter over 1 m^2 of plating
7. Main deck longitudinals	Minimum of three longitudinals where plating measured	Five-point pattern on both web and flange over 1 m length
8. Web frames / transverses	Suspect plates	Five-point pattern over 1m^2

TABLE VII – Sheet 3 Requirements for extent of thickness measurements at areas of substantial corrosion. Bulk Carriers.

DOUBLE BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Inner/Double bottom plating	Suspect plate plus all adjacent plates	Five-point pattern for each panel between longitudinals over 1 m length
2. Inner/Double bottom longitudinals	Three longitudinals where plates measured	Three measurements in line across web, and three measurements on flange
3. Longitudinal girders of transverse floors.	Suspect plates	Five-point pattern over about $1m^2$
4. Watertight bulkheads (WT floors)	a) lower third of tank b) upper two thirds of tank	a) Five-point pattern over $1m^2$ of plating b) Five-point pattern alternate plates over $1m^2$ of plating
5. Web frames	Suspect plates	Five-point pattern over $1m^2$ of plating
6. Bottom/Side shell longitudinals	Minimum of three longitudinals in way of suspect areas	Three measurements in line across web Three measurements on flange

CARGO HOLDS

Structural member	Extent of measurement	Pattern of measurement
1. Side shell frames	Suspect frame and each adjacent	a) At each end and mid span: five-point pattern of both web and flange b) Five-point pattern with 25 mm of welded attachment to both shell and lower slope plate

TABLE VIII – Sheet 1 Requirements for extent of thickness measurements at areas of substantial corrosion. Double-Side Skin Bulk Carriers.

BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Bottom, inner bottom and hopper structure plating	Minimum of three bays across double-bottom tank, including aft bay Measurements around and under all suction bell mouths	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 about $2m^2$
5. Hopper structure web frame ring	Three floors in bays where bottom plating measured	Five-point pattern over 1 m^2 of plating Single measurements on flange
6. Hopper structure transverse watertight bulkhead or swash bulkhead	– lower third of bulkhead – upper two thirds of bulkhead – stiffeners (minimum of three)	Five-point pattern over 1 m^2 of plating Five-point pattern over 2 m^2 of plating For web, five-point pattern over span (two measurements across web at each end and one at centre of span). For flange, single measurements at each end and centre of span
7. Panel stiffening	Where applicable	Single measurements

TABLE VIII - Sheet 2 Requirements for extent of thickness measurements at areas of substantial corrosion. Double-Side Skin Bulk Carriers.

DECK STRUCTURE INCLUDING CROSS STRIPS, MAIN CARGO HATCHWAYS, HATCH COVERS, COAMINGS AND TOPSIDE TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Cross-deck strip plating	Suspect cross-deck strip plating	Five-point pattern between underdeck stiffeners over 1 m length
2. Under-deck stiffeners	c) Transverse members	c) Five-point pattern at each end and mid-span
	d) Longitudinal member	d) Five-point pattern on both web and flange
3. Hatch covers	a) Side and end skirts, each three locations.	c) Five-point pattern at each location
	b) Three longitudinal bands, outboard strakes (2) and centreline strake (1).	d) Five-point measurement each band
4. Hatch coamings	Each side and end of coaming, one band lower third, one band upper two thirds of coaming	Five-point measurement at each band, i.e. end or side of coaming
5. Topside water ballast tanks	a) Watertight transverse bulkheads	
	i. Lower third of bulkhead	iv. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of bulkhead	v. Five-point pattern over 1 m^2 of plating
	iii. Stiffeners	vi. Five-point pattern over 1 m length
	b) Two representative swash transverse bulkheads	
	i. Lower third of bulkhead	iv. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of bulkhead	v. Five-point pattern over 1 m^2 of plating
	iii. Stiffeners	vi. Five-point pattern over 1 m length
	c) Three representative bays of slope plating	
	i. Lower third of tank	iii. Five-point pattern over 1 m^2 of plating
	ii. Upper two thirds of tank	iv. Five-point pattern over 1 m^2 of plating
	d) Longitudinals, suspect and adjacent	d) Five-point pattern both web and flange over 1 m length
6. Main deck plating	Suspect plates and adjacent (4)	Five-point patter over 1 m^2 of plating
7. Main deck longitudinals	Minimum of three longitudinals where plating measured	Five-point pattern on both web and flange over 1 m length
8. Web frames / transverses	Suspect plates	Five-point pattern over 1 m^2

TABLE VIII - Sheet 3 Requirements for extent of thickness measurements at areas of substantial corrosion. Double-Side Skin Bulk Carriers.

STRUCTURE IN DOUBLE-SIDE SPACES OF DOUBLE-SIDE SKIN BULK CARRIERS INCLUDING WING VOID SPACES OF ORE CARRIERS

Structural member	Extent of measurement	Pattern of measurement
1. Side shell and inner plating:		
i. Upper strake and strakes in way of horizontal girders	i. Plating between each pair of transverse frames/longitudinals in a minimum of three bays (along the tank)	i. Single measurement
ii. All other strakes	ii. Plating between every third pair of longitudinals in same three bays	ii. Single measurement
2. Side shell and inner side transverse frames/ longitudinals on:		
i. upper strake	i. Each transverse frame/ longitudinal in same three bays	i. Three measurements across web and one measurement on flange
ii. all other strakes	ii. Every third transverse frame/longitudinal in same three bays	ii. Three measurements across web and one measurement on flange
3. Transverse frames/ longitudinals: brackets	Minimum of three at top, middle and bottom of tank in same three bays	Five-point pattern over area of bracket
4. Vertical web and transverse bulkheads:		
i. strakes in a way of horizontal girders	i. Minimum of two webs and both transverse bulkheads	i. Five-point pattern over approximately 2 m^2 area
ii. other strakes	ii. Minimum of two webs and both transverse bulkheads	ii. Two measurements between each pair of vertical stiffeners
Horizontal girders	Plating on each girder in a minimum of three bays	Two measurements between each pair of longitudinal girder stiffeners
Panel stiffening	Where applicable	Single measurements

TABLE VIII - Sheet 4 Requirements for extent of thickness measurements at areas of substantial corrosion. Double-Side Skin Bulk Carriers.

TRANSVERSE BULKHEADS IN CARGO HOLDS

Structural member	Extent of measurement	Pattern of measurement
Lower stool, where fitted	i. Transverse band within 25 mm of welded connection to inner bottom ii. Transverse bands within 25 mm of welded connection to shelf plate	i. Five-point pattern between stiffeners over 1 m length ii. Five-point pattern between stiffeners over 1 m length
Transverse bulkheads	i. Transverse band at approximately mid height ii. Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with upper stools)	i. Five-point pattern over 1 m^2 of plating ii. Five-point pattern over 1 m^2 of plating

SECTION 4
Hull Surveys of Oil Tankers

Unless expressly provided otherwise, the present Section, apply to all self-propelled, Double Hull Oil Tankers and Oil Tankers other than Double Hull, of 500 GT and above.

4.1 Annual Survey

4.1.1 Schedule

4.1.1.1 Annual Surveys are to be held within 3 months before or after anniversary date from date of the Initial Class Survey or of the date credited for the last Special Survey.

4.1.2 Scope

4.1.2.1 The Annual Survey is to ensure that the cargo handling installations and pertinent safety equipment are in good working order. Surveys are preferably to be carried out during loading or discharging operations.

4.1.2.2 For the aforementioned Survey, access to cargo holds/tanks or other spaces within the cargo area necessitating gas freeing is not required normally, unless checking of the equipment for correct functioning is not possible otherwise.

4.1.3 Examination of the hull

4.1.3.1 Examination of the hull plating and its closing appliances as far as can be seen.

4.1.3.2 Examination of watertight penetrations as far as practicable.

4.1.4 Weather decks

4.1.4.1 For weather decks the Survey will consist of the following:

(a) Examination of cargo tank openings including gaskets, covers, coamings and flame screens.
(b) Examination of cargo tank pressure/vacuum valves and flame screens.
(c) Examination of flame screens on vents to all bunker, oily ballast and slop tanks and void spaces.
(d) Examination of cargo, crude oil washing, bunker, ballast and vent piping systems, including remote control valves, safety valves and various safety devices, as well as vent masts and headers.

4.1.5 Cargo pump rooms and pipe tunnels

4.1.5.1 For cargo pump rooms and pipe tunnels the Survey will consist of:

(a) Confirmation that potential sources of ignition in or near the cargo pump room are eliminated, such as loose gear, excessive product in bilges, excessive vapours, combustible materials, etc. and that access ladders are in satisfactory condition.
(b) Examination of pump room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of penetrations in pump room bulkheads.
(c) Examination of the condition of all piping systems in cargo pump rooms and pipe tunnels (if any).
(d) Examination, as far as practicable, of cargo, bilge, ballast and stripping pumps for excessive gland seal leakage, verification of proper operation of electrical and mechanical remote operating and shutdown devices and operation of pump room bilge system, and checking that pump foundations are intact.
(e) Confirmation that the pump room ventilation system is operational, ducting intact and that dampers are operational and screens clean.

4.1.6 Electrical installations

4.1.6.1 In gas-dangerous spaces and zones the electrical equipment, including cables and their supports is to be visually examined, particularly regarding explosion protection.

4.1.7. Fire-extinguishing systems

4.1.7.1 The Annual Survey of the fire-extinguishing systems will include:

(a) External inspection of all systems for the cargo tank area, including the pump room.
(b) Checking of the foam fire extinguishing and/or water spraying system on deck, including the supplies of foam concentrate and testing that the minimum number of jets of water at the required pressure in the fire main is obtained, when the system is in operation.

4.1.8 Inert gas systems

4.1.8.1 Annual Survey of the inert gas system will include:

(a) External examination of important system components for wear and corrosion.
(b) External examination of piping, fittings and safety equipment, including operational test of the blowers.
(c) Checking of the soot blowers as to interlocking.
(d) Checking of the alarm, recording and safety equipment.

4.1.9 Ballast tanks

4.1.9.1 Ballast tanks are to be examined when required as a consequence of the results of the Special and Intermediate Surveys.

4.1.9.2 When deemed necessary by the Surveyor, or when extensive corrosion exists, thickness measurements are to be carried out and, if the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with *Table V or Table VI*, for Oil Tankers and Double Hull Oil Tankers, respectively. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous survey are to have thickness measurements taken.

4.1.9.3 For **Oil Tankers exceeding 15 years** of age **all ballast tanks adjacent to** (i.e. with a common plane boundary) **a cargo tank with heating coils** are to be examined internally. When deemed necessary by the Surveyor, thickness measurements are to be carried out and, if the results of these measurements indicate that substantial corrosion is present, the extent of thickness measurements is to be increased in accordance with *Table IV*.

4.1.9.4 Tanks or areas where coating was found to be in GOOD condition at the previous Intermediate or Special Survey may be specially considered by the Society.

4.1.10 Miscellaneous

4.1.10.1 On the occasion of the Annual Survey the following items are also to be examined:
(a) Special arrangements related to damage control, e.g. sliding bulkhead doors in accordance with the approved damage control plan.
(b) Cargo sample stowage spaces.
(c) Gas detection instruments.
(d) Cargo information, safety instructions.
(e) Level indicators systems, high level alarms and if any, valves associated with overflow control.

4.2 Intermediate Survey

4.2.1 Schedule

4.2.1.1 The Intermediate Survey is to be held at or between either the 2nd or 3rd Annual Survey.

4.2.1.2 The following requirements, which are additional to the requirements of the Annual Surveys, may be surveyed either at or between the 2nd and 3rd Annual Survey.

4.2.2 Scope - General

4.2.2.1 The scope of the Intermediate Survey of **cargo and ballast tanks** dependent on the age of the vessel is specified in *4.2.3* to *4.2.5*.

4.2.2.2 For **weather decks**, an examination as far as practicable of cargo, crude oil washing, bunker, ballast, steam and vent piping systems as well as vent masts and headers is to be carried out. If upon examination there is any doubt as to the condition of the piping, the piping may be required to be pressure tested, thickness measured or both.

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

4.2.3 Ships 5 – 10 years of age

4.2.3.1 The provisions of *4.2.2.2* are to be met.

4.2.3.2 For **Double Hull Oil Tankers**, an overall survey of representative tanks, used for salt-water ballast, selected by the Surveyor should be carried out. If the overall survey of salt water ballast tanks reveals no visible structural defects, the examination may be limited to verification that the protective coatings remain in GOOD condition.

4.2.3.3 For **Oil Tankers other than Double Hull**, all Ballast Tanks are to be examined. When considered necessary by the surveyor, thickness measurements and testing are to be carried out to ensure that the structural integrity remains effective.

4.2.3.4 A Ballast Tank is to be examined at subsequent annual intervals where :
(a) a hard protective coating has not been applied from the time of construction, or
(b) a soft or semi-hard coating has been applied, or
(c) substantial corrosion is found within the tank, or
(d) the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

4.2.3.5 In addition to the requirements above, suspect areas identified at previous surveys are to be examined.

4.2.4 Ships 10 to 15 years of age

4.2.4.1 The requirements of the Intermediate Survey are to be to the same extent as the previous Special Survey. However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of Hull Girder as required in *Sec 1 para 1.13.2*, are not required, unless deemed necessary by the attending Surveyor.

4.2.4.2 In application of *4.2.4.1*, the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey.

4.2.4.3 In application of *4.2.4.1*, an underwater survey may be considered in lieu of the requirements for Dry-Docking survey.

4.2.5 Ships over 15 years of age

4.2.5.1 The requirements of the Intermediate Survey should be to the same extent as the previous Special Survey. However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of Hull Girder as required in *Sec 1 para 1.13.2*, are not required unless deemed necessary by the attending surveyor.

4.2.5.2 In application of *4.2.5.1* the Intermediate Survey may be commenced at the second Annual Survey and be progressed during the succeeding year with a view to completion at the third Annual Survey.

4.2.5.3 In application of *4.2.5.1*, a survey in dry-dock should be part of the Intermediate Survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and water ballast tanks should be carried out in accordance with the applicable requirements for Intermediate Surveys, if not already carried out.

Note: Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

4.2.6 Electrical installations

4.2.6.1 Irrespective of the vessel's age electrical equipment cables in gas-dangerous spaces, such as pump rooms and spaces adjacent to cargo tanks, are to be inspected and insulation measurements are to be carried out. Any measurement protocols kept on board may be considered.

4.2.6.2 For **ships aged 10 years or over**, in gas-dangerous areas the following additional checks are to be made:

(a) Protective earthing of system components (spot checks).
(b) Integrity of certified safe-type equipment.
(c) Damages to outer sheet of cables.
(d) Function testing of pressurized equipment and of associated alarms.

4.3 Special Survey

4.3.1 General

4.3.1.1 Special Surveys are to be carried out at 5-yearly intervals to renew the Certificate of Class.

4.3.1.2 The first Special Survey is to be completed within 5 years from the date of the Initial Class Survey and thereafter within 5 years from the credited date of the previous Special Survey. However, an extension of class of 3 months maximum beyond the 5th year can be granted under exceptional circumstances. In this case, the next period of class will start from the expiry date of the Special Survey before the extension was granted.

4.3.1.3 For surveys completed within 3 months before the expiry date of the Special Survey, the next class period will start from the expiry date of the Special Survey. For surveys completed more than 3 months before the expiry date of the Special Survey, the class period will start from the survey completion date.

4.3.1.4 The Special Survey may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date.

4.3.1.5 As part of the preparation for the Special Survey, the Survey Programme should be dealt with, in advance of the Special Survey. The thickness measurements are not to be held before the 4th Annual Survey.

4.3.1.6 The Special Survey is to include, in addition to the requirements of the Annual Survey, examinations, tests and checks of sufficient extent to ensure that the hull and related piping is in a satisfactory condition and is fit for its intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to Periodical Surveys being carried out at the due dates.

4.3.1.7 All cargo tanks, salt water ballast tanks including double bottom tanks, and any other tanks in double-hull spaces, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required by *4.3.5* and *4.3.6*, to ensure that the structural integrity remains effective. The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

4.3.1.8 Cargo piping on deck, including Crude Oil Washing (COW) piping, and cargo and ballast piping within the above tanks and spaces are to be examined and operationally tested to working pressure to the Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

4.3.1.9 Special attention is to be given to any ballast piping in cargo tanks and any cargo piping in ballast tanks and void spaces, and Surveyors are to be advised on all occasions when this piping, including valves and fittings,

are opened out during repair periods and can be examined internally.

4.3.1.10 The survey extent of combined ballast/cargo tanks should be evaluated based on the records of ballast history and extent of the corrosion prevention system provided.

4.3.2 Dry-Dock Survey

4.3.2.1 A survey in dry-dock should be a part of the Special Survey. There should be a minimum of two inspections of the outside of the ship's bottom during the five-year of the Class period. In all cases, the maximum interval between bottom inspections should not exceed 36 months.

4.3.2.2 For ships of 15 years of age and over, inspection of the outside of the ship's bottom should be carried out with the ship in dry-dock. For ships of less than 15 years of age, alternate inspections of the ship's bottom not conducted in conjunction with the Special Survey may be carried out with the ship afloat. Inspection of the ship afloat should only be carried out when the conditions are satisfactory and the proper equipment and suitably qualified staff is available.

4.3.2.3 If a survey in dry-dock is not completed in conjunction with the Special Survey or if the 36 month maximum interval referred to in *4.3.2.1* is not complied with, the Class Certificate should cease to be valid until a survey in dry-dock is completed.

4.3.2.4 The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks should be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.

Note: Lower portions of the cargo and ballast tanks are considered to be the parts below light ballast water line.

4.3.3 Tank protection

4.3.3.1 Where provided, the condition of the corrosion prevention system of cargo tanks should be examined. A ballast tank should be examined at subsequent annual intervals where:

(a) a hard protective coating has not been applied from the time of construction; or
(b) a soft or semi-hard coating has been applied; or
(c) substantial corrosion is found within the tank; or
(d) the hard protective coating is found to be in less than GOOD condition and the hard protective coating is not repaired to the satisfaction of the surveyor.

Thickness measurement should be carried out as deemed necessary by the surveyor.

4.3.4 Extent of Overall and Close-up Surveys

4.3.4.1 An Overall survey of all tanks and spaces is to be carried out at each Special Survey. Suspect areas identified at previous surveys should be examined.

4.3.4.2 The minimum requirements for close-up surveys of Oil Tankers and Double Hull Oil Tankers, at Special Survey, are given in *Table I or Table II* respectively.

4.3.4.3 The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion protection system and also in the following cases:

(a) In particular, tanks having structural arrangements or details which have undergone defects in similar tanks or on similar ships according to available information.
(b) In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

4.3.4.4 For areas in tanks where hard protective coatings are found to be in GOOD condition, the extent of close-up surveys may be specially considered by the Society.

4.3.5 Extent of Thickness measurements at Special Survey

4.3.5.1 The minimum requirements for the thickness measurements of Oil Tankers and Double Hull Oil Tankers at Special Survey are given in *Table III*.

4.3.5.2 Provisions for extended measurements in areas with substantial corrosion, of Oil Tankers and Double Hull Oil Tankers, are given in *Tables V* and *VI* respectively, and may be additionally specified in the Survey Programme as required in *Sec 1 Sub 1.5*. These extended thickness measurements should be carried out before the survey is credited as completed. Suspect areas identified at previous surveys should have thickness measurements taken.

4.3.5.3 The Surveyor may further extend the thickness measurements as deemed necessary.

4.3.5.4 For areas in tanks where coating is found to be in a GOOD condition the extent of thickness measurements according to *Table III* may be specially considered by the Society.

4.3.5.5 Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements. In cases where two or three sections are to be measured, at least one is to include a ballast tank within 0.5*L* amidships.

4.3.5.6 In case of Oil Tankers of 130 m in length and upwards and more than 10 years of age, the evaluation of the ship's longitudinal strength is required as per *Sec 1 para 1.13.2*.

4.3.6 Extent of tank pressure testing

4.3.6.1 The minimum requirements for tank pressure testing, at Special Survey are given in *Table IV*.

4.3.6.2 The Surveyor may extend the tank testing as deemed necessary.

4.3.6.3 Boundaries of ballast tanks should be tested with a head of liquid to the top of air pipes.

4.3.6.4 Boundaries of cargo tanks should be tested to the highest point that liquid will rise under service conditions.

4.3.6.5 The testing of double-bottom tanks and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tanktop is carried out.

4.3.7 Essential auxiliaries and piping systems in cargo tank area

4.3.7.1 In addition to the requirements for the Annual Survey, the Special Survey will consist of the operations described under *4.3.7.2* to *4.3.7.8*.

4.3.7.2 Cargo, ballast, stripping and venting piping are examined to the Surveyor's satisfaction. Dismantling and / or thickness measurements may be required. Tightness or working tests are to be carried out. In case of doubt, repairs or dismantling on cargo or ballast piping, a hydraulic or hydropneumatic test is to be carried out. It is verified that cargo pipes are electrically bonded to the hull.

4.3.7.3 All safety valves on cargo piping and of cargo tanks are to be dismantled for examination, adjusted and, as applicable, released.

4.3.7.4 Cargo, ballast and stripping pumps are to be internally examined and prime movers are to be checked. A working test is to be carried out.

4.3.7.5 All cargo pump room boundaries are to be generally examined. All gas-tight shaft sealings are to be examined. Bottom of cargo pump room is to be examined for cleanliness, stripping and gutters.

4.3.7.6 Crude oil washing (if fitted) pipings, pumps, valves and deck mounted washing machines are to be examined and tested for signs of leakage, and anchoring devices of deck mounted washing machines are to be checked to the Surveyor's satisfaction.

4.3.7.7 A general examination of the electrical equipment and cables in dangerous zones such as cargo pump rooms and areas adjacent to cargo tanks is to be carried out for a defective degree of protection of lights and fixtures, improperly installed wiring, non-approved lighting and fixtures and dead ended wiring.

4.3.7.8 An insulation test of circuits is to be carried out. In cases where a proper record of testing is maintained, consideration should be given to accept recent readings by the crew. If any of the readings are marginal, or if the condition of the cables, fixtures or equipment appears defective in any way, verification measurements may be required. These measurements should not be attempted until the ship is in a gas-free or inerted condition and are to be carried out within an acceptable period of time.

TABLE I Minimum requirements for Close-up Survey - Oil tankers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
(A) One web frame ring in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast **(B)** One deck transverse in a cargo tank **(D)** One transverse bulkhead: – In a ballast tank – In a cargo wing tank – In a cargo centre tank	**(A)** All web frame rings in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast **(B)** One deck transverse: – In each of the remaining ballast tanks, if any – In a cargo wing tank – In 2 cargo centre tanks **(C)** Both transverse bulkheads in a wing ballast tank, if any, or a cargo wing tank used primarily for water ballast **(D)** One transverse bulkhead: – In each remaining ballast tank – In a cargo wing tank – In 2 cargo centre tanks	**(A)** All web frame rings in all ballast tanks **(A)** All web frame rings in a cargo wing tank **(A)** A minimum of 30% of all web frame ring in each remaining cargo wing tank (see note 1) **(C)** All transverse bulkheads in all cargo and ballast tanks **(E)** A minimum of 30% of deck and bottom transverses including adjacent structural members in each cargo centre tank (see note 1) **(F)** As deemed necessary by the Surveyor	As for Special Survey III Additional transverse areas as deemed necessary by the Surveyor

(A) Complete transverse web frame ring including adjacent structural members.
(B) Deck transverse including adjacent deck structural members.
(C) Transverse bulkhead complete including girder system and adjacent members.
(D) Transverse bulkhead lower part including girder system and adjacent structural members.
(E) Deck plating bottom transverse including adjacent structural members.
(F) Additional complete transverse web frame ring.

Note 1: The 30% should be rounded top to the next whole integer.

TABLE II Minimum requirements for Close-up Survey - Double Hull Oil Tankers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
One web frame (1), in a complete ballast tank *(see Note 1)*	All web frames (1), in a complete ballast tank *(see Note 1)* The knuckle area and the upper part (5 m approximately) of one web frame in each remaining ballast tank (6)	All web frames (1), in all ballast tanks	As for ships referred to in column 3 Additional transverse areas as deemed necessary by the Surveyor
One deck transverse, in a cargo oil tank (2)	One deck transverse, in two cargo oil tanks (2)	All web frames (7), including deck transverse and cross ties, if fitted, in a cargo oil tank One web frame (7), including deck transverse and cross ties, if fitted, in each remaining cargo oil tank All transverse bulkheads, in all cargo oil (3) and ballast (4) tanks	
One transverse bulkhead (4), in a complete ballast tank *(see Note 1)*	One transverse bulkhead (4), in each complete ballast tank *(see Note 1)*		
One transverse bulkhead (5) in a cargo oil centre tank One transverse bulkhead (5), in a cargo oil wing tank *(see Note 2)*	One transverse bulkhead (5), in two cargo oil centre tanks One transverse bulkhead (5), in a cargo oil wing tank *(see Note 2*)		

Notes:
(1), (2), (3), (4), (5), (6) and (7) are areas to be subjected to Close-up surveys and thickness measurements

(1) Web frame in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double-bottom tank and deck transverse in double-deck tank (where fitted), including adjacent structural members. In fore and aft peak tanks web frame means a complete transverse web frame ring including adjacent structural members.
(2) Deck transverse, including adjacent deck structural members (or external structure on deck in way of the tank, where applicable).
(3) Transverse bulkhead complete in cargo tanks, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.
(4) Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double-bottom tanks, inner bottom plating, hopper side, connecting brackets.
(5) Transverse bulkhead lower part in cargo tank, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower stool, where fitted.
(6) The knuckle area and the upper part (5 m approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 m from the corners both on the bulkhead and the double bottom.
(7) Web frame in a cargo oil tank means deck transverse, longitudinal bulkhead vertical girder and cross ties, where fitted, including adjacent structural members.

Note 1: Complete ballast tank: means double-bottom tank plus double-side tank plus double-deck tank, as applicable, even if these tanks are separate.

Note 2: Where no centre cargo tanks are fitted (as in the case of centre longitudinal bulkhead), transverse bulkheads in wing tanks should be surveyed.

TABLE III
Thickness measurements at Special Surveys –Oil Tankers and Double Hull Oil Tankers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III 10 < Age ≤ 15 years	Special Survey IV and Subsequent Age > 15 years
1. One section of deck plating for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast) 2. Measurements of structural members subject to Close-up Survey according to *Table I or Table II*, for general assessment and recording of corrosion pattern 3. Suspect areas	1. Within the cargo area: – Each deck plate – One transverse section 2. Measurements of structural members subject to Close-up Survey according to *Table I or Table II* for general assessment and recording of corrosion pattern 3. Suspect areas 4. Selected wind and water strakes outside the cargo length	1. Within the cargo area: – Each deck plate. – Two transverse sections. (see Note 1) – All wind and water strakes 2. Measurements of structural members subject to Close-up Survey according to *Table I or Table II* for general assessment and recording of corrosion pattern 3. Suspect areas 4. Selected wind and water strakes outside the cargo length	1. Within the cargo area: – Each deck plate – Three transverse sections.(see Note 1) – Each bottom plate 2. Measurements of structural members subject to Close-up Survey according to *Table I or Table II* for general assessment and recording of corrosion pattern 3. Suspect areas 4. All wind and water strakes in full length

NOTES:
1. For Oil Tankers, at least one section should include a ballast tank within 0.5L amidships
For Double Hull Oil Tankers, at least one section should be within 0.5L

TABLE IV(a)
Tank testing at Special Survey –Oil Tankers

Special Survey I Age of ship ≤ 5 years	Special Survey II and subsequent Age > 5 years
All ballast tank boundaries.	All ballast tank boundaries.
Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, fuel oil tanks, pump-rooms or cofferdams	All cargo tanks bulkheads

TABLE IV(b)
Tank testing at Special Survey – Double Hull Oil Tankers

Special Survey I Age of ship ≤ 5 years	Special Survey II 5 < Age ≤ 10 years	Special Survey III and subsequent Age > 10 years
All ballast tank boundaries.	All ballast tank boundaries.	All ballast tank boundaries.
Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels,representative fuel oil tanks, pump rooms or cofferdams	Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, representative fuel oil tanks, pump rooms or cofferdams	Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, representative fuel oil tanks, pump rooms or cofferdams
	All cargo tank bulkheads which form the boundaries of segregated cargoes	All remaining cargo tank bulkheads

TABLE V Sheet 1. Thickness measurements in areas within cargo tanks length with substantial corrosion Oil Tankers.

BOTTOM STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Bottom plating	Minimum of 3 bays across tank, including aft bay. Measurements around and under all bell mouths.	Five-point pattern for each panel between longitudinals and web.
2. Bottom longitudinals	Minimum of 3 longitudinals in each bay where bottom plating measured.	Three measurements in line across flange and 3 measurements vertically on web.
3. Bottom girders and brackets	At fore and aft transverse bulkhead brackets toes and in centre of tanks.	Vertical line of single measurements on web plating, with one measurement between each panel stiffener or a minimum of 3 measurements. Two measurements across face flat. Five-point pattern on girder/bulkhead brackets.
4. Bottom transverse webs	Three webs in bays where bottom plating measured, with measurements at both ends and in middle.	Five-point pattern over 2 m^2 area. Single measurements on face flat.
5. Panel stiffening	Where fitted.	Single measurements.

TABLE V Sheet 2. Thickness measurements in areas within cargo tanks length with substantial corrosion – Oil Tankers.

DECK STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Deck plating	Two bands across tank	Minimum of 3 measurements per plate per band.
2. Deck longitudinals	Minimum of 3 longitudinals in each of 2 bays.	Three measurements in line vertically on webs, and 2 measurements on flange (if fitted).
3. Deck girders and brackets	At fore and aft transverse bulkhead bracket toes and in centre of tanks.	Vertical line of single measurements on web plating with 1 measurement between each panel stiffener or a minimum of 3 measurements. Two measurements across face flat. Five-point pattern on girder/bulkhead brackets.
4. Deck transverse webs	Minimum of 2 webs, with measurements at middle and both ends of span.	Five-point pattern over about 2 m^2 areas. Single measurements on face flat.
5. Panel stiffening	Where available.	Single measurements.

SIDE SHELL AND LONGITUDINAL BULKHEADS

Structural member	Extent of measurement	Pattern of measurement
1. Deckhead and bottom strakes, strakes in way of stringer platforms.	Plating between each pair of longitudinals in a minimum of 3 bays.	Single measurement.
2. All other strakes.	Plating between every third pair of longitudinals in same 3 bays.	Single measurement.
3. Longitudinals - deckhead and bottom strakes	Each longitudinal in same 3 bays.	Three measurements across web and 1 measurement on flange.
4. All other longitudinals	Every third longitudinal in same 3 bays.	Three measurements across web and 1 measurement on flange.
5. Longitudinals - bracket	Minimum of 3 at top, middle and bottom of tank in same 3 bays.	5 point pattern over area of bracket.
6. Web frames and cross ties	Three webs with minimum 3 locations on each web, including in way of cross tie connections	5 point pattern over about 2 m^2 areas, plus single measurements on web frame and cross tie face flats.

TABLE V Sheet 3. Thickness measurements in areas within cargo tanks length with substantial corrosion – Oil tankers.

TRANSVERSE BULKHEADS AND SWASH BULKHEADS

Structural member	Extent of measurement	Pattern of measurement
1. Deckhead and bottom strakes, and strakes in way of stringer platforms	Plating between each pair of stiffeners at 3 locations: approx. ¼, ½ and ¾ width of tank.	Five-point pattern between stiffeners over 1 metre length.
2. All other strakes	Plating between pair of stiffeners at middle location.	Single measurement.
3. Strakes in corrugated bulkheads	Plating for each change of scantling at centre of panel and at flange or fabricated connection.	Five-point pattern over about 1 m^2 of plating.
4. Stiffeners	Minimum of 3 typical stiffeners	For web, five-point pattern over span between bracket connections (2 measurements across web at each bracket connection and 1 at centre of span). On flange, single measurements at each bracket toe and at centre of span.
5. Brackets	Minimum of 3 at top, middle and bottom of span.	Five-point pattern over areas of bracket.
6. Deep webs and girders	Measurements at toe of bracket and at centre of span	For web, five-point pattern over about one m^2; three measurements across face flat.
7. Stringer platforms	All stringers with measurements at both ends and middle.	For web, five-point pattern over 1 m^2 of area plus single measurements near bracket toes and on face flats.

TABLE VI Sheet 1. Thickness measurements in areas within cargo tanks length with substantial corrosion – Double Hull Oil Tankers

BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Bottom, inner bottom and hopper structure plating	Minimum of three bays across double-bottom tank, including aft bay Measurements around and under all suction bell mouths.	Five-point pattern for each panel between longitudinals and floors
2. Bottom, inner bottom and hopper structure longitudin	Minimum of three longitudinals in each bay where bottom plating measured	Three measurements in line across flange and three measurements on vertical web
3. Bottom girders, including the watertight ones	At fore and aft watertight floors and in centre of tanks	Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements.
4. Bottom floors, including the watertight ones	Three floors in bays where bottom plating measured, with measurements at both ends and middle	Five-point pattern over 2 m^2 area
5. Hopper structure web frame ring	Three floors in bays where bottom plating Measured	Five-point pattern over 1 m^2 of plating. Single measurements on flange
6. Hopper structure transverse watertight bulkhead or swash bulkhead	- lower third of bulkhead - upper two thirds of bulkhead - stiffeners (minimum of three)	Five-point pattern over 1 m^2 of plating. Five-point pattern over 2 m^2 of plating For web, five-point pattern over span (two measurements across web at each end and one at centre of span). For flange, single measurements at each end and centre of span
7. Panel stiffening	Where applicable	Single measurements

TABLE VI Sheet 2. Thickness measurements in areas within cargo tanks length with substantial corrosion – Double Hull Oil Tankers

DECK STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Deck plating	Two transverse bands across tank	Minimum of 3 measurements per plate per band.
2. Deck longitudinals	Every third longitudinal in each of 2 bands with minimum of one longitudinal.	Three measurements in line vertically on webs, and 2 measurements on flange.
3. Deck girders and brackets (usually in cargo tanks only)	At fore and aft transverse bulkhead bracket toes and in centre of tanks.	Vertical line of single measurements on web plating with 1 measurement between each panel stiffener or a minimum of 3 measurements. Two measurements across flange. Five-point pattern on girder/bulkhead brackets.
4. Deck transverse webs	Minimum of 2 webs, with measurements at middle and both ends of span.	Five-point pattern over about 1 m^2 area. Single measurements on flange.
5. Vertical web and transverse bulkhead in wing ballast tank (2m from deck)	Minimum of two webs and both transverse bulkheads.	Five-point pattern over about 1 m^2 area.
6. Panel stiffening	Where available.	Single measurements.

TABLE VI Sheet 3. Thickness measurements in areas within cargo tanks length with substantial corrosion – Double Hull Oil Tankers

STRUCTURE IN WING BALLAST TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Side shell and longitudinal bulkhead plating: - upper strake and strakes in way of horizontal girders - all other strakes	Plating between each pair of 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 longitudinal Bulkhead longitudinals on: - upper strake - all other strakes	Each longitudinal in same three bays Every third longitudinal in same three bays	Three measurements across web and one measurement on flange Three measurements across web and one measurement on flange
3. Longitudinals Brackets	Minimum of three at top, middle and bottom of tank in same three bays	Five-point pattern over area of bracket
4. Vertical web and transverse bulkheads (excluding deckhead area): - strakes in 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 approximately 2 m^2 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 VI Sheet 4. Thickness measurements in areas within cargo tanks length with substantial corrosion – Double Hull Oil Tankers

LONGITUDINAL BULKHEADS IN CARGO TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Deckhead and bottom strakes, strakes in way of horizontal stringers of transverse bulkheads	Plating between each pair of longitudinals in a minimum of 3 bays.	Single measurement.
2. All other strakes.	Plating between every third pair of longitudinals in same 3 bays.	Single measurement.
3. Longitudinals on deckhead and bottom strakes	Each longitudinal in same 3 bays.	Three measurements across web and 1 measurement on flange.
4. All other longitudinals	Every third longitudinal in same 3 bays.	Three measurements across web and 1 measurement on flange.
5. Longitudinals brackets	Minimum of 3 at top, middle and bottom of tank in same 3 bays.	5 point pattern over area of bracket.
6. Web frames and cross ties	Three webs with minimum 3 locations on each web, including in way of cross tie connections	5 point pattern over about 2 m^2 area of webs, plus single measurements on flanges of web frame and cross ties
7. Lower end brackets (opposite side of web frame)	Minimum of 3 brackets	Five-point pattern over approximately 2 m^2 area of brackets, plus single measurements on bracket flanges

TABLE VI Sheet 5. Thickness measurements in areas within cargo tanks length with substantial corrosion – Double Hull Oil Tankers

TRANSVERSE WATERTIGHT AND SWASH BULKHEADS IN CARGO TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Upper and lower stool, where fitted	Transverse band within 25 mm of welded connection to inner bottom/deck plating. Transverse band within 25 mm of welded connection to shelf plate	Five-point pattern between stiffeners over 1 metre length.
2. Deckhead and bottom strakes, and strakes in way of stringer platforms	Plating between each pair of stiffeners at 3 locations: approx. ¼, ½ and ¾ width of tank.	Five-point pattern between stiffeners over 1 metre length.
3. All other strakes	Plating between pair of stiffeners at middle location.	Single measurement.
4. Strakes in corrugated bulkheads	Plating for each change of scantling at centre of panel and at flange or fabricated connection.	Five-point pattern over about 1 m^2 of plating.
5. Stiffeners	Minimum of 3 typical stiffeners	For web, five-point pattern over span between bracket connections (2 measurements across web at each bracket connection and 1 at centre of span). On flange, single measurements at each bracket toe and at centre of span.
6. Brackets	Minimum of 3 at top, middle and bottom of span.	Five-point pattern over areas of bracket.
7. Horizontal Stringers	All stringers with measurements at both ends and middle.	Five-point pattern over 1 m^2 of area plus single measurements near bracket toes and on flanges.

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