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

November 2022

Part I
Classification and Survey Requirements

INSB RULES- PART I

Record of amendments

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4	Amendments to part I	Issue 01/Rev. 03/9-2007
5	Amendments to part I	Issue 02/Rev. 00/2-2008
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Part I Chapter Contents

CONDITIONS OF SERVICES FOR THE CLASSIFICATION & STATUTORY WORK WITH INTERNATIONAL NAVAL SURVEYS BUREAU – INSB CLASS

The conditions of services illustrated here below shall apply to the provision by the society "International Naval Surveys Bureau - Classification Society (herein-after referred to as "INTERNATIONAL NAVAL SURVEYS BUREAU - CLASSIFICATION SOCIETY" and/or INSB Class, or the society) **of its services, information or advice of whatever nature related to the Classification of ships or installations, and shall be deemed to be or treated as being applicable for all applications submitted by third parties, in this respect. For statutory work please refer to below point Nr 12.**

1. *"Classification"* process is consisted by: a) the development or update and implementation of Rules & Regulations, Guides, standards and other verified criteria, b) the review of ships design and survey (during or after construction), to verify compliance with such Rules & Regulations, Guides, standards and other verified criteria and c) the assignment of a classification character and registration into the society's Register of Ships, once such compliance has been verified. Continued compliance and/or construction supervision is conditional upon Classification determined provisions and proper care, conduct and responsibility from the side of the ship owners or operators.

2. The ship's owner, operator or his representative will proceed to make the necessary preparations for the ship to be ready to undertake the requested surveys or other services in a prompt manner. Ship owners or operators are responsible for establishing and maintaining safe working conditions in accordance with the applicable safety standards and for providing INSB Class surveyors or auditors with safe access to sites and assistance during surveys, audits, testing and trials.

3. INSB Class shall exercise due care and shall act with professionalism and workmanship. Surveyors apply normally accepted examination and testing standards to those items specified for each survey by the Rules, construction or survey procedures and safety related standards.

4. INSB Class will in its sole and absolute discretion determine the practices and procedures to be adopted for the tests, inspections and surveys to be carried out by its surveyors. The right for the selection, appointment or the replacement of an INSB Class surveyor remains only with the INSB Class.

5. Classification Services are offered in compliance with the valid INSB Class Rules and Regulations for the meaning and interpretation of which INSB Class is the sole qualified to decide upon.

6. The ship and/or installation shall be properly maintained and operated under the sole responsibility of the ship owner or manager, at all times and between the surveys periodicity, as applicable.

7. Ship's owner or operators – at their sole responsibility- must promptly report to INSB Class any incident or event which may affect the condition of the ship or its classification status, as soon as practical, after its occurrence for the necessary actions towards the maintenance of class.

8. Any Classification certification, reports, records or other documents issued pursuant to surveys carried out by the society's surveyors, reflect the condition of the ship or installation at the time of surveys. Therefore, nothing in the present conditions, or in any certificate, or report, or record issued shall be deemed to create any interest, right, claim or benefit in any insurer or other third party.

9. It is understood and agreed that the issue of Classification certificates or the performance of services shall be at the sole discretion of INSB Class and that INSB Class reserves the right to withhold or withdraw classification, certificates or services for lack of conformity with its Rules or for any other reason, whether or not such reason be deemed by the other party to be unreasonable, arbitrary or un-forceable.

10. INSB Class reserves the right to reconsider, withhold, suspend, withdraw or cancel the class of any vessel with immediate effect for non-compliance with the society's Rules or other applicable standards, for defects or damages which are not reported to INSB Class, for defects reported by its Surveyors and which have not been rectified in accordance with their recommendations or in the event of non-payment of fees which are due on account of Classification or other services. Repetitive PSC detentions of an INSB classed vessel, may also affect her classification status with the society, provided that detainable items are considered to have an effect towards ship's compliance with classification Rules and Regulations.

11. INSB Class may also deem the classification of any vessel cancelled upon the vessel's sale or transfer without prior written notice to INSB Class.

12. All work performed on behalf of Flag Administrations shall be governed by the applicable International Conventions as adopted by each Flag State, their National requirements as well as the terms and conditions of this document unless the Flag Administration specifies otherwise.

13. INSB Class acts independently in the performance of its services and neither the society nor any of its officers, directors, employees or agents shall -during the expedition of services in accordance with the conditions stipulated herein- be or considered to act as officers, directors, employees or agents of any other third party, including but not limited to a shipyard, operator, charterer or insurer.

14. All documents, drawings and information provided to the INSB Class in connection with the performance of its services are treated as confidential by the society and shall not, without the prior consent of the party providing such documents or information, be disclosed for any purpose other than that for which they are provided. Results of surveys performed by INSB Class surveyors or auditors as well as ship's records are treated in the same manner as above illustrated. The contents or copies of certificates, survey results, information or reports, may be disclosed as required by applicable legislation, court order, legal proceedings or adherence to the request of the Flag Administration or Port state control Authorities and in line with the provisions of the society's related Quality procedure.

15. In addition, it is understood and agreed that below information is considered public information and available to 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.

16. INSB uses every endeavor to ensure that all its services function with every possible attention and accuracy. Nevertheless, this society cannot be held responsible for any mistake, error or omission in any report or certificate issued by its Surveyors/Auditors. The same applies to the Register Book issued, its appendices and to every publication. Similarly, INSB Class cannot be held responsible for any negligence, omission error of judgment of its surveyors, auditors, representatives, agents or advisors. Further, neither the INSB Class nor any of its officers, directors, employees, agents, subcontractors shall be liable of any loss, damage or error of whatever nature whether or not negligent howsoever caused in the provision of services, information or advice given in any way whatsoever by or on behalf of the INSB Class. In providing services, information or advice neither the society nor any of its officers, directors, employees, agents or subcontractors warrant the accuracy of any information or advice provided.

17. In the unpleasant case where a customer of INSB Class suffers loss, damage or expense arising from the provision of the society's services, information or advice which is proved to have been caused due to the society's negligent act, error or omission or from any inaccuracy in the information or advice provided by any INSB Class officers, directors, employees, agents or subcontractors, the society shall provide compensation for any proved loss, damage or expense up to but not exceeding the amount of fee charged and collected by the INSB Class for the particular service, information or advice. Any claim for loss, damage or expense shall be made in writing to the INSB Class within three (3) months from the date when the particular service, information or advice was first provided. Failure to present any claims to the society in written and within the three (3) months period, any of such claims will be deemed as to have been waived and shall be time barred in whole.

18. INSB Class does not in any way warrant when providing services in relation to the classification, certification, registration, surveying or auditing, or maintenance of ships, installation, machinery, materials or equipment, that any computer, hardware or software or relevant electronic components, servers or programs, databases or other mass data storage, web based application, electronic information systems, microchips or other embedded electronic part, has the capacity to process changes in date and/or in time data or information without loss of performance or functionality or information accuracy. The society hereby expressly excludes any liability of whatsoever nature and caused in respect of any loss, damage or expense, whatever arising out of or in connection with the loss of performance or functionality or information accuracy.

19. Nothing contained herein or in any document, information or advice or provided in connection with or pursuant to the performance by the INSB Class of its services, shall be deemed to relieve any designer, naval architect or engineer, builder, manufacturer, shipyard, supplier, contractor or subcontractor, repairer, ship owner or operator, or any other individual or entity, from any warranty or any other contractual obligations expressed or implied or from any fault whatsoever, not to create any right, claim or benefit in any third party.

20. Any and all disputes or differences of whatsoever nature over the interpretation or enforcement of the herein conditions shall be tried by both contracted parties to be resolved extra judicially and in good faith. Should the raised disputes remain same shall be referred to arbitration in Piraeus according to the in force Greek law on arbitration. A sole Arbitrator will be appointed by the President of the Appeal Court of Piraeus (Effetio). The arbitration will be held in Greece, preferably in Piraeus, at a place and time to be determined by the Arbitrator, and will be confidential. It is hereby understood and agreed that the decision of the Arbitrator will be final, no appeal will be permitted to a National Court, irrespective of the provisions of the said law and the fact that it may permit such appeals from the decision of an Arbitrator, either on a question of law or on a question of fact. If the Arbitrator determines that any provision of the present conditions is invalid or unenforceable under the governing law, such determination shall not affect the remainder of the present conditions, the provisions of which shall remain in full force and effect.

21. Services offered by INSB Class are priced according to its current fees table. Any intervention of INSB Class whether completed or interrupted for any reason, shall be invoiced and paid upon the receipt of the invoice. Further it is hereby agreed that all fees and expenses as a result of the applied services shall be covered to the society, regardless of whether certification will be achieved or not. Interest may be demanded for late payments.

Section

Section 1 General

INSB Class rules for classification contain procedural and technical requirements related to obtaining and retaining a class certificate. The rules represent all requirements adopted by the Society as basis for classification.

1.1. I.N.S.B. profile

1.1.1 INSB Class was founded in 1977. The INSB Class Head Office is based in Piraeus, in its own premises, which facilitates all necessary activities of the society while its legal address is:

8, Kantharou & Sachtouri Street
185 37 Piraeus,
Greece

1.1.2 Each INSB Office has its own legal address given in the INSB Directory which is regularly published by INSB Class.

1.1.3 **International Naval Surveys Bureau - Classification Society,** is a Greek Non-Governmental ship's Classification Society, which was actually founded on the 1st of July 1977 under the legal form of a Societe Anonyme (S.A.), at Piraeus by naval architects and marine engineers.

1.1.4 After some years from its establishment, International Naval Surveys Bureau- I.N.S.B. was re formed to a non-profitable classification society, in accordance with the articles 3 & 31 of its constitutional document, respectively.

1.1.5 Its portfolio of services includes classification and technical assessments of ships under construction and ships in service, engineering studies as well as statutory survey and certification activities, on behalf of Flag States having authorised the society, on a worldwide scale.

1.2 Application

1.2.1 The requirements of these Rules apply to ships intended for seagoing service.

1.2.2 Ships covered by the present Rules are designed with the following service notations.
Ships when the ship is not engaged in trade
Charter ship when the ship is engaged in trade

Note: the wording "Ships" currently used in the present Rules covers both service notations, except otherwise specified.

1.2.3 The requirements of these Rules cover ships, of build in steel, aluminium, or equivalent material.

1.3 References in the Rules

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.

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

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

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

1.3.4 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.

1.3.5 **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*".

1.3.6 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.

1.4 General definitions

For the purpose of the Rules and Regulations, the following definitions will apply:

Society: INSB, carrying out Classification and Statutory Certification.

Surveyor: technical staff acting on behalf of the Society to perform tasks in relation to classification and survey duties

Survey: an intervention by the Surveyor for assignment or maintenance of class as defined in Part I, Chapter 2, or interventions by the Surveyor within the limits of the tasks delegated by the Administrations

Administration: the Government of the State whose flag the ship is entitled to fly or the State under whose authority the ship is operating in the specific case

Customer: an entity, having responsibility for the classification of the ship, such as the Owners of a ship and his representatives, or the Shipbuilder, or the Engine Builder, or the Supplier of parts to be tested

Owner: the Registered Owner or the Disponent Owner or the Manager or any other party having the responsibility to keep the ship seaworthy, having particular regard to the provisions relating to the maintenance of class laid down in Part I, Chapter 2

Class: Class is assigned to and will be retained for Vessels, which the Society has found to be in compliance with applicable requirements of the Society's Rules.

Class Certificate: A Certificate confirming compliance with the Society's Rules as applicable and at the time of Survey.

Class Notation: An abbreviation or keyword expressing a specific feature relating to a Vessel or its machinery, systems and equipment, or service area while referring to specific requirements in the

Rules for Classification: A service which comprises the development and maintenance of Rules, and to verify compliance with the Rules throughout the Vessels' life.

Recognized Classification Society: A Classification Society, which is a member of IACS, or society with which the INSB Class has an agreement for mutual recognition or representation, or other society which is approved by the flag Administration that the vessel is registered.

Alteration: A change that does not affect the basic character or structure of the Vessel it is applied to.

Builder: The party contracted to build a Ship in compliance with the Society's Rules.

Conversion: Change that substantially alters the dimensions, carrying capacity, engine power or the type of the Ship.

Certificate: A document confirming compliance with the Society's Rules or with other rules and regulations for which the Society has been authorized to act. Compliance is confirmed on the date as given in the Certificate.

Certification: A service that comprises assessment of compliance with applicable requirements and issuance of a Certificate if compliance is confirmed.

Condition of Class: A requirement that specific measures, Repairs or Surveys shall be carried out within a specific time limit in order to retain Class.

Contract for Construction: A contract between the prospective Owner and the Builder to build a Ship.

Memorandum to Owner: Information related to the Vessel, its machinery, system and equipment or applicable requirements. A Memorandum to Owner will be issued in relation to information that does not require any corrective action or Survey.

Essential service: is intended to mean a service necessary for a ship to proceed at sea, be steered or manoeuvred, or undertake activities connected with its operation, and for the safety of life, as far as class is concerned.

1.5 The Rules

1.5.1 General

1.5.1.1 The Rules published by the Society give the requirements for the assignment and the maintenance of classification for seagoing ships.

1.5.1.2 The Rules stipulate requirements for the design, construction, Survey and testing of Ships.

1.5.1.3 The Rules stipulate requirements for structures, materials, machinery, systems and equipment.

1.5.1.4 The Rules cover in some areas requirements also stipulated by IMO conventions and codes.

1.5.1.5 For issuance of statutory Certificates, compliance with the statutory instruments will prevail where the Rules and IMO conventions and codes differ.

1.5.1.6 The Rules and amendments to the Rules accepted by the Society will enter into force on a date decided by the Society.

1.5.1.7 In the case where service experience and/or theoretical findings show that unacceptable risks may exist in connection with items covered by the existing Rules, the

Society may, at any time, decide to lay down supplementary or amended requirements concerning the assignment and retention of Class.

1.5.1.8 The Rules are an integral part of the Society's Classification service. The safety objectives inherent in the Rules are only achieved in conjunction with this Classification service.

1.5.1.9 Using the Rules without the Society's corresponding Classification services may have the result that safety objectives are not met.

1.5.2 Effective date of the Rules

1.5.2.1 The classification of ships other than those dealt with in the Part I is covered by specific Rules published by the Society.

1.5.2.2 Unless otherwise specified, the Rules do not deal with structures, pressure vessels, machinery and equipment which are not permanently installed and used solely for operational activities such as dredging or heavy load lifting, workshops or welding equipment, except for their effect on the classification-related matters, as declared by the Interested Party, such as fire protection and ship's general strength.

1.5.2.3 During periods of construction, modification or repair, the unit is solely under the responsibility of the builder or the repair yard.

1.5.2.4 The effective date of entry into force of any amendments to the Rules is indicated on the inside front page of the Rules or in the relevant Section.

1.5.2.5 In principle, the applicable Rules for assignment of class to a new ship are those in force at the date of contract for construction.

1.5.2.6 Special consideration may be given to applying new or modified rule requirements which entered into force subsequent to the date of contract for construction, at the discretion of the Society and in the following cases:

- when a justified written request is received from the party applying for classification
- when the keel is not yet laid and more than one year has elapsed since the contract for construction was signed
- where it is intended to use existing previously approved plans for a new contract.

1.5.2.7 The above provisions for application of the Rules are, in principle, also applicable to existing ships in the case of major conversions and, in the case of alterations, to the altered parts of the ship.

1.5.2.8 The rule requirements related to assignment, maintenance and withdrawal of the class of ships already in operation are applicable from the date of their entry into force.

1.5.3 Equivalence

1.5.3.1 The Society may consider the acceptance of alternatives to these Rules, provided that they are deemed to be equivalent to the Rules to the satisfaction to the Society

1.5.3.2 When the Administration of the State whose flag the ship is entitled to fly has issued specific rules, the Society may accept such rules for classification purposes in lieu of those given in this Part.

1.5.3.3 If detailed requirements are not prescribed in the Rules, the Society may consider the safety and reliability level of a proposed solution, or require clarification to resolve the issue.

1.5.3.4 The Society reserves the right to accept or reject proposed solutions without justification.

1.5.4 Novel features

The Society may consider the classification of ships based on or applying novel design principles or features, to which the Rules are not directly applicable, on the basis of experiments, calculations or other supporting information provided to the Society.

1.5.5 Interpretation of the Rules

1.5.5.1 The Society reserves the exclusive right to interpret, decide equivalence or make exemptions from the Rules.

1.5.5.2 Competent interpretations of the requirements stated in the Rules, or in any other regulation published by INSB, are exclusively in jurisdiction of the Head Office, regardless of other possible interpretations of surveyors in the other offices or stations.

1.6 Classification, scope and limits

1.6.1 The classification process consists of:

- the development of Rules, guidance notes and other documents relevant to the ship, structure, material, equipment, machinery and other items covered by such documents
- the review of plans and calculations and the surveys, checks and tests intended to demonstrate that the ship meets the Rules.
- the assignment of class and issue of a Certificate of Class, where compliance with the above Rules is found

- the periodical, occasional and class renewal surveys performed to record that the ship in service meets the conditions for maintenance of class.

1.6.2 The Rules, surveys performed, reports, certificates and other documents issued by the Society, are in no way intended to replace or alleviate the duties and responsibilities of other parties such as Administrations, Designers, Shipbuilders, Manufacturers, Repairers, Suppliers, Contractors or Sub-contractors, actual or prospective Owners or Operators, Charterers, Brokers and Underwriters.

1.6.3 The activities of such parties which fall outside the scope of the classification as set out in the Rules, such as design, engineering, manufacturing, operating alternatives, choice of type and power of machinery and equipment, number and qualification of crew or operating personnel, lines of the ship, trim, hull vibrations, spare parts including their number, location and fastening arrangements, life-saving appliances, and maintenance equipment, remain therefore the responsibility of those parties, even if these matters may be given consideration for additional class notation assigned.

1.6.4 Class is assigned to a Ship on the basis of compliance with the Rules.

1.6.5 The assignment of Class is documented by the issuance of a Class Certificate and the entry of the ships' main particulars and details of Class in the Society's Register of Vessels.

1.6.6 Class is maintained during the service period provided applicable requirements are observed and Surveys carried out. The Class will be retained on the condition that the requirements applicable for retention of Class are complied with. Retention of Class is confirmed by annual endorsements and renewal of the Class Certificate at 5-year intervals.

1.7 Main Class and Class Notations

1.7.1 The Class Notations are based on the following structure:

- Main Class Notation
- Ship type notations
- Mandatory ship type notations
- Optional ship type notations
- Additional Class Notations
- Mandatory additional notations
- Optional additional notations
- Service area restriction

1.7.2 Applicable Class Notations are provided in Ch.2, Section 5, of this Part.

1.7.3 Class Notations are assigned to a Ship in order to determine applicable requirements in the Rules for assignment and/or retention of that Class Notation.

1.7.4 Optional Class Notations include requirements to safety levels and availability beyond that of Main Class and mandatory Class Notations.

1.8 Request for services

1.8.1 Requests for interventions by the Society, such as surveys during construction, surveys of ships in service, tests, etc., are in principle to be submitted in writing and signed by the Interested Party.

1.8.2 Such request implies that the applicant will abide by all the relevant requirements of the Rules, including the Terms and Conditions.

1.8.3 The Society reserves the right to refuse or withdraw the class of any ship for which any applicable requirement of the Rules is not complied with.

1.9 Classification of new constructions

1.9.1 General

1.9.1.1 The request for classification of new constructions is to be submitted to INSB Class by the shipyard or shipowner in the form provided by INSB Class.. The request is to include complete details regarding class notation and statutory certificates required, where applicable.

1.9.1.2 The INSB Class Rules in force on the date of contract for construction of the vessel will be applicable for classification, in general.

1.9.1.3 However, statutory requirements coming into force after the date of contract for construction may have to be complied with if they become applicable based on any other criteria such as the date on which ship is constructed (keel laid).

1.9.1.4 Where orders for major machinery and equipment are placed on manufacturer or suppliers, INSB Class will have to be informed. Responsibility for compliance with INSB Class Rules and Regulations shall be with the manufacturers/suppliers.

1.9.1.5 Where relevant, the date of application for certification of specific major machinery will also be considered in addition to the date of contract for construction of the vessel, for determining the applicable rules for such machinery.

1.9.1.6 Plans and particulars as specified in the Rules will have to be submitted to INSB Class in triplicate sufficiently in advance of commencement of construction. One copy with stamp of approval will be returned. Any deviation from approved drawings will require to be approved by INSB Class prior to execution of work.

1.9.1.7 INSB Class reserves the right to request for additional plans, information or particulars to be submitted.

1.9.1.8 Where it is proposed to use existing previously approved plans for a new contract, written application is to be made to INSB Class.

1.9.1.9 Approval of plans and calculations by INSB Class does not relieve the Builders of their responsibility for the design, construction and installation of the various parts, nor does it absolve the Builders from their duty of carrying out any alterations or additions to the various parts on board deemed necessary by INSB Class during construction or installation on board or trials.

19.1.10 INSB Class will assess the production facilities and procedures of the shipyard and other manufacturers as to whether they meet the requirements of the construction Rules.

19.1.11 Review of the construction facilities prior to any steel work or construction shall be carried out under the following circumstances:

a) Where INSB Class has none or no recent experience of the construction facilities – typically after a one year lapse – or when significant new infrastructure has been added.
b) Where there has been a significant management or personnel re-structuring having an impact on the ship construction process, or
c) Where the shipbuilder contracts to construct a vessel of a different type or substantially different in design.

1.9.1.12 During construction of a vessel, INSB Class will ensure by surveys that parts of hull and machinery requiring approval have been constructed in compliance with approved drawings, all required tests and trials are performed satisfactorily, workmanship is in compliance with current engineering practices and welded parts are produced by qualified welders.

1.9.1.13 All hull, machinery and electrical installations will be subjected to operational trials in the presence of INSB Class Surveyor.

1.9.1.14 On completion of the ship copies of as fitted plans showing the ship as built, essential certificates and records, loading manual etc. are to be submitted by the Builder generally prior to issuance of the Interim Certificate of Class.

1.9.1.15 For each new construction the shipbuilder is required to prepare and deliver a ship construction file containing documents / plans / manuals etc. for facilitating the future inspection of survey, repair and maintenance. Some of these documents may be directly supplied by other parties e.g. shipowner, for inclusion in the ship construction file. The ship construction file is to be maintained onboard each ship.

1.9.2 Date of contract for construction

19.2.1 The date of "contract for construction" of a ship is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the ships included in the contract are to be declared to INSB Class by the party applying for the assignment of class to a new building.

1.9.2.2 The date of "contract for construction" of a series of ships, including specified optional ships for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

1.9.2.3 For the purpose of this requirement, ships built under a single contract for construction are considered a "series of ships" if they are built to the same approved plans for classification purposes. However, ships within a series may have design alterations from the original design provided:
a) Such alterations do not affect matters related to classification, or
b) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to INSB Class for approval.

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

1.9.2.5 If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such ships is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which above apply.

1.10 Appeal from Surveyors' recommendations

If the recommendations of the Surveyors are considered in any case to be unnecessary or unreasonable, appeal may be made to INSB, who may direct a special examination to be held.

1.11 Register of ships

A Register of Ships is published periodically by the Society. This publication, which is updated by the Society, contains the names of ships which have received the Certificate of Classification, as well as particulars of the class assigned and information concerning each ship.

1.12 Port State Control (PSC)

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

1.12.2 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 ships, for identification of possible areas of deficiencies and recommendation of repairs.

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

1.13 Provisions of International Conventions and National standards

1.13.1 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.

1.13.2 In the case of a discrepancy between the provisions of the applicable international and national regulations and those of the Rules, normally, the former take precedence. However, the Society reserves the right to call for the necessary adaptation to preserve the intention of the Rules

1.14 Duties of the Customer

1.14.1 International and national regulations

1.14.1.1 The classification of a ship does not relieve the Interested Party from compliance with any requirements issued by Administrations.

1.14.1.2 Attention is drawn on the prohibition of asbestos on-board ships (new ships, modified parts of existing ships) and other National Regulations, as applicable.

1.14.2 Surveyor's intervention

1.14.2.1 Surveyors are to be given free access at all times to ships which are classed or being classed, shipyards and works, to carry out their interventions within the scope of assignment or maintenance of class, or within the scope of interventions carried out on behalf of Administrations, when so delegated.

1.14.2.2 Free access is also to be given to auditors accompanying the Surveyors of the Society within the scope of the audits as required in pursuance of the Society's internal Quality System or as required by external organizations.

1.14.2.3 Customers are to take the necessary measures for the Surveyors' inspections and testing to be carried out safely. Interested Parties - irrespective of the nature of the service provided by the Surveyors of the Society or others acting on its behalf - assume with respect to such Surveyors all the responsibility of an employer for his workforce such as to meet the provisions of applicable legislation. As a rule, the Surveyor is to be constantly accompanied during surveys by personnel of the Interested Party. Customers are to inform promptly the Surveyor of defects or problems in relation to class.

1.14.2.4 The Certificate of Classification and/or other documents issued by the Society remain the property of the Society. All certificates and documents necessary to the Surveyor's interventions are to be made available by the Customer to the Surveyor on request.

1.14.2.5 During the phases of ship design and construction, due consideration should be given to rule requirements in respect of all necessary arrangements for access to spaces and structures with a view to carrying out class surveys.

1.14.2.6 Arrangements of a special nature are to be brought to the attention of the Society.

1.14.3 Operation and maintenance of ships

1.14.3.1 The classification of a ship is based on the understanding that the ship is loaded and operated in a proper manner by competent and qualified crew or operating personnel according to the environmental, loading, operating and other criteria on which classification is based.

1.14.3.2 Ships are to be maintained at all times, at the diligence of the Owners, in proper condition complying with international safety and pollution prevention regulations.

1.14.3.3 Any document issued by the Society in relation to its interventions reflects the condition of the ship as found at the time and within the scope of the survey. It is the Customer's responsibility to ensure proper maintenance of the ship until

the next survey required by the Rules. It is the duty of the Customers to inform the Surveyor when he boards the ship of any events or circumstances affecting the class.

1.14.4 Calibration of equipment

Measuring and test equipment used by the Customers, the result of which may form the basis for the Surveyor's decisions, shall have a calibration status to an appropriate accuracy according to the Rules or as accepted by the Surveyor.

1.15 External Audits / Inspections

1.15.1 In cases of external audits or inspections of processes of the *Register*, for the certification of the *Register* and in order to verify compliance of such processes against applicable rules, regulations and quality standards, and in addition to stated in above the following parties have for access to the information:

1) Authorised representatives of the Flag State Administration;
2) Authorised audit teams (i.e. Accreditation Body).

1.15.2 For that purpose representatives / auditors may accompany Surveyors of the Register at any stage of their classification and/or statutory work, which may necessitate the representatives / auditors having free access to the ship, or to the premises of the manufacturer / shipbuilder. Shipowners, Companies, Shipyards or manufacturers shall provide representatives / auditors with the safe access to the premises / ship.

1.16 Service suppliers

1.16.1 Suppliers providing services to the Owner, for Class & Statutory services, such as measurements, tests and maintenance of safety systems and equipment, the result of which may form the basis for the Surveyor's decisions, shall be approved by the Society, according to criteria established by the Society.

1.16.2 Society may also accept the services of firms approved by other recognized classification societies.

1.16.3 For statutory services, approvals done by the flag Administration itself or duly authorized organisations acting on behalf of the flag Administration may be accepted.

1.17 Health, Safety and Environment (HSE)

1.17.1 Both INSB Class and the Customers shall employ reasonable standards for promoting safety, health and environmental protection and for ensuring safe working environments for their personnel.

1.17.2 Customer shall inform INSB Class without undue delay of:

i. any actual or potential HSE risk which Customer is aware of and which is reasonably relevant to the performance of the Work; and
ii. any of Interested Parties' implemented or planned measures against such risks that Interested Parties requires INSB's Class personnel to adhere to.

1.17.3 Whenever INSB Class's performance of the Work involves visits to or work on Interested Parties controlled facilities or sites, Customer is responsible for the adequacy, stability, safety and legal compliance of the working environment, including reasonable measures to mitigate or control relevant risks.

INSB Class or its personnel is entitled to refuse to carry out any activity, or visit any area or site, if INSB Class or its personnel in their sole discretion consider that relevant risks are unacceptable or not adequately addressed, contained or otherwise mitigated. Any such decision shall suspend both parties' obligations under the Contract without any liability or penalties until the parties have agreed on how to proceed.

1.18 Ethics

1.18.1 No INSB Class employee is permitted under any circumstances, to accept, directly or indirectly, from any person, firm or company, with whom the work of the employee brings the employee into contact, any present, bonus, entertainment or honorarium of any sort whatsoever which is of more than nominal value or which might be construed to exceed customary courtesy extended in accordance with accepted ethical business standards.

Section 2 Legal matters

2.1 Liability of INSB Class

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 INSB Class, 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 INSB Class, even if held to amount to a breach of warranty. Nevertheless, if any person who is a party to an agreement pursuant to which INSB Class provides any services, uses INSB Class services or relies on any information or advice given by or on behalf of INSB Class and suffers loss, damage or expense which is proved to have been due to any negligent act, omission or error of INSB Class, its officers, employees or agents, or any negligent inaccuracy in information or advice given by or on behalf of INSB Class, then the Society will pay compensation for his proved loss up to, but not exceeding the amount of the fee (if any) charged by INSB Class 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 INSB Class pursuant to which any certificate, statement, data or report is issued in respect of any information or advice expressly or impliedly given by INSB Class 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 INSB Class 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 INSB Class is Piraeus. At the option of INSB Class 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 organizations, 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 INSB Class

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 INSB Class or on the basis of the price quoted in the offer.

3.1.2 In addition to the aforesaid, INSB Class 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 organization or other causes attributed to the client and for which the INSB Class is not responsible will be charged separately at the respective cost rates.

Section

Section 1 Classification Principles

1.1 Classification Survey

1.1.1 Class is assigned to a ship upon a survey, with the associated operations, which is held in order to verify whether it is eligible to be classed on the basis of the Rules of the Society. This may be achieved through:

- the completion of the new building, during which a survey has been performed,
- a survey carried out when ships change class from a Recognized Society
- a specific admission to class survey, in cases where a ship is classed with a non- Recognized Society or is not classed at all.

1.1.2 Classification survey is comprising a set of surveys and activities during which the ship is surveyed during construction on the basis of design approval, tested before being taken into service, and surveyed regularly during its whole operational life, until it is laid-up or scrapped.

1.1.3 Classification covers ship's hull and machinery installations (including electrical installations). The aim of the classification survey is to verify that the required Rules standards regarding maintenance of the ship, its equipment, electrical and machinery installations are applied, with a special consideration to the navigation area and service of the ship.

1.1.4 Certain installations may be classed separately (e.g. automation installations), and therefore are subjected to classification survey also.

1.1.5 Activities and requirements concerning classification survey are stated in relevant Parts of the Rules.

1.1.6 Shipyards, manufacturers, shipowners, etc. are to provide safe access and necessary facilities for the Surveyors while performing classification survey. In addition to that, shipyards, manufacturers, shipowners, etc. are responsible for the organisation of the survey in prescribed time schedules.

1.1.7 After completing the survey during construction or alteration, or after completing any survey of materials or products, no alteration on the ship construction, machinery installation, equipment or other parts, to which the requirements of the Rules are applicable, is to be carried out without permission of the Society.

1.1.8 If certain arrangements or equipment of the ship are out of order, and consequently not being in use, and if they have no major influence on the safety of life, property at sea and protection of the sea environment, i.e. if such equipment not being required by the Rules, they are to be permanently removed from the ship. Exceptionally, the Society may not require their removal under condition that on such arrangements or equipment it is clearly posted (locally and in control room) that they are not being in use.

1. 1.1.9 The Owner is to ensure that the condition of the ship and maintenance of its equipment is such that the ship is in any case capable for navigation with no hazards for the ship, personnel, passengers and the environment, as it is stated by the Rules.

1. 1.1.10 Therefore, the Rules, classification surveys performed, reports, certificates and other documents issued by the Society, are in no way intended to replace or alleviate the duties and responsibilities of other parties such as actual or prospective owners or operators, charterers, brokers, underwriters, Flag State Administrations, Port State Controls, designers, shipbuilders, manufacturers, repair yards or suppliers.

1.1.11 Classification survey of existing ships is performed on the basis of a request submitted by the Owner or his representative.

1.1.12 While performing surveys of existing ships, i.e. during surveys of the parts or systems of the ship, the extent of the survey may be enlarged if there are reasonable doubts as to accuracy or reliability of surveyed parts or systems, as well as in the cases of additional requirements imposed by the Society.

1.1.13 The Owner, Company or the Master of the ship is to notify the Society immediately:

1) When docking a ship.

2) In cases of conversion and alternation to the hull, machinery installations and other equipment influencing the class of the ship assigned by the Society. Conversions and alternations are to be performed under the Surveyor's supervision, and are to be in accordance with the requirements of the Rules and/or additional requirements of the Society.

3) In cases when parts of the ship's structure normally difficult to access are exposed, (e.g. when any part of the main or auxiliary machinery, including boilers, insulation or wooden ceilings, etc. is removed).

4) When the ship is put out of service or when the ship is laid-up.

5) In cases of changing the name, changing the port of registry, changing the flag or selling the ship.

6) In cases when the ship sustains damage of such extent that it is presumed that ship's class is affected and that safety and integrity of the ship is endangered. In that case the ship is to be surveyed in the first port of call or according to further instructions from the Society. The survey is to be of the extent which the Society considers necessary taking into account the amount of the damage.

7) In cases when class related deficiencies and/or defects are found as a result to Flag State inspection or Port State Control. Should the Owner or Company fails to inform the Society on detention of the ship by Port State Authorities due to class related deficiencies, the Society reserves the right to suspend or withdraw Certificate of class.

1.1.14 It is the Owner's responsibility to decide whether and which spare parts will be carried on board. As spare parts are outside the scope of classification, they will not be checked during classification surveys, under presumption they are kept on board, maintained in satisfactory condition, or suitably protected and lashed. However, in the case of replacement, the spare parts used are to meet the requirements of the Rules as far as practicable.

1.2 Certificates of Class

1.2.1 Certificates of Class will be issued when the required reports on completion of Special Surveys of new ships or of existing ships submitted for classification have been received from the Surveyors and approved by the Society.

1.2.2 Certificates of class maintenance in respect of completed periodical special surveys of hull and machinery will also be issued to Owners.

1.2.3 The Surveyors are permitted to issue Interim Certificates to enable a ship, classed with INSB Class, to proceed on her voyage provided that, in their opinion, she is in a fit and efficient condition. Such Certificates will contain Surveyors' recommendations for continuance of Class, but in all cases are subject to confirmation by INSB Class.

1.2.4 Individual Certificates can also be issued for propelling machinery, boilers, equipment and fittings which have been manufactured under INSB Class Survey and in accordance with these Regulations.

Section 2 Assignment of Class

2.1 Assignment of Class - New ships

2.1.1 General

2.1.1.1 A request for Classification of a new ship shall be submitted in writing by the Customer. The Society reserves the right to decline a request for Classification.

2.1.1.2 The Society:

- approves the plans and documentation submitted as required by the Rules
- proceeds, if required, with the appraisal of the design of materials and equipment used in the construction of the ship and their inspection at works
- carries out surveys, attends tests and trials provided for in the Rules, or obtains appropriate evidence to satisfy itself that the scantlings and construction meet the rule requirements in relation to the approved drawings
- assigns the appropriate construction mark

2.1.2 Requirements for Builder or Designer

Builders or Designers shall provide the Society with evidence of their capability to successfully manage Classification projects.

2.1.3 Applicable Rules

2.1.3.1 The Rules that apply for assignment of Class to a new ship are generally those in force at the date of "contract for construction". The Society may upon special consideration and in agreement with the parties involved decide on the Rules to be applied.

2.1.3.2 For a ship in a series of identical ships under construction to the Class of, or of a design previously approved by another classification society, the Society may accept the design approved by that classification society. This is provided a review by the Society has demonstrated that the design in principle meets the Society's Rule requirements for Main Class, and mandatory Class Notations as applicable.

2.1.3.3 For a ship where the Flag Administration undertakes approval and surveys of items covered by statutory instruments which are also covered by the Rules, the Society may accept their decisions as basis for assigning Class, provided the Society's remaining requirements for Main Class and mandatory Class Notations are complied with. Necessary Documentation, such as copies of approved plans, reports and other particulars approved by the Flag Administration shall be submitted.

2.1.4 Plan Approval

2.1.4.1 The following Documentation shall be submitted:

a) Main plans:
- General arrangement
- Capacity plan
- Hydrostatic curves
- Stability

b) Hull structure plans:
- Midship section
- Longitudinal and transversal sections
- Scantling plan
- Profile and deck plan
- Watertight bulkheads
- Shell expansion/lamination schedule
- Rudder and rudder stock

c) Machinery plans:
- Machinery arrangement
- Intermediate, thrust and screw shafts
- Propeller
- Main engines, propulsion gears and clutch systems (or Manufacturer's make, model and rating information)
- Bilge and ballast piping diagram
- Wiring diagram
- Steering gear system piping and arrangements and steering gear Manufacturer's make and model information

d) Plans required for vessels assigned the additional class notations UMS :
- Instrument and alarm list
- Fire alarm system
- List of automatic safety functions (e.g. slowdowns, shutdowns, etc.)
- Function testing plan.
- Corresponding technical descriptions, calculations and data, including material specifications

For ships not previously classed with a recognized Society additional plans may be requested as follows:

a) Machinery plans:
- Engine room general arrangement
- Diagram of fuel- (transfer, service), bilge-, ballast-,lubricating oil-, cooling-, steam- and feed-, general
- service and starting compressed air piping
- Diagram of fire-fighting systems
- Drawings of boilers and air receivers
- Drawings of shaft line, reduction gear and propeller

- Drawings of steering gear

b) Electrical installation plans:
- Master plan of power distribution, lighting and emergency power circuits
- Location and arrangement of electrical equipment in hazardous areas.
- List of automatic safety functions (e.g. slowdowns, shutdowns, etc.)
- Function testing plan.

Notes:
1. Corresponding technical descriptions, calculations and data, including material specifications may be considered necessary by the Society.
2. Additional plans are to be submitted as may be considered by the Society.
3. Alternative technical data may be accepted by INSB in lieu of specific items of the listed documentation not available at the time of the transfer of class.
4. Where appropriate within reasonable limits, a proven service record of satisfactory performance during a period of adequate length may be used as a criterion of equivalence.

2.1.4.2 Where subcontractors and suppliers are involved, the Customer shall co-ordinate the submission of required Documentation, as well as co-ordinate any approval comments given by the Society.

2.1.4.3 Documentation subject to Plan Approval will be assessed by and at the discretion of the Society. The results of the assessment will be stated in a letter of approval. Comments, conditions and limitations may be stated in the letter of approval or on the plans.

2.1.4.4 The Plan Approval may be revoked at any time if subsequent information indicates that the solution was contrary to the Rules.

2.1.5 Survey during construction

2.1.5.1 When a ship is built under the supervision of the Society, the Society will verify that:

- the construction and scantlings comply with the requirements in the Rules and the approved plans, and that the required materials are used,
- the materials, components and systems have been certified in accordance with the Rules
- the work is carried out in compliance with the applicable Rules and acceptable standards
- satisfactory tests are carried out to the extent and in the manner prescribed by the Rules.

2.1.5.2 The scope of Survey is decided by the Society. The scope has been established utilising knowledge acquired from, amongst other, operational experience with risk based methods and experience feedback from internal and external sources.

2.1.5.3 The Society may increase the scope based on observed quality during construction.

2.1.5.4 The Society may base its verification methods on the Quality System as implemented in the Builder's fabrication processes and as accepted by the Society. The Surveys at the Builder's premises may consist of a combination of visual inspection, tests, measurements and review of records.

2.1.6 Functional testing

2.1.6.1 Where specified by the Rules, testing shall be carried out in the presence of a Surveyor, and related requirements for test programmes shall be observed.

2.1.6.2 A test programme for harbour and sea trials shall be prepared by the Customer and accepted by the Society. The programme shall specify systems and components to be tested, and the testing procedure. The Society may, in order to verify compliance with the Rules, request additional tests and/or data to be recorded.

2.1.6.3 The tests shall give evidence as to satisfactory operation and performance in accordance with the Rules. When testing control and safety systems, failure modes shall be simulated as realistically as possible.

2.1.7 Date of initial classification

2.1.7.1 Date of build

2.1.7.1.1 For a new building the date of build is the year and month at which the new construction survey process is completed.

2.1.7.1.2 Where there is a substantial delay between the completion of the construction survey process and the ship commencing active service, the date of commissioning may be also specified.

2.1.7.1.3 If modifications are carried out, the date of build remains assigned to the ship. Where a complete replacement or addition of a major portion of the ship is involved, the following applies:

- the date of build associated with each major portion of the ship is to be indicated on the Classification Certificate and in the Register, where it has been agreed that the newer structure shall be on a different survey cycle
- survey requirements are to be based on the date of build associated with each major portion of the ship
- survey due dates may be aligned at the discretion of the Society.

2.1.7.2 Date of initial classification for new buildings

As a general rule, for new buildings the date of initial classification coincides with the date of build.

2.1.8 Use of materials, machinery, appliances and items

2.1.8.1 As a general rule, all materials, machinery, boilers, auxiliary installations, equipment, items etc. (generally referred to as "products") which are covered by the class and used or fitted on board ships surveyed by the Society during construction are to be new and, where intended for essential services, tested by the Society.

2.1.8.2 Second hand materials, machinery, appliances and items may be used subject to the specific agreement of the Society and the Owner.

2.1.8.3 The requirements for the selection of materials to be used in the construction of the various parts of a ship, the characteristics of products to be used for such parts and the checks required for their acceptance are to be as stated in the various Parts of the Rules or as specified on approved plans.

2.2 Assignment of Class - existing Ships

2.2.1 General

2.2.1.1 A request for Class Entry of an existing ship shall be submitted in writing by the Customer. The Society reserves the right to accept or decline an application for Class Entry.

2.2.1.2 When an Owner applies to the Society for a ship already in service to be admitted to class, the application will be processed differently depending on whether the ship is:

- classed with a Recognized Society, or
- not classed with a Recognized Society.

2.2.2 Applicable Rules

2.2.1.1 Ships built under the supervision of the Society shall in general be maintained and repaired in compliance with the Rules to which it was constructed, except in cases of Conversions and Alterations, which in general comply with the Society's Rules for new Vessels in force at the time of entry into Class will be applied.

2.2.1.2 For ships built under the supervision of a classification society recognized by the Society, the Rules in force at the same date as those enforced by the other society will be applied. If such date is not known, the Society’s Rules in force at the date of “contract for construction” will be applied.

2.2.1.3 For ships other than those covered by 2.2.1.1 and 2.2.1.2, the Society's Rules for new ships in force at the time of entry into Class will be applied.

2.2.1.4 Amendments to the Rules may be made retroactive.

2.2.1.5 In cases where amendments to the Rules are made applicable to existing ships at the first annual, intermediate or renewal Survey after a specified date, or after the ship reaches a specified age, the expiry date of the related Survey time window shall determine when the amendments become effective.

2.2.3 Plan Approval

2.2.3.1 Before a ship, which has not been built under the supervision of the Society, is surveyed for assignment of Class, the information required in 2.1.4.1 shall, in general, be submitted for Plan Approval.

For a ship Classed with a recognized classification society, the submitted information may be reduced to plans showing the main scantlings and arrangements of the actual hull and machinery installations.

2.2.3.2 The extent of Plan Approval for a ship, which has not been classed, or which was previously classed with a classification society not covered by 2.2.3.1, will be specified in each case.

2.2.3.3 For a ship that has been built under the supervision of another classification society, the Society may on the basis of an overall consideration and Survey, exempt the ship from re-approval of the Plans.

2.2.4 Class entry Survey

2.2.4.1 Ships classed with a Recognized Society

Surveys to be carried out are based on the age of the ship and the updated current class status as provided by the previous Society. The extent of these surveys is to be at least the following.

2.2.4.1.1 **Hull survey** should:

- for Ships of age less than **5 years** the survey is to have the scope of an **annual survey**;
- for Ships of age between **5 and 10 years** the survey is to have the scope of an **intermediate** survey
- for Ships between **10 and 20** years of age, **in addition**, the survey is to include the inspection of a representative number of internal compartment, the inspection of the chain locker (cleared and cleaned) and thickness measurements, if considered necessary by the Surveyor. The interior of the ship shall be sufficiently opened out by the removal of lining, ceiling, cabin sole at the discretion of the Surveyor who shall be satisfied of the condition of the structure. In the context of applying this case, if a bottom survey in dry condition of the vessel is not due at the time of transfer, consideration can be given to carrying out an underwater examination in lieu of the bottom survey in dry condition;
- for all ships which are **20 years of age and above a full class renewal survey**, together with a dry bottom survey, is to be carried out. In exceptional cases consideration can be given to carrying out an underwater examination in lieu of the bottom survey in dry condition;

2.2.4.1.2 **Machinery survey**

A **general examination** of all essential machinery is to be held including at least the following:

- Insulation resistance, generator circuit breakers, preference tripping relays and generator prime mover governors are to be tested and paralleling and load sharing to be proved;
- Navigating lights and indicators are to be examined and their working and alternative sources of power verified;
- Bilge pumps, emergency fire pumps and remote controls for fuel oil valves, fuel oil pumps, lubricating oil pumps and forced draught fans are to be examined under working condition;
- The main and all auxiliary machinery necessary for operation of the vessel at sea together with essential controls and steering gear is to be tested under working conditions. Alternative means of steering are to be tested;
- A short sea trial is to be held, at the Surveyor's discretion, if the ship has been laid up for a long period;
- Initial start arrangements are to be verified

Note: In case main engines are subject to a planned overhauling scheme in accordance with the engine's manufacturer, the record book with all the works carried out shall be checked by the Surveyor in order to verify compliance with the Manufacturer's Instructions.

2.2.4.1.3 Before assigning Class, the Flag Administration will be notified about the Class Entry in order the Flag Administration to revert with any comments or instructions.

2.2.4.2 Ships never previously classed with a recognized Society

In principle, the following surveys are required, (in addition to a preliminary survey to evaluate the condition of the vessel):

- any modifications or re-enforcements required by the Classification Division further to the
- review of drawings,
- surveys to verify conformity with submitted drawings,
- class renewal survey of hull including ultra-sonic gaugings,
- class renewal survey of machinery and electrical installations,
- bottom survey in drydock,
- propeller shaft complete survey,
- boiler internal and external surveys,
- class renewal surveys of additional Class notations,

2.2.5 Date of initial classification for existing ships

In principle, for existing ships the date of initial classification is the date of completion of the admission to class survey.

2.3. The Class Certificate

2.3.1 General

2.3.1.1 The Society will issue an interim Class Certificate or a full term Class Certificate. The full term Certificate will be issued when the Society is satisfied that the requirements corresponding to the Class in question have been met.

2.3.1.2 Class may be assigned with Conditions of Class.

2.3.1.3 The Class Certificate is valid provided conditions for maintenance of Class are complied with.

2.3.1.4 Upon request, statement confirming compliance with the Rules may be issued for hull, machinery or specific Class Notations provided the Society's Class has been assigned.

2.3.1.5 An "Appendix to the Class Certificate" will be issued stating assumptions for the assignment of Class and restrictions regarding the use of the Vessel which were established or assumed at the time of assignment of Class.

2.3.1.6 In case of Classification of an existing Vessel not built under the supervision of the Society, or Classification of an existing Vessel previously Classed by the Society, the Society will issue an interim Class Certificate or a full term Class Certificate. The full term Certificate will be issued when the Society is satisfied that the requirements corresponding to the Class in question have been met.

2.3.2 Late commissioning

2.3.2.1 If the Vessel is not immediately commissioned upon delivery, but is laid up for a period, the Vessel may be accepted for entry into service upon application by the Owner. The Vessel may be subject to a condition Survey before entering into service.

2.3.2.2 The extent and scope of Survey will depend on the time period laid up and conservation measures taken.

2.3.2.3 A Survey in dry dock may be required.

2.3.2.4 Provided the hull, machinery, systems and equipment are found in all respects free from deterioration, subsequent periodical Surveys will date from the time of the condition Survey.

Section 3 Maintenance of Class

3.1 General

3.1.1 Conditions for Maintenance of Class

3.1.1.1 The ship shall be adequately manned, and the hull, machinery, systems and equipment shall be competently handled at all times.

3.1.1.2 Operation of the ship shall comply with the assumptions and conditions stated in the "Appendix to the Class Certificate" and in applicable operating manuals.

3.1.1.3 The ship, its hull structure, machinery, systems and equipment shall be maintained at a standard complying with the requirements of the Rules.

3.1.1.4 Installed machinery, systems and equipment carried on board in excess of the minimum required for Main Class and mandatory Class Notations shall either be maintained to applicable standards, or be removed or disconnected in such a way as to ensure that the installed machinery, system or equipment cannot be used.

3.1.1.5 The statutory Certificates required by applicable international conventions and/or national legislation shall be valid at all times and shall be issued by the Society, the Flag Administration itself, or by a third party approved by the Flag Administration.

3.1.2 The Customer's obligations

3.1.2.1 In order to retain a ship's Class with the Society, the Customer shall:

- at all times, ensure that the ship is maintained to the Rule standard
- submit complete and correct information related to the ship and its use, which is of significance to the Society for its assessment of the condition of the ship in relation to the Rules
- ensure that the ship is competently handled
- subject the Vessel to unscheduled Surveys when deemed necessary by the Society
- rectify Deficiencies and carry out any Conditions of Class or Retroactive Requirement specified by the Society
- subject the ship to Surveys as required by the Rules, and provide the necessary facilities for safe execution of Surveys
- submit complete and correct information on the ownership and management of the ship, addresses and corresponding administrative information pertinent to the Register of ships,
- submit correct information on the registration of the ship
- keep on board and ashore a set of as-built drawings/Documentation including subsequent Alterations/ Conversions
- pay all fees and expenses due to the Society. The Owner has, together with managers, charterers and operators, a joint and several liability for any such fees and expenses. If a request for services is made by any other party than the Owner, that party will, in addition to the Owner, be responsible for the payment of the relevant fees
- notify the Society when the ship is laid up or otherwise taken out of service for a period of more than 3 months.

3.1.2.2 The Customer should notify the Society before any dry docking of the ship, in addition to the dry docking in connection with the bottom Surveys as stipulated by the Rules.

3.1.2.3 If the hull structure, machinery, systems or equipment covered by Classification sustain damage to such an extent that it may be presumed to lead to a Condition of Class, the Society shall immediately be informed. The ship shall be surveyed in the first port of call or according to instructions from the Society.

The Survey shall be of an extent considered necessary by the attending Surveyor for ascertaining the extent of the damage.

3.1.2.4 If inspections by port or Flag Administration reveal deficiencies related to Certificates issued by INSB, the Customer shall immediately notify the Society. In case of detention, the Society shall be contacted for immediate attendance.

3.1.3 Preparations and conditions for surveys

3.1.3.1 The Owner is to provide the necessary facilities for the safe execution of the surveys.

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

3.1.3.3 In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces are to be cleaned including removal from surfaces of all loose accumulated corrosion scale. Spaces are to be sufficiently clean and free from water, scale, dirt, oil residues, etc. to reveal

corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating. However, those areas of structure whose renewal has already been decided by the Owner need only be cleaned and descaled to the extent necessary to determine the limits of the areas to be renewed.

3.1.3.4 Sufficient illumination is to be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration as well as condition of the coating.

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

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

3.1.3.7 A communication system is to be arranged between the survey party in the tank or space being examined, the responsible officer on deck and, as the case may be, the navigation bridge. The communication arrangements are to be maintained throughout the survey. This system is also to include the personnel in charge of ballast pump handling if boats or rafts are used.

3.1.3.8 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.

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

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

3.1.3.11 When examination of associated structure is required, the following applies:

- floors in the engine room are to be lifted to the necessary extent for examination of the structure
- protective sheathing is to be removed when there is any doubt as to the condition of the plating underneath or when adherence to plating is not tight
- in the case of solid ballast spaces, the solid ballast is to be partially removed for examination of the condition of the structure in way. Should doubts arise, the Surveyor may require more extensive removal of the solid ballast

3.1.4 Equipment and tools

3.1.4.1 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.

3.1.4.2 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.

3.1.5 Procedures for thickness measurements

3.1.5.1 When required as per the scope of surveys defined below, thickness measurements are normally to be carried out under the responsibility of the Owner, and in the presence of the Surveyor, by a service supplier independent from the Owner.

3.1.5.2 For all ships, the following applies:

- thickness measurements required in the context of surveys of hull structure is to be witnessed by a Surveyor.

  This requires the Surveyor to be on board while the gaugings are taken, enabling him at any time to intervene and to control the process.

- prior to commencement of the intermediate or class renewal survey, a meeting is to be held between the attending Surveyor(s), the master of the ship or an appropriately qualified representative appointed by the master or Company, the Owner's representative(s) in attendance and the thickness measurement firm's representative(s) so as to ensure the safe and efficient execution of the surveys and thickness measurements to be carried out onboard.

3.1.5.3 Thickness measurement of steel or aluminium structures is normally to be carried out by means of ultrasonic

test equipment. The accuracy of the equipment is to be proven to the Surveyor as required. The thickness measurements are to be carried out by a company authorised by the Society. The Society reserves the right to limit the scope of authorization of the Company.

3.1.5.4 A thickness measurement report is to be prepared. The report is to give the location of measurements, the thickness measured and the corresponding original thickness. Furthermore, the report is to include the date when the measurements were carried out, the type of measuring equipment, the names and the qualification of the operators and their signatures. The Surveyor is to review the final thickness measurement report and countersign the cover page.

3.1.5.5 For acceptance criteria applicable to structural corrosion diminution levels, reference is to be made to Chapter 3.

3.2 Applicable Rules

3.2.1 Ships built under the supervision of the Society shall in general be maintained and Repaired in compliance with the Rules to which it was constructed, except in cases of conversions/alterations where the Society's Rules for new Vessels will be applied.

3.2.2 For Ships built under the supervision of a classification society recognized by the Society, the Rules in force at the same date as those enforced by the other society will be applied. If such date is not known, the Society's Rules in force at the date of "contract for construction" will be applied.

3.2.3 For Ships other than those covered by 3.2.1 and 3.2.2 the Society's Rules for new Vessels in force at the time of entry into Class will be applied.

3.2.4 Amendments to the Rules may be made retroactive.

3.2.5 In cases where amendments to the Rules are made applicable to existing ships at the first annual, intermediate or renewal Survey after a specified date, or after the ship reaches a specified age, the expiry date of the related Survey time window shall determine when the amendments become effective.

3.3 Frequency of Periodical Surveys

3.3.1 Annual Survey

Annual Survey shall be held within 3 months, before and after each anniversary of the assignment of class or the class renewal.

3.3.2 Intermediate Survey

The Intermediate Survey shall be held at either the second or third Annual Survey. Parts of the Intermediate Survey, which are additional to the requirements of the Annual Survey, may be surveyed either at or between the second and third Annual Survey.

3.3.3 Class Renewal Survey

3.3.3.1 The Class Renewal Survey shall be held at 5-yearly intervals. In exceptional circumstances, may be granted an extension not exceeding 3 months to allow for completion of the Class Renewal Survey, provided that the ship has been attended for commencement of the Class Renewal Survey and the attending Surveyor(s) so recommend(s) after the following has been performed:

- annual survey,
- re-examination of the issued Recommendations,
- progression of the Class Renewal Survey, as far as practicable.

Where dry-docking is due prior to the end of the class extension, an underwater examination shall be performed by an approved diver. An underwater examination by an approved diver may be dispensed with in the case of extension of dry-docking survey not exceeding 36 months interval, provided the ship is without outstanding Recommendations regarding underwater parts.

3.3.3.2 Where the Class Renewal Survey is completed within 3 months before and after the expiry date of class validity, the validity of the new Certificate of Class will be not longer than 5 years from the expiry date of the previous Certificate. For surveys completed more than 3 months before the expiry date of class validity, the period of class will start from the survey completion date. Where the ship has been laid up or has been out of service for a considerable period because of a major repair or modification and the Owner elects to only perform the overdue surveys, the next period of class will start class renewal survey. If the Owner elects to perform the next due class renewal survey, the period of class will start from the survey completion date.

3.3.3.3 The Class Renewal Survey may be commenced at the fourth Annual Survey and be progressed so as to be completed by the fifth anniversary date. When the Class Renewal Survey started before the fourth Annual Survey, the entire survey shall be completed within 15 months. The new period of class will start from the survey completion date.

3.3.4 Tailshaft survey

3.3.4.1 Shafts with keyed propeller attachments and fitted with continuous liners or approved oil glands, or made of approved corrosion resistant materials, are to be surveyed at intervals of five years when the keyway complies fully with the present Rules.

3.3.4.2 Shafts having keyless-type propeller attachments are to be surveyed at intervals of five years, provided they are fitted with approved oil glands or are made of approved corrosion resistant materials.

3.3.4.3 Shafts having solid coupling flanges at the after end are to be surveyed at intervals of five years, provided they are fitted with approved oil glands or are made of approved corrosion resistant materials.

3.3.4.4 All other shafts not covered by above para 3.3.4.1 to 3.3.4.3 are to be surveyed at intervals of $2^{1/2}$ years with an admissible time window of 6 months.

3.3.4.5 Controllable pitch propellers for main propulsion purposes are to be surveyed at the same intervals as the screwshaft.

3.3.4.6 Directional propeller and podded propulsion units for main propulsion purposes are to be surveyed at intervals not exceeding five years.

3.3.4.7 Water jet units for main propulsion purposes are to be surveyed at intervals not exceeding five years, provided the impeller shafts are made of approved corrosion resistant material or have approved equivalent arrangements.

3.3.4.8 Dynamic positioning and/or thruster-assisted mooring and athwartship thrust propellers and shaftings are to be surveyed at intervals not exceeding five years.

3.3.5 Boiler survey

3.3.5.1 All boilers, economizers, steam receivers, steam heated steam generators, thermal oil and hot water units intended for essential services, together with boilers used exclusively for non-essential services having a working pressure exceeding 3,5 bar and a heating surface exceeding 4,5 m2 are to be surveyed internally. There is to be a minimum of two internal examinations during each five-year Special Survey cycle. The interval between any two such examinations is not to exceed 36 months. A general external examination is to be carried out at the time of the Annual Survey.

3.3.5.2 Consideration may be given in exceptional circumstances to an extension of the internal examination of the boiler not exceeding three months beyond the due date. The extension may be granted after the following is satisfactorily carried out:

a) External examination of the boiler.

b) Examination and operational test of the boiler safety valve relieving gear (easing gear).

c) Operational tests of the boiler protective devices.

d) Review of the following records since the previous boiler survey:

- Operation
- Maintenance
- Repair history
- Feedwater chemistry.

In this context 'exceptional circumstances' means unavailability of repair facilities, essential materials, equipment or spare parts, or delays incurred by action taken to avoid severe weather conditions.

3.3.5.3 An external survey of boilers including tests of safety and protective devices, and tests of safety valves using their relieving gear, is to be carried out annually within the range dates of the Annual Survey of the ship. For exhaust gas heated economizers, the safety valves are to be tested by the Chief Engineer at sea within the range dates of the Annual Survey. This test is to be recorded in the log book and reviewed by the attending Surveyor prior to crediting the Annual Survey.

3.3.6 Bottom survey

3.3.6.1 Bottom survey means the examination of the outside of the ship’s bottom and related items. This examination may be carried out with the ship either in dry dock (or on a slipway) or afloat: in the former case the survey will be referred to as dry-docking survey, while in the latter case as in-water survey.

3.3.6.2 The Owner is to notify the Society whenever the outside of the ship’s bottom and related items can be examined in dry dock or on a slipway.

3.3.6.3 There is to be a minimum of two examinations of the outside of the ship’s bottom and related items during each five year class renewal survey period. One such examination is to be carried out in conjunction with the class renewal survey.

In all cases the interval between any two such examinations is not to exceed 36 months. An extension of examination of the ship's bottom of three months beyond the due date may be granted in exceptional circumstances.

Exceptional circumstances: Exceptional circumstances' means unavailability of drydocking facilities; unavailability of repair facilities; unavailability of essential materials, equipment or

spare parts; or delays incurred by action taken to avoid severe weather conditions.

Note: Attention is drawn to the relevant requirements concerning application of national and international regulations.

3.3.6.4 Examinations of the outside of ship's bottom and related items of ships are normally to be carried out with the ship in drydock. However, consideration may be given to alternate examination while the ship is afloat as an In-water Survey. Special consideration is to be given to ships of 15 years or over before being permitted to have such examinations. For ESP ships of 15 years of age and over, such examinations are to be carried out with the ship in drydock.

3.3.6.5 The interval between examinations of the outside of the ship's bottom and related items for ships operating in fresh water and for certain harbour or non-self-propelled ship may be greater than that given above, as approved by the Society.

For ships of unusual characteristics or engaged on special services, means of underwater inspection equivalent to the bottom survey in dry condition may be considered as an alternative by the Society, particularly when a suitable high resistance paint is applied to the underwater portion of the hull or an approved system of impressed current for external cathodic protection is fitted.

3.3.6.6 Compliance with the present requirements does not absolve the Owner from compliance with the requirements of the flag Administration, especially when shorter intervals between examinations of the ship's bottom are required.

3.3.7 Continuous Survey programme

3.3.7.1 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.

3.3.7.2 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.

3.3.7.3 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.

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

3.3.7.5 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.

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

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

3.3.7.8 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.

3.3.7.9 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.

3.3.7.10 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

3.3.7.11 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.

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

3.3.8 Testing of steam pipes

3.3.8.1 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

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

3.3.9 Testing of pressure vessels

3.3.9.1 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.

3.3.9.2 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.

3.3.9.3 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.

3.3.9.4 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.

3.3.9.5 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.

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

3.4. Occasional surveys

3.4.1 General

3.4.1.1 An occasional survey is any survey which is not a periodical survey. The survey may be defined as an occasional survey of hull, machinery, boilers, refrigerating plants, etc., depending on the part of the ship concerned.
Where defects are found, the Surveyor may extend the scope of the survey as deemed necessary.

3.4.1.2 Occasional surveys are carried out at the time of, for example:

- updating of classification documents (e.g. change of the Owner, name of the ship, flag)
- damage or suspected damage
- repair or renewal work
- Port State Control inspections
- alterations or conversion
- postponement of surveys or recommendations.

3.4.2 Damage and repair surveys

3.4.2.1 Repairs shall in general be carried out in such a way that the original design and scantlings are restored. Possible design modifications or reduced scantlings based on current Rules which are less stringent than those originally enforced, shall be approved by the Society before the Repairs are carried out.

3.4.2.2 In the event of damage which affects or may affect the class of the ship, the Owner is to apply to the Society for a survey. Such application is to be made as soon as possible to enable the Surveyor to ascertain the extent of the damage and necessary repairs, if any.

Note: Whenever a ship is fitted with an helicopter platform which is made in aluminium or other low melting metal construction which is not made equivalent to steel, and a fire occurred on the said platform or in close proximity, the platform is to be subject to a structural survey to determine its suitability for further use.

3.4.2.3 If, after sustaining damage, the ship calls at a port where the Society is not represented, the Owner is to notify the Society forthwith, supply all available information regarding the damage and make arrangements for the ship to be surveyed in the nearest port where the Society is represented.

3.4.2.4 All repairs to hull, machinery and equipment which may be required in order for a ship to retain its class are to be to the satisfaction of the Surveyor.
During repairs or maintenance work, the Owner is to arrange so that any damage, defects or non-compliance with the rule requirements are reported to the Surveyor during his survey.

3.4.2.5 Damages and partial or temporary repairs considered acceptable by the Surveyor for a limited period of time are the subject of an appropriate recommendation.

3.4.2.6 Damages or repairs required by the Surveyor to be re-examined after a certain period of time are the subject of an appropriate recommendation.

3.4.3 Port State Control survey

3.4.3.1 An occasional survey is to be requested by the Owner wherever deficiencies are found as a result of a Port State Control detention.

3.4.4 Conversions, alterations and repairs

3.4.4.1 If the hull structure, machinery, systems or equipment shall be converted or altered, the changes shall be documented and be approved in the same manner as for new Vessels.

3.4.4.2 Conversion or Alterations shall take place under the supervision of a Surveyor.

3.4.4.3 Alterations of Vessels, except for assignment of new Class Notations, shall in general comply with the Rules applied during New building. Upon request, the current Rules may be applied. Conversion of a Vessel shall in general comply with the current Rules. Current Rules will in general be applied when assigning a new Class Notation to a Vessel.
3.4.4.4 Materials and equipment used for conversions, alterations or repairs are generally to meet the requirements of the Rules for new ships built under survey.

3.4.4 Conversions, alterations and repairs

3.4.4.1 Conversions, alterations or repairs of/to structures and arrangements affecting the class are to be carried out in accordance with the requirements of the Society and to its satisfaction. Where necessary, documentation is to be submitted to the Society and/or made available to the attending Surveyor.

3.4.4.2 Materials and equipment used for conversions, alterations or repairs are generally to meet the requirements of the Rules for new ships built under survey; see Ch 2, Sec 2, para 2.1.8.

3.4.5 Change of ownership

3.4.5.1 In the case of change of ownership, the ship retains its current class with the Society provided that:

- the Society is informed of the change sufficiently in advance to carry out any specific survey required by the owner in view of the sale; and
- the new Owner signs the appropriate request, involving acceptance of the Society's general conditions and Rules. This request covers inter alia the condition of the ship when changing ownership.

Note 1: The ship's class is maintained without prejudice to those provisions in the Rules which are to be enforced in cases likely to cause suspension or withdrawal of the class such as particular damages or repairs to the ship of which the Society has not been advised by the former or, as the case may be, new Owner.

Note 2: No information whatsoever related to the class of the ship will be provided or confirmed to any third party, unless the appropriate request for information is duly completed and signed by the party making the request and the authorisation of the current Owner is obtained.

3.4.6 Lay-up and re-commissioning - General principles

3.4.6.1 A ship put out of commission may be subject to specific requirements for maintenance of class, as specified below, provided that the Owner notifies the Society of the fact. If the Owner does not notify the Society of the laying-up of the ship or does not implement the lay-up maintenance program, the ship's class may be suspended and/or withdrawn when the due surveys are not carried out by their limit dates in accordance with the applicable requirements given in Ch 3.

3.4.6.2 The lay-up maintenance program provides for a "laying- up survey" to be performed at the beginning of lay-up and subsequent "annual lay-up condition surveys" to be performed in lieu of the normal annual surveys which are no longer required to be carried out as long as the ship remains laid-up. The minimum content of the lay-up maintenance program as well as the scope of these surveys are given in Ch 3 . The other periodical surveys which become overdue during the lay-up period may be postponed until the re-commissioning of the ship.

3.4.6.3 Where the ship has an approved lay-up maintenance program and its period of class expires, the period of class is extended until it is re-commissioned, subject to the satisfactory completion of the annual lay-up condition surveys as described in para 3.4.6.2.
3.4.6.4 The periodical surveys carried out during the lay-up period may be credited, either wholly or in part, at the discretion of the Society, having particular regard to their

extent and dates. These surveys will be taken into account for the determination of the extent of surveys required for the re-commissioning of the ship and/or the expiry dates of the next periodical surveys of the same type.

3.4.6.5 When a ship is re-commissioned, the Owner is to notify the Society and make provisions for the ship to be submitted to the following surveys:

- an occasional survey prior to re-commissioning, the scope of which depends on the duration of the lay-up period
- all periodical surveys which have been postponed in accordance with para 3.4.6.2, taking into account the provisions of para 3.4.6.4.

3.4.6.6 Where the previous period of class expired before the re-commissioning and was extended as stated in para 3.4.6.3, in addition to the provisions of 3.4.6.5 a complete class renewal survey is to be carried out prior to re-commissioning. Those items which have been surveyed in compliance with the class renewal survey requirements during the 15 months preceding the re-commissioning may be credited. A new period of class is assigned from the completion of this class renewal survey.

3.4.6.7 The scope of the laying-up survey and annual lay-up condition surveys are described in detail in Chapter 3.

3.5 Class Conditions and Memoranda

3.5.1 A Condition of Class will be imposed for, but not limited to the following:

- Repairs and/or renewals related to damage, defect or breakdown that are considered by the Society to be sufficiently serious to affect the assigned Class (e.g. grounding, structural damages, machinery damages, wastage over the allowable limits etc.)
- supplementary Survey requirements
- temporary repairs.

3.5.2 The Society will issue a Condition of Class when deemed necessary to carry out assessments in order to ascertain whether damage, a defect or a deficiency affecting the assigned Class has been sustained or is imminent.

3.5.3 A Condition of Class may contain the following:

- a description of the deficiency, defect, damage or the assessment required
- required action
- due date for the required action to be completed
- possible temporary requirements imposed until the required action has been completed.

Alternatively the Condition of Class may refer to a Survey statement for above details.

3.5.4 If a Condition of Class is considered by the Society to seriously affect the Vessel's safety and Reliability, immediate action will be required. Otherwise a time limit will be given for the action to be completed.

3.5.5 A Condition of Class will be deleted when the Society, through a Survey or received information, is satisfied that requested action has been satisfactory completed.

3.5.6 When the Society has been authorised to carry out a statutory Survey and identify a finding that exclusively relates to a statutory Certificate, a Condition on behalf of the Flag Administration will be imposed for specific measures, Repairs or Surveys that shall be carried out within a specific time limit in order to retain the statutory Certificate.

3.5.7 For information related to the Vessel, its machinery systems, and equipment or to requirements in the Rules, the Society may issue a Memorandum to Owner. A Memorandum to Owner may supplement information given otherwise, e.g. in the Appendix to the Class Certificate.

3.5.8 A Memorandum to Owner may be used in, but not limited to, the following cases:

- exemptions from requirements in the Rules
- accepted deviations from applicable requirements
- limitations on the use of the Vessel or its equipment
- defects or deficiencies of no concern to Class
- deleted Class Notations
- equipment in excess of Class requirements disused
- information related to agreed Survey arrangements.

3.5.9 Outstanding findings will be given in writing at completion of Surveys and may be recorded as Condition of Class. Findings may also be communicated verbally during the course of Surveys. Findings that have been corrected before the Survey has been completed will not be recorded as Condition of Class.

3.5.10 The Society may at any time modify a Condition of Class or Memorandum to Owner if considered appropriate. The Owner will be notified accordingly.

3.5.11 Condition of Class or Memorandum to Owner are recorded in the Vessel's Class status from where they will be deleted when no longer valid. The Owner will be notified accordingly.

3.5.12 The Owner will be informed of Retroactive Requirements.

3.6 Survey statement and Survey status

3.6.1 The Surveyor will provide a statement to the Customer on Surveys carried out.

3.6.2 Survey statements may contain the following information, to the extent applicable in each case:

- types of Surveys carried out
- Certificates issued, endorsed or extended
- damage, defects and/or deficiencies observed
- confirmation that Repairs have been completed and accepted by the Surveyor
- Conditions issued or deleted
- Memorandum to Owner issued or deleted
- Retroactive Requirements issued or deleted.

3.6.3 The Society will make Class status reports available to Customers.

3.6.4 Any document issued by the Society in relation to Surveys performed reflects the condition of the Vessel at the time of the Survey only.

3.7 Endorsement and renewal of the Class Certificate

3.7.1 Endorsement of the Class Certificate

3.7.1.1 The Class Certificate will be endorsed upon satisfactory completion of annual and intermediate Surveys for Main Class and Class Notations, as applicable. The Certificate will be endorsed for satisfactory completion of renewal Survey if there is a delay in issuance of the new Certificate.

The Class Certificate will not be endorsed unless the following has been dealt with and accepted by the Society:

- overdue periodical Class Surveys
- overdue continuous Survey items
- overdue Conditions of Class
- the completion date of the renewal Survey when the renewal Survey has been commenced more than 15 months before the expiry date of the existing Certificate

3.7.2.3 In cases where postponement of a renewal Survey has been granted, the new Class Certificate will be valid to a date

- overdue Retroactive Requirement.

3.7.1.2 If the Class Certificate is endorsed at completion of renewal Surveys, the Surveyor may extend its validity as necessary, but not more than to a date 5 months after the completion date, or after the expiry date of the Class Certificate, whichever comes first. If the Class Certificate has expired at the time of renewal Survey completion, new Certificate should be issued.

3.7.1.3 In the case where postponement of the renewal Survey has been granted upon the Customer's written request, the Surveyor will endorse the Class Certificate and extend its validity, but not more than 3 months beyond the expiry date of the Class Certificate.

3.7.1.4 In the case where the annual Class Survey is commenced prior to the defined time window, the Survey must be completed not more than 6 months after the date of commencement. In such cases the Certificate will be endorsed for advancement of anniversary date (due date) for the subsequent annual Surveys.

Expiry date of the Class Certificate may remain unchanged, but additional Surveys may be required so that the prescribed Survey intervals are not exceeded.

3.7.2 Renewal of the Class Certificate

3.7.2.1 A new Class Certificate will replace the existing Class Certificate when renewal Survey has been satisfactory completed and the Society is satisfied that the requirements for retention of Class have been met.

3.7.2.2 The new Class Certificate will be valid to a date not exceeding 5 years from:

- the expiry date of the existing Certificate when the renewal Survey has been completed within 3 months before the expiry date of the existing Certificate, or
- the expiry date of the existing Certificate when the renewal Survey has been completed after the expiry date of the existing Certificate, or
- the completion date of the renewal Survey when the renewal Survey has been completed more than 3 months before the expiry date of the existing Certificate, or

not exceeding 5 years from the expiry date of the existing Certificate before the extension was granted.

3.7.2.4 In cases where the renewal Survey is carried out concurrently with a Conversion or when the renewal Survey has been completed following Vessel being laid up or being out of service for a considerable period due to a major Repair or

modification, the validity of the new Certificate will be 5 years from the date of completion of the renewal Survey. In such cases, the scope of the renewal survey shall be increased to the extent of the next renewal Survey.

3.7.2.5 For certain ships the Certificate validity and Survey intervals may be reduced by the Society, e.g. for Vessels with new or novel design or for systems or items exposed to abnormal rates of wear or failure. Such conditions will be stated in the "Appendix to the Class Certificate" and in Memorandum to Owner.

Section 4 Suspension and withdrawal of Class

4.1 General

4.1.1 Class may be withdrawn at any time if the Society finds it justified.

4.1.2 The Society may suspend or withdraw a Vessel's Class where the conditions for retention of Class, have been violated.

4.1.3 The decision to suspend or withdraw a Vessel's Class is made by the Society. However, in cases of automatic suspension (see [4.2.1] and [4.2.2]) no individual evaluation is made. Suspension or withdrawal of Class may take effect immediately or after a specified period of time. In special cases, the suspension or withdrawal of Class may be made with retroactive effect (see [4.2.5]).

4.1.4 If the violation only affects requirements related to optional Class Notations, the suspension or withdrawal may be limited to these Class Notations only.

4.1.5 When Class is suspended or withdrawn the Society will:

- inform the Owner
- inform the Flag Administration
- make an entry to this effect in the Society's "Register of Vessels"
- make the information publicly available.

In the cases of Class suspension, a time limit will be given for when the Class will be withdrawn. This time limit will in general not exceed 6 months. A longer suspension period may be granted when the Vessel is not trading as in cases of lay-up, awaiting disposition in case of a casualty or attendance for reinstatement.

4.2 Suspension of Class

4.2.1 The Class will automatically be suspended with immediate effect if the renewal Surveys for hull, machinery, systems and equipment related to Main Class and/or mandatory Class Notations are not completed before the expiry date of the Class Certificate, and no postponement has been granted or unless the Vessel is under attendance for completion of the Survey.

4.2.2 If the annual or intermediate Surveys for Main Class and/or mandatory Class Notations are not completed within 3 months from the anniversary date of the Class Certificate, the Class is automatically suspended with immediate effect, unless the Vessel is under attendance for completion of the Survey.

4.2.3 The Society may decide to suspend a Vessel's Class if the Vessel is deemed to be unable to continue safe and reliable operation, e.g. as a result of a major casualty.

4.2.4 If any outstanding debt owed to the Society is not paid within a notified date, the Society may suspend the Vessel's Class with immediate effect.

4.2.5 In addition to the conditions laid down above, a Vessel's Class may be suspended with immediate effect in cases where:

- rectification of Deficiencies has not been carried out or otherwise dealt with in an appropriate manner, or
- rectification of Deficiencies has not been surveyed and accepted by the Surveyor,
- the Rules or other requirements imposed by the Society have been violated.

4.3 Reinstatement following Class suspension

4.3.1 If the overdue Surveys leading to Class suspension as given in 4.2.1, 4.2.2 and 4.2.3 or requirement as given in 4.2.4 are carried out within the specified time, the Class will be reinstated provided the following is met:

a) The result of the Survey is such that all observed Deficiencies are satisfactorily rectified. The Society may after consideration accept that minor Deficiencies are pending to be carried out.

b) No overdue periodical Surveys or overdue Conditions of Class at that time.

4.3.2 The Society reserves the right to decline an application for reinstatement of Class.

4.3.3 If the Class has been suspended due to outstanding debt, the Class will automatically be reinstated when all outstanding debt has been paid, provided that there are no other reasons for suspension as outlined in 4.2.

4.3.4 When the Class is reinstated, the Society will:

- inform the Owner
- inform the Flag Administration
- make an entry to this effect in the Society's "Register of Vessels"
- make the information publicly available.

4.4 Withdrawal of Class

4.4.1 The Owner can request a withdrawal of Class at any time.

4.4.2 If the overdue Surveys specified in 4.2.1, 4.2.2 and 4.2.3 or requirement as given in 4.2.4 are not carried out within the specified time after the Class suspension, the Society will withdraw the Vessel's Class.

4.4.3 When a Vessel proceeds to sea without having rectified a Condition of Class which was required to be dealt with before leaving port, the Class will be withdrawn with immediate effect.

4.4.4 If the Society becomes aware that a Vessel continues operation with serious damage or defects in violation of Class requirements, the Class may be withdrawn with effect from the time this became known to the Society. The Class withdrawal may be made retroactively.

4.4.5 When it is considered that an Owner's failure to comply with Rule requirements is sufficiently serious or fraudulent the withdrawal of Class may, at the discretion of the Society, be extended to include other Vessels controlled or operated by the same Owner.

4.4.6 If any outstanding debt owed to the Society is not paid within a notified date, the Society may withdraw the Vessel's Class with one month's written notice. This also applies when the obligation to pay rests with a Builder or with the Vessel's previous Owner. In special cases a shorter notice may be given.

4.4.7 If the Owner makes a general assignment for the benefit of his creditors or if any proceedings are commenced in court or any order or judgement is given by any court for liquidation, winding up of the Owner, the Society may withdraw the Class with immediate effect.

4.5 Re-assignment of Class following Class withdrawal

4.5.1 In all other cases than that given in [4.4.1], and if the circumstances leading to withdrawal of Class no longer exist, a Vessel may be re-assigned Class upon written request. The extent of Survey will in such instances be decided by the Society.

4.5.2 The Society reserves the right to decline an application for re-assignment of Class.

4.5.3 A new Class Certificate will be issued when the Survey has been satisfactory completed and the Society is satisfied that the requirements for retention of Class have been met.

4.5.4 When the Vessel is re-assigned Class, the Society will:

- inform the Owner
- inform the Flag Administration
- make an entry to this effect in the Society's "Register of Ships"
- make the information publicly available.

4.6 Force Majeure

4.6.1 If due to force majeure, the ship is not in port or is not accessible for Surveys when Surveys become overdue, the Society may allow the Vessel to sail in Class. This is provided that the ship proceeds directly to an agreed port and, if necessary, proceeds in ballast to an agreed repair facility at which the Survey can be completed. In this context the "Force Majeure" means damage to the Vessel, unforeseen inability of Surveyors to attend the Vessel due to governmental restrictions on right of access or movement of personnel.

SECTION 5 Class notations

5.1 General

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

5.1.2 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.

5.1.3 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

5.2 Construction marks

5.2.1 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.

5.3 Class symbols

5.3.1 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 (-).

5.3.2 **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**

5.4 Service notations

5.4.1 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.

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

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

5.4.4 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.

5.4.5 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.

5.4.6 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).

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

5.4.8 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.

5.4.9 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.

5.4.10 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.

5.4.11 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.

5.4.12 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.

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

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

5.5 Navigation notations

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

5.5.2 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.

5.5.3 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.

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

5.5.5 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.

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

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

5.6 Additional notations

5.6.1 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.

5.6.2 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.

5.6.3 **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.

5.6.4 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.

5.7 Special notations

5.7.1 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

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.

1.2.15 Remote Inspection Techniques (RIT)

Remote Inspection Technique is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor.

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.

1.5 Remote Inspection Techniques (RIT)

1.5.1 The RIT is to provide the information normally obtained from a close-up survey. RIT surveys are to be carried out in accordance with the requirements given here-in and the requirements of IACS Recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys'.These considerations are to be included in the proposals for use of a RIT which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Classification Society.

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

1.5.3 When using a RIT as an alternative to close-up survey, if not carried out by the Society itself, it is to be conducted by a firm approved as a service supplier according to UR Z17 and is to be witnessed by an attending surveyor of the Society.

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

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

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

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 and its closing appliances, hatch covers and coamings, 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 and to other spaces.
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 For ships complying with the requirements of SOLAS II-1/25 for hold water level detectors, the survey is to include an examination and a test, at random, of the water ingress detection system and of their alarms.

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 cargo.

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, since the last survey.
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, etc.
   (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, including close-up survey.

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 Cargo Holds

a) For ships up to 10 years of age, the cargo holds are to be surveyed as deemed necessary by the attending surveyor.

b) For ships 10-15 years of age, one forward and one after cargo hold and their associated tween deck spaces, shall be examined.

c) For ships over 15 years of age, all cargo holds and tween deck, spaces shall be examined.

d) 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.

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

2.2.16 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.

r) General examination of the refrigerating plant, if fitted.

s) General examination of the thruster installation, if fitted.

t) Examination of the automation installation, if fitted.

u) Examination of the dynamically position systems, if fitted.

v) Examination of systems related to additional class notation, if any.

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.

o) The general emergency alarm is to be examined as necessary.

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 of age :

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 For ships of 5 years old and over, and less than 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 10 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.

3.3 Intermediate Survey - Machinery

3.3.1 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 All cargo holds, ballast tanks, including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing.

4.1.3 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. The chain locker holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker tested. 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. Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or 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. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out.

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 fresh water tanks may be tested by filling with the respective liquid, to the highest point that liquid will rise under service condition. Tank testing of fuel oil, lube oil and fresh water 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.

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.

4.5.4 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.

4.5.5 The surveyor may extend the testing or deemed necessary.

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, including the plating and plating and framing, bilges and drain wells, sounding, venting pumping and drainage arrangements.

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, including close-up survey of hatch cover plating and hatch coaming plating. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey shall be done of accessible parts of hatch covers structures.

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

(i) stowage and securing in open condition;
(ii) proper fit and efficiency of sealing in closed conditions;
(iii) 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.

4.8.4 For designs where the inner parts cannot be properly inspected from outside, this is to include removal of the head from the air pipe. Particular attention is to be paid to the condition of the zinc coating in heads constructed from galvanised steel.

4.9 Thickness measurements

4.9.1 Thickness measurements are to be carried out according to *Sec 13*.

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.

5.3 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 If no integral fuel oil tank exists in way of cargo length area, **one integral fuel oil tank** outside engine room (if fitted) is to be internally examined.

5.3.6 **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 13*.

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 If no integral fuel oil tank exists in way of cargo length area, **one integral fuel oil tank** outside engine room (if fitted) is to be internally examined.

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

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

6.3.8 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 13*.

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 If no integral fuel oil tank exists in way of cargo length area, **two integral fuel oil tanks** outside engine room (if fitted) are to be internally examined.

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

7.2.7 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.

7.2.8 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 13*.

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. Where applicable, pressure test of the rudder may be requested as deemed necessary by the surveyor.

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. Other propulsion systems which also have manoeuvring characteristics (such as directional propellers, vertical axis propellers, water jet units) are to be examined externally with focus on the condition of gear housing, propeller blades, bolt locking and other fastening arrangements. Sealing arrangement of propeller blades, propeller shaft and steering column shall be verified.

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.

9.2.4 On ships less than 15 years old, propellers with key less connections to the screw shaft are not required to be backed off.

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.

9.7 Revised survey requirements of propeller shafts and tube shafts.

9.7.1 General

9.7.1.1 Application

Unless alternative means are provided to assure the condition of the propeller shaft assembly, these requirements apply to all vessels with conventional shafting fitted with a propeller as follows:

a) from 1 January 2016 for ships delivered on or after 1 January 2016;
b) after the first shaft survey scheduled on or after 1 January 2016, for ships delivered before 1 January 2016.

Upon the completion of the first shaft survey scheduled on or after 1 January 2016, the designation of dates for the next shaft survey is to be made based upon the requirements of this paragraph.

9.7.1.2 Definitions

(See also Diagram 1)

Shaft: For the purpose of this shaft is a general definition that includes:

- Propeller shaft
- Tube shaft

The definition does not include the intermediate shaft(s) which is (are) considered part of the propulsion shafting inside the vessel.

Propeller Shaft: Propeller shaft is the part of the propulsion shaft to which the propeller is fitted. It may also be called screwshaft or tailshaft.

Tube Shaft: Tube shaft is a shaft placed between the intermediate shaft and propeller shaft, normally arranged within a stern tube or running in open water. It may also be called **Stern Tube Shaft**.

Sterntube: Tube or pipe fitted in the shell of a ship at the stern (or rear part of the ship), below the waterline, through which passes the tube shaft or aftermost section of the propeller-shaft. Sterntube is the housing of the shaft bearings, generally two (one aft and one fore), that sustain the shaft and allows its rotation with less frictional resistance. The stern tube also accommodates the shaft sealing arrangement.

Close Loop (system) Oil Lubricated bearing: Closed loop oil lubricating systems use oil to lubricate the bearings and are sealed against the environment (seawater) by adequate sealing / gland devices.

Water Lubricated Bearing: Water lubricated bearings are bearings cooled / lubricated by water (fresh or salt).

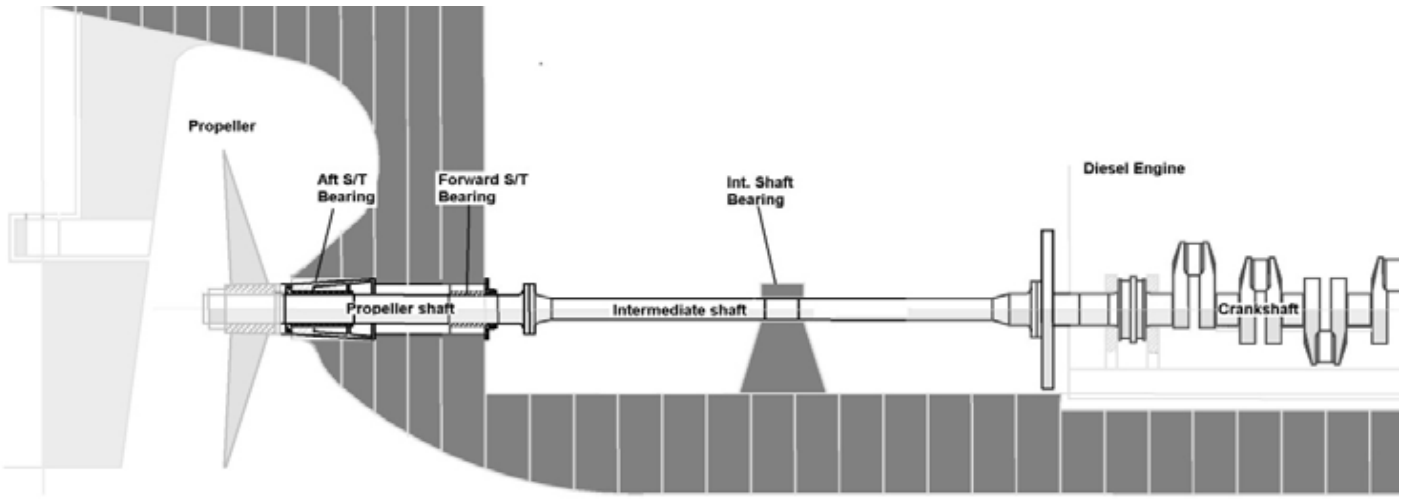


Diagram 1: Typical Shafting Arrangement

Closed Loop System Fresh Water Lubricated Bearing: Closed loop water lubricating systems use fresh water to lubricate the bearings and are sealed against the environment (such as seawater) by adequate sealing / gland devices.

Open Systems (water) : Open water lubricating systems use water to lubricate the bearings and are exposed to the environment.

Adequate means for protection against corrosion: An adequate means for protection against corrosion is an approved means for full protection of the core shaft against sea water intrusion and subsequent corrosion attack. Such means are used for the protection of common steel material against corrosion particularly in combination with water lubricated bearings.

Typical means are for example:

- continuous metallic, corrosion resistant liners,
- continuous cladding,
- multiple layer synthetic coating,
- multiple layer of fiberglass,
- combinations of above mentioned,
- rubber / elastomer covering coating.

The means for protection against corrosion are installed / applied according to class approved procedures.

Corrosion Resistant Shaft: Corrosion resistant shaft is made in approved corrosion resistant steel as core material for the shaft.

Sterntube Sealing System: Sterntube Sealing system is the equipment installed on the inboard extremity and, for closed systems, at outboard extremity of the sterntube.

Inboard Seal is the device fitted on the fore part of the sterntube that achieve the sealing against the possible leakage of the lubricant media in to the ship internal.

Outboard seal is the device fitted on the aft part of the sterntube that achieve the sealing against the possible sea water ingress and the leakage of the lubricant media.

Service records: Service records are regularly recorded data showing in-service conditions of the shaft(s) and may include, as applicable: lubricating oil temperature, bearing temperature and oil consumption records (for oil lubricated bearings) or water flow, water temperature, salinity, pH, make-up water and water pressure (for closed loop fresh water lubricated bearings depending on design).

Oil sample examination: An oil sample examination is a visual examination of the stern tube lubricating oil taken in presence of the surveyor with a focus on water contamination.

Lubricating oil analysis: Lubricating oil analysis is to be carried out at regular intervals not exceeding six (6) months taking into account IACS Rec. 36. The documentation on lubricating oil analysis is to be available on board.

Oil samples, to be submitted for the analysis, should be taken under service conditions.

Fresh Water sample test : Fresh water sample test should be carried out at regular intervals not exceeding six (6) months Samples are to be taken under service conditions and are to be representative of the water circulating within the sterntube. Analysis results are to be retained on board and made available to the surveyor. At time of survey the sample for the test has to be taken at the presence of the surveyor.

Fresh water sample test shall include the following parameters:

- chlorides content,
- pH value,
- presence of bearing particles or other particles (only for laboratory analysis, not required for tests carried out in presence of the surveyor).

Keyless connection: Keyless connection is the forced coupling Methodology between the shaft and the propeller without a key achieved through interference fit of the propeller boss on the shaft tapered end.

Keyed connection: Keyed connection is the forced coupling Methodology between the shaft and the propeller with a key and keyway achieved through the interference fit of the propeller boss on the shaft tapered end.

Flanged connection: Flanged connection is the coupling Methodology, between the shaft and the propeller, achieved by a flange, built in at the shaft aft end, bolted to propeller boss.

Alternative means: Shafting arrangements such as, but not limited to, an approved Condition Monitoring Scheme and / or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods as applicable in this paragraph.

9.7.2 Oil Lubricated shafts or Closed Loop System Fresh Water Lubricated Shafts (closed system)

9.7.2.1 Shaft Survey Methods

a) METHOD 1

The survey is to consist of:

- Drawing the shaft and examining the entire shaft, seals system and bearings.
- For keyed and keyless connections:
  - Removing the propeller to expose the forward end of the taper,
  - Performing a non-destructive examination (NDE) by an approved surface crack detection method all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted). For shaft provided with liners the NDE shall extended to the after edge of the liner.
- For flanged connection:
  - Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method.
- Checking and recording the bearing clearances.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Verification of the satisfactory conditions of inboard and outboard seals during the reinstallation of the shaft and propeller.
- Recording the bearing weardown measurements (after re-installation)

b) METHOD 2

The survey is to consist of:

- For keyed and keyless connections:
  - Removing the propeller to expose the forward end of the taper,
  - Performing a non-destructive examination (NDE) by an approved surface crack detection Method all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted).
- For flanged connection:
  - Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection Method.
- Checking and recording the bearing wear down measurements.
- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Seal liner found to be or placed in a satisfactory condition.
- Verification of the satisfactory re-installation of the propeller including verification of satisfactory conditions of inboard and outboard seals.

Pre-requisites to satisfactorily verify in order to apply METHOD 2:

- Review of service records.
- Review of test records of:
  - Lubricating Oil analysis (for oil lubricated shafts), or
  - Fresh Water Sample test (for closed system fresh water lubricated shafts).
- Oil sample Examination (for oil lubricated shafts), or Fresh Water Sample test (for closed system fresh water lubricated).
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.

c) METHOD 3

The survey is to consist of:

- Checking and recording the bearing weardown measurements.
- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Seal liner found to be or placed in a satisfactory condition.
- Verification of the satisfactory conditions of inboard and outboard seals.

Pre-requisites to satisfactorily verify in order to apply METHOD 3:

- Review of service records.
- Review of test records of:
  - Lubricating Oil analysis (for oil lubricated shafts), or
  - Fresh Water Sample test (for closed system fresh water lubricated shafts).

- Oil sample Examination (for oil lubricated shafts), or Fresh Water Sample test (for closed system fresh water lubricated).
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.

9.7.2.2 Shaft extension surveys - Extension types

a) Extension up to 2.5 years

The survey is to consist of:

- Checking and recording the bearing wear down measurements, as far as practicable.
- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Verification of the effectiveness of the inboard seal and outboard seals.

Pre-requisites to satisfactorily verify in order to apply EXTENSION UP TO 2.5 YEARS:

- Review of service records.
- Review of test records of:
  - Lubricating Oil analysis (for oil lubricated shafts), or
  - Fresh Water Sample test (for closed system fresh water lubricated shafts).
- Oil sample Examination (for oil lubricated shafts), or Fresh Water Sample test (for closed system fresh water lubricated).
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.
- Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

b) Extension up to 1 year

The survey is to consist of:

- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Verification of the effectiveness of the inboard seal and outboard seals.

Pre-requisites to satisfactorily verify in order to apply EXTENSION UP TO 1 YEAR:

- Review of the previous weardown and / or clearance recordings.
- Review of service records.
- Review of test records of :
  - Lubricating Oil analysis (for oil lubricated shafts), or
  - Fresh Water Sample test (for closed system fresh water lubricated shafts).
- Oil sample Examination (for oil lubricated shafts), or Fresh Water Sample test (for closed system fresh water lubricated).
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.
- Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

c) Extension up to 3 months

The survey is to consist of:

- Visual Inspection of all accessible parts of the shafting system.
- Verification of the effectiveness of the inboard seal.

Pre-requisites to satisfactorily verify in order to apply EXTENSION UP TO 3 MONTHS:

- Review of the previous weardown and/or clearance recordings.
- Review of service records.
- Review of test records of.
  - Lubricating Oil analysis (for oil lubricated shafts), or
  - Fresh Water Sample test (for closed system fresh water lubricated shafts).
- Oil sample Examination (for oil lubricated shafts), or Fresh Water Sample test (for closed system fresh water lubricated).
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.
- Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

9.7.2.3 Oil lubricated shafts

9.7.2.3.1 Survey intervals

For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

a) Flanged propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
B) **Method 2** every 5 years (pre- requisites have to be fulfilled), or
C) **Method 3** every 5 years (pre-requisites have to be fulfilled).

c) Keyless propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
B) **Method 2** every 5 years (pre-requisites have to be fulfilled), or
C) **Method 3** every 5 years (pre-requisites have to be fulfilled). The maximum interval between two surveys carried out according to Method 1 or Method 2 shall not exceed 15 years, except in the case when one extension for no more than three months is granted.

c) Keyed propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
B) **Method 2** every 5 years (pre-requisites have to be fulfilled).

9.7.2.3.2 Survey extensions

For all types of propeller connections, the interval between two consecutive surveys may be extended after the execution of extension survey as follows:

a) **Extension up to a maximum of 2.5 years**: no more than one extension can be granted. No further extension, of other type, can be granted.

b) **Extension up to a maximum of 1 year**: no more than two consecutive "one year extensions" can be granted. In the event an additional extension is requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.

c) **Extension up to a maximum of 3 months**: no more than one "three months extension" can be granted. In the event an additional extension is requested the requirements of the "one year extension" or "2.5 years extension" are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of one year or 2.5 years.

The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.
If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

9.7.2.4 Closed loop system fresh water lubricated shafts

The maximum interval between two surveys carried out according to Method 1 shall not exceed 15 years. An extension for no more than three months can be granted.

9.7.2.4.1 Survey intervals

For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

a) Flanged propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
B) **Method 2** every 5 years (pre-requisites have to be fulfilled), or
C) **Method 3** every 5 years (pre-requisites have to be fulfilled).

b) Keyless propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
B) **Method 2** every 5 years (pre-requisites have to be fulfilled), or
C) **Method 3** every 5 years (pre-requisites have to be fulfilled).

c) Keyed propeller connection

The following Methods are applicable:

A) **Method 1** every 5 years, or
C) **Method 2** every 5 years (pre-requisites have to be fulfilled).

9.7.2.4.2 Survey extensions

For all types of propeller connections, the interval between two consecutive surveys may be extended after the execution of extension survey as follows:

a) Extension up to a maximum of 2.5 years, no more than one extension can be granted. No further extension, of other type, can be granted.
b) Extension up to a maximum of 1 year, no more than two consecutive extensions can be granted. In the event an additional extension is requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.

c) Extension up to a maximum of 3 months, no more than one "three months extension" can be granted. In the event an additional extension is requested the requirements of the "one year extension" or "2.5 years extension" are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of one year or 2.5 years.

The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.

If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

The maximum interval between two surveys carried out according to Method 1 shall not exceed 15 years, except in the case when one extension for no more than three months is granted.

TABLE OF SURVEY INTERVALS (CLOSED SYSTEMS)			
SURVEY INTERVALS (closed systems)			
Oil Lubricated			
	Flanged Propeller Coupling	Keyless Propeller Coupling	Keyed Propeller Coupling[b]
Every five years[a]	Method 1 or Method 2 or Method 3	Method 1 or Method 2 or Method 3[c]	Method 1 or Method 2
Extension 2.5 Y	Yes[d]	Yes[d]	Yes[d]
Extension 1 Y	Yes[e]	Yes[e]	Yes[e]
Extension 3 M	Yes[f]	Yes[f]	Yes[f]
Closed Loop System Fresh Water Lubricated			
	Flanged Propeller Coupling	Keyless Propeller Coupling	Keyed Propeller Coupling[b]
Every five years[a]	Method 1[g] or Method 2or Method 3	Method 1[g] or Method 2or Method 3	Method 1[g] or Method 2
Extension 2.5 Y	Yes[d]	Yes[d]	Yes[d]
Extension 1 Y	Yes[e]	Yes[e]	Yes[e]

General notes:
For surveys (Method 1, or Method 2, or Method 3) completed within 3 months before the shaftsurvey due date, the next period will start from the shaft survey due date.

The extension survey should normally be carried out within 1 month of the shaft survey due dateand the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

Notes:
a: unless an Extension type (Extension 2.5 Y, Extension 1 Y, Extension 3 M) is applied inbetween.

b: Method 3 not allowed.

c: The maximum interval between two surveys carried out according to Method 1 or Method 2 shall not exceed 15 years, except in the case when one extension for no more than three monthsis granted.

d: no more than one extension can be granted. No further extension of other type can begranted.

e: no more than two consecutive extensions can be granted. In the event an additional extensionis requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.

f: no more than one three months extension can be granted. In the event an additional extensionis requested the requirements of the "one year extension" or "2.5 years extension" are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of one year or 2.5 years.

g: The maximum interval between two surveys carried out according to Method 1 shall not be more than 15 years.

9.7.3 Water Lubricated shafts (open systems)

9.7.3.1 Shaft Survey Methods

a) METHOD 4

The survey is to consist of:

- Drawing the shaft and examining the entire shaft (including liners, corrosion protection system and stress reducing features, where provided), inboard seal system and bearings.
- For keyed and keyless connections:
  - removing the propeller to expose the forward end of the taper,
  - performing a non-destructive examination (NDE) by an approved surface crack detection Method all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted). For shaft provided with liners the NDE shall be extended to the after edge of the liner.
- For flanged connection:
  - Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method.
- Checking and recording the bearing clearances.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Verification of the satisfactory conditions of inboard seal during re-installation of the shaft and propeller.

9.7.3.2 Shaft extension surveys - Extension types

a) Extension up to 1 year

The survey is to consist of:

- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be - out of balance.
- Checking and recording the clearances of bearing.
- Verification of the effectiveness of the inboard seal.

Pre-requisites to satisfactorily verify in order to apply EXTENSION UP TO 1 YEAR:

- Review of the previous clearance recordings.
- Service records.
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.
- Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

b) Extension up to 3 months

The survey is to consist of:

- Visual Inspection of all accessible parts of the shafting system.
- Verification that the propeller is free of damages which may cause the propeller to be out of balance.
- Verification of the effectiveness of the inboard seal.

Pre-requisites to satisfactorily verify in order to apply EXTENSION UP TO 3 MONTHS:

- Review of the previous clearance recordings.
- Service records.
- Verification of no reported repairs by grinding or welding of shaft and/or propeller.
- Confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

9.7.3.3 Shaft Survey Intervals

9.7.3.3.1 Survey Intervals

The following survey intervals between surveys according to Method 4 are applicable to all types of propeller connections.

- For keyless propeller connections the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (NDE) shall not exceed 15 years.
- For surveys completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.

9.7.3.3.1.1 Configurations allowing 5 year intervals

- Single shaft operating exclusively in fresh water.
- Single shaft provided with adequate means of corrosion protection, single corrosion resistant shaft.
- All kinds of multiple shafts arrangements

9.7.3.3.1.2 Other systems

Shaft not belonging in one of the configurations listed in **9.7.3.3.1.1** has to be surveyed according to Method 4 every 3 years.

9.7.3.3.2 Survey extensions

For all types of propeller connections, the interval between two consecutive surveys may be extended after the execution of extension survey as follows:

a) **Extension up to a maximum of 1 year**: no more than one extension can be granted. No further extension, of other type, can be granted.

b) **Extension up to a maximum of 3 months**: no more than one "three months extension" can be granted. In the event an additional extension is requested the requirements of the "one year extension" are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of one year.

The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date.

If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date of the extension survey was completed.

TABLE OF SURVEY INTERVALS (OPEN SYSTEMS)			
SURVEY INTERVALS (open systems)			
- **Single Shaft operating exclusively inFresh Water.** - **Single Shaft provided with adequate means of corrosion protection, Single corrosion resistant shaft.** - **All kinds of Multiple shaft arrangements.**		**Other shaft configuration.**	
All kinds of Propeller Coupling[d]		All kinds of Propeller Coupling[d]	
Every five years[a]	Method 4	Every three years[a]	Method 4
Extension 1 Y	Yes[b]	Extension 1 Y	Yes[b]
Extension 3 M	Yes[c]	Extension 3 M	Yes[c]

General notes:

For surveys (Method 4) completed within 3 months before the shaft survey due date, the nextperiod will start from the shaft survey due date.

The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extensioncounts from the date of the extension survey was completed.

Notes:

a: unless an Extension type (Extension 1 Y, Extension 3 M) is applied in between.

b: no more than one extension can be granted. No further extension, of other type, can begranted.

c: no more than one extension can be granted. In the event an additional extension is requested the requirements of the one year extension are to be carried out and the shaftsurvey due date prior to the previous extension is extended for a maximum of one year. d: For keyless propeller connections the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (NDE) shall not exceed 15 years.

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 and gas 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.

10.2.7 For **thruster installations,** all the necessary examinations of the machinery and electrical installation shall take place. During the examinations and checks such as clearance readings, tightness of hub and sealing for controllable pitch propellers are to be verified . Dismantling of the assembly for the examination of internal parts may be required in the foregoing checks out are not satisfactory.

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, or tested as considered necessary by the Surveyor. 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 2.3.2 of this chapter.

10.5.2 Emergency escapes / exits are to be inspected.

10.6 Additional requirements

10.6.1. Remote and/or automatic controls of the automatic installations, are to be examined, if fitted.

10.6.2 The control systems, position references, sensors, thrusters, power systems and other systems of the dynamically position systems, are to be examined, if fitted.

10.6.3 The machinery, electrical installations and other systems related to the refrigerating plants, are to be examined, if fitted.

10.6.4 The machinery, electrical installations and other systems related to additional class notations, are to be examined, if fitted.

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

Plant maintenance Scheme (PMS) for Machinery

12.1 General

12.1.1 Application

12.1.1.1 These requirements apply to an approved Planned Maintenance Scheme for Machinery (PMS) as an alternative to the Continuous Machinery Survey (CMS).

12.1.1.2 It considers surveys to be carried out on the basis of intervals between overhauls recommended by manufacturers, documented operator's experience and a condition monitoring system, where fitted.

12.1.1.3 This scheme is limited to components and systems covered by CMS.

12.1.1.4 Any items not covered by PMS shall be surveyed and credited in the usual way.

12.1.1.5 The planned maintenance survey does not supersede the annual surveys, or the other periodical and occasional surveys.

12.1.2 Maintenance Intervals

12.1.2.1 In general, the intervals for PMS shall not exceed those specified for CMS. However, for components where the maintenance is based on running hours longer intervals may be accepted as long as the intervals are based on the manufacturer's recommendations.

12. 1.3 Onboard responsibility

12.1.3.1 The chief engineer shall be the responsible person on board in charge of the PMS.

12.1.3.2 Documentation on overhauls of items covered by the PMS shall be reported and signed by the chief engineer.

12.1.3.3 Access to computerized systems for updating of the maintenance documentation and maintenance program shall only be permitted by the chief engineer or other authorized person.

12.2 Procedures and conditions for approval of a PMS

12.2.1 System Requirements

12.2.1.1 The PMS shall be programmed and maintained by a computerized system. Other systems may be accepted as deemed by the society.

12.2.1.2 The system shall be submitted to the society for review and approval.

12.2.1.3 Computerized systems shall include back-up devices, such as disks/tapes, CDs, which are to be updated at regular intervals.

12.2.2 Documentation and information

12.2.2.1 The following documentation shall be submitted for the approval of the scheme:
(i) organization chart identifying areas of responsibility.
(ii) documentation filling procedures.
(iii) listing of equipment to be considered by classification in PMS.
(iv) machinery identification procedure.
(v) preventive maintenance sheet(s) for each machine to be considered.
(vi) listing and schedule of preventive maintenance procedures

12.2.2.2 In addition to the above documentation the following information shall be available on board:
(i) all clauses in 12.2.2.1 in an up-to-date fashion.
(ii) maintenance instructions (manufacturer's and shipyard's).
(iii) reference documentation (trend investigation procedures etc.).
(iv) records of maintenance including repairs and renewals carried out.

12.2.3 Approval validity

12.2.3.1 When the PMS is approved a "Certificate of Approval for Planned Maintenance Scheme" is issued. However, other equivalent certification or class notation may be issued according to the procedure in use in each individual Member Society. In any case, the certification is to be kept on board.

12.2.3.2 An implementation Survey shall be carried out to confirm the validity of the certificate/class notation (see 12.3.1).

12.2.3.3 An annual report covering the year's service, including the information as required under the clauses iii and v as well as the information on changes to other clauses in 12.2.2.1, shall be reviewed by the Society.

12.2.3.4 An Annual Audit shall be carried out to maintain the validity of the PMS (see 12.3.2).

12.2.3.5 The survey arrangement for machinery under PMS can be cancelled by the Society if PMS is not being satisfactorily carried out either from the maintenance records

or the general condition of the machinery, or when the agreed intervals between overhauls are exceeded.

12.2.3.6 The case of sale or change of management of the ship or transfer of class shall cause the approval to be reconsidered.

12.2.3.7 The shipowner may, at any time, cancel the survey arrangement for machinery under PMS by informing the Society in writing and for this case the items which have been inspected under the PMS since the last annual survey can be credited for class at the discretion of the attending surveyor.

12. 3 Surveys

12.3.1 Implementation Survey

12.3.1.1 The Implementation Survey shall be carried out by the Society's surveyor within one year from the date of approval of the PMS.

12.3.1.2 During the implementation survey the following shall be verified by a surveyor to ensure :

(i) the PMS is implemented according to the approval documentation and is adapted to the type and complexity of the components/system on board.

(ii) the PMS is producing the documentation required for the Annual Audit and the requirements of surveys and testing for retention of class are complied with.

(iii) the onboard personnel is familiar with the PMS 12.3.1.3 When this survey is carried out and the implementation is found in order, a report describing the PMS shall be submitted to the Society and the approved PMS may replace the CMS.

12.3.2 Annual Audit (Not related to ISM Audit)

12.3.2.1 An annual audit of the PMS shall be carried out by a Society's surveyor and preferably concurrently with the annual survey of machinery.

12.3.2.2 The surveyor shall review the annual report or verify that it has been reviewed by the Society.

12.3.2.3 The purpose of this survey shall be to verify that the scheme is being correctly operated and that the machinery has been functioning satisfactorily since the previous survey. A general examination of the items concerned shall be carried out.

12.3.2.4 The performance and maintenance records shall be examined to verify that the machinery has functioned satisfactorily since the previous survey or action has been taken in response to machinery operating parameters exceeding acceptable tolerances and the overhaul intervals have been maintained.

12.3.2.5 Written details of break-down or malfunction shall be made available.

12.3.2.6 Description of repairs carried out shall be examined. Any machinery part, which has been replaced by a spare one, due to damage, is to be retained on board - where possible - until examined by a Society's Surveyor.

12.3.2.7 Upon satisfactory completion of the above requirements, the Society shall retain the PMS.

12.3.3 Damage and repairs

12.3.3.1 The damage of components/machinery shall be reported to the Society. The repairs of such damaged components / machinery shall be carried out to the satisfaction of the Society's surveyor.

12.3.3.2 Any repair and corrective action regarding machinery under PMS system shall be recorded in the PMS logbook and repair verified by the Society's surveyor at the Annual Audit.

12.3.3.3 In the case of overdue outstanding conditions of class or a record of unrepaired damage which would affect the PMS the relevant items shall be kept out of the PMS until the condition of class is fulfilled or the repair is carried out.

SECTION 13

Thickness Measurements

13.1 General

13.1.1 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.

13.1.2 Thickness measurements are to be carried out by a qualified company, certified by INSB Class Validity of the approval granted will depend on the continued qualification.

13.1.3 Thickness measurements are normally to be carried out under the surveillance of the attending Surveyor to INSB Class. The surveyor is to be on board to the extent necessary to control the process. 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.

13.1.4 The extent of thickness measurements on the occasion of Special Class Surveys is given in *Table A*. Number of measurements may be increased as deemed necessary by the surveyor.

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

13.1.6 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.*

13.1.7 Thickness Measurement Reports stated in *13.1.1* 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.

13.1.8 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.

13.1.9 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.

13.1.10 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.

13.1.11 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.

13.1.12 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.

13.1.13 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.

13.1.14 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.

13.1.15 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**
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	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 – All tank top plates – Selected bottom plates – All wind and water strakes	Within the cargo length area or 0.5*L* amidships: – Each deck plate – 3 transverse sections – Each tank top plate – Each bottom plate, including lower turn of bilge – Duct keel or pipe tunnel plating and internals – All 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 – Representative exposed superstructure deck plating – All wind and water strakes – Each bottom plate, including lower turn of bilge
	All 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
		Selected internal structural members such as floors and longitudinals, transverse frames, web frames, deck beams, tweendecks, girders, etc	Internals of forepeak/after peak, plating of sea chests, shell plating I.W.O. overboard discharges as considered necessary by the attending surveyor.

Notes :

a) Suspect areas, are locations showing substantial corrosion and/or are considered by the surveyor to be prone to rapid wastage.
b) 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.
c) 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).

TABLE B Thickness Measurement Report (Sample)

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

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

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. The initial Laying-up survey shall take place at the beginning of the lay-up period. Thereafter, the first Annual Condition Survey is to take place not later than 12 months from the initial Laying-up survey, while next Annual Condition Survey shall take place not later than 12 months, from the previous one.

1.1.2 In such a case, the class of the ship will be assigned and 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.

1.2 Re-commissioning survey

1.2.1 The scope of the re-commissioning survey is to include:

- a general examination of the hull, deck fittings, safety systems, machinery installations (including boilers whose survey is not due) and steering gear
- all periodical surveys due at the date of re-commissioning or which became overdue during the lay-up period
- dealing with the recommendations due at the date of recommissioning or which became due during the lay-up period.

1.2.2 For the hull the following is to be carried out:

- examination of shell plating above the waterline, deck plating, hatch covers and coamings.
- examination of load line items.
- overall survey of all cargo tanks/holds.
- overall survey of representative ballast tanks when the lay-up period does not exceed two years.
- overall survey of all ballast tanks when the lay-up period is two years and over.
- function tests of bilge and ballast systems.

1.2.3 For the deck fittings the following is to be carried out:

- examination of the fire main under working pressure.
- where possible, examination of deck piping under working pressure.
- function tests of class items.
- checking inert gas installation under working condition after inspection of water seal and function test of deck non-return valve and pressure/vacuum valves.

1.2.4 For machinery installations the following is to be checked:

- the analysis of lubricating oil of main engines, auxiliary engines, reduction gears, main thrust bearings and sterntube.
- the general condition of crankcase, crankshaft, piston rods and connecting rods of diesel engines.
- the crankshaft deflections of diesel engines. In addition when engines have been laid-up for more than two years, one piston is to be disconnected and one liner is to be removed for examination. Dismantling is to be extended if deemed necessary.
- the condition of blades of turbines through the inspection Doors.
- the condition of the water side of condensers and heat Exchangers.
- the condition of expansion arrangements.
- the condition of reduction gears through the inspection Doors.
- the condition after overhauling of pressure relief devices
- the test of bilge level alarms, when fitted.

1.2.5 The main and emergency electrical installations are to be tested. The parallel shedding of main generators and main switchboard safety devices are to be checked. An insulation resistance test of the electrical installation is to be performed.

1.2.6 For the fire prevention, detection and fire-fighting systems, the following is to be examined and/or tested:

- remote control for quick closing of fuel oil valves, stopping of fuel oil pumps and ventilation systems, closing of fire doors and watertight doors.
- fire detectors and alarms.
- fire-fighting equipment.

1.2.7 The automated installation is to be checked for proper operation.

1.2.8 When classed, the installations for refrigerated cargo Are to be examined under working conditions. Where the lay-up period exceeds two years, representative components of the installation are to be dismantled.

1.2.9 For other specific classed installations, a survey program is to be decided by the Society.

1.2.10 On completion of the above surveys, sea trials are to be performed in the presence of a Surveyor of the Society, as deemed necessary by the Society, depending on the duration of the lay-up period.

The sea trials are to include:
- verification of the satisfactory performance of the deck installations, main propulsion system and essential auxiliaries, including a test of the safety devices.
- an anchoring test.
- complete tests of steering gear.
- full head and full astern tests.
- tests of automated machinery systems, where applicable.

1.2.11 Recommissioning trials of specific installations and/or components, are to be performed, if deemed necessary by the Society, depending on the duration of the lay-up period.

1.3 Damage and Repair Surveys

1.3.1 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.

1.3.2 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.

1.3.3 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.

1.3.4 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.

1.3.5 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.

1.3.6 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.

1.3.7 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.

1.4 Surveys after modifications and maintenance repairs

1.4.1 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.

1.4.2 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.

1.4.3 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.

1.4.4 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.

1.4.5 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.

1.5 Unscheduled Surveys

1.5.1 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.

Section

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 and to surveys of machinery of Special Ship types, as indicated to this chapter. 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.

Chemical Tanker : A ship constructed or adapted and used for the carriage in bulk of any liquid product listed in Chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Goods in Bulk, IBC Code.

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, Chemical Tankers and Liquefied Gas Carriers, 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 or Chemical 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. For vessels built under the IACS Common Structural Rules, substantial corrosion is an extent of corrosion such that the assessment of the corrosion pattern indicates a measured thickness between t_{ren} + 0.5mm and t_{ren}. Renewal thickness is the minimum allowable thickness, in mm, below which renewal of structural members shall be carried out.

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 or Chemical 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.

Remote Inspection Techniques (RIT): Remote Inspection Techniques is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor.

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.

1.3.3 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 condition of class with a specific time limit.

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, concerning the hull structure and piping systems, 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, concerning the hull structure and piping systems, should be performed by two surveyors.

1.4.3 Thought each attending surveyor is not required to perform all aspects of the required survey, they shall consult with each other and do joint overall and close-up surveys to the extent necessary to determine the condition of the vessel areas to which this Code applies. The extent of these surveys shall be sufficient for the surveyors to agree on actions required to complete the survey with respect to renewals, repairs and other recommendations or conditions. Each surveyor shall co-sign the survey report or indicate their concurrence in an equivalent manner.

1.4.4 The following surveys may be witnessed by a single surveyor :
- Thickness measurements;
- Tank testing; and
- Repairs carried out in association with intermediate and renewal hull surveys, the extent of which have been agreed upon by the required two surveyors during the course of the surveys.

1.5 Survey Programme (applicable to Bulk Carriers, Oil Tankers and Chemical 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, Double Hull Oil Tankers and Chemical 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 and the pipes that are to undergo pipe testing as applicable;
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 and passages through structures.
b) Temporary staging and passages through structures.
c) Hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms.
d) Boats or rafts.
e) Portable ladders.
f) Other equivalent means.

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.

Notwithstanding the above requirements:

a) The use of a portable ladder fitted with a mechanical device to secure the upper end of the ladder is acceptable for the "close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating of the forward cargo hold" at Annual Survey.

b) The use of hydraulic arm vehicles or aerial lifts ("Cherry picker") may be accepted by the attending surveyor for the close-up survey of the upper part of side shell frames or other structures in all cases where the maximum working height is not more than 17 m.

1.7.6 Consideration may be given by the attending Surveyor to allow use of Remote Inspection Techniques (RIT) as an alternative to close-up survey. Surveys conducted using a RIT are to be completed to the satisfaction of the attending Surveyor. When RIT is used for a close-up survey, temporary means of access for the corresponding thickness measurements is to be provided unless such RIT is also able to carry out the required thickness measurements.

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

- Unmanned robot arm.
- Remotely Operated Vehicles (ROV).
- Unmanned Aerial Vehicles / Drones.
- Other means acceptable to the Classification Society.

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.

1.8.6. If breathing apparatus and/or other equipment is used as "Rescue and emergency response equipment" then it is recommended that the equipment should be suitable for the configuration of the space being surveyed.

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, Oil Tankers and Chemical 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, Oil Tankers and Chemical 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). For CSR ships these plans are to include for each structural element both the as-built and renewal thickness. Any thickness for voluntary addition is also to be clearly indicated on the plans. The midship section plan to be supplied on board the ship is to include the minimum allowable hull girder sectional properties for hold transverse section in all cargo holds.
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.
g) 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.

1.11.6 For Bulk Carriers with coatings of dedicated seamaster Ballast Tanks subject to PSPC standards (MSC.215 (82)), the Coating Technical file (CTF)| shall be available onboard.

On completion of the survey, the surveyor shall verify any maintenance, repair or recoating activities to these coatings which are documented within the CTF.

1.12 Procedures for thickness measurements

1.12.1 The required thickness measurements, shall 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, in any kind of survey.

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.

1.12.7 For vessels built under IACS Common Structure Rules, the extent of thickness measurements shall be in accordance with the Common Structural Rules.

1.13 Thickness measurements Acceptance Criteria

For Single-Skin Bulk Carriers, Double – Skin Bulk Carriers and Double Hull Oil Tankers built under IACS Common Structural Rules, the Acceptance Criteria is according to IACS Common Structural Rules and as specified in 1.13.1.

1.13.1 Acceptance criteria for pitting corrosion of CSR ships

1.13.1.1 Side structures of Single-Skin Bulk Carriers and of Double-Side Skin Bulk Carriers.

If pitting intensity in an area where coating is required, according to IACS Common Structural Rules[2] is higher than 15%), thickness measurements are to be performed to check the extent of pitting corrosion. The 15% is based on pitting or grooving on only one side of a plate.

In cases where pitting is exceeding 15%, as defined above, an area of 300 mm or more, at the most pitted part of the plate, is to be cleaned to bare metal and the thickness is to be measured in way of the five deepest pits within the cleaned area. The least thickness measured in way of any of these pits is to be taken as the thickness to be recorded.

a) Single - Skin Bulk Carriers

The minimum remaining thickness in pits, grooves or other local areas is to be greater than the following without being greater than the renewal thickness (t_{ren}):

- 75% of the as-built thickness, in the frame and end brackets webs and flanges.
- 70% of the as-built thickness, in the side shell, hopper tank and topside tank plating attached to the each side frame, over a width up to 30 mm from each side of it.

b) Double - Skin Bulk Carriers

The minimum remaining thickness in pits, grooves or other local areas shall be greater than 70% of the as-built thickness, in the side shell, hopper tank and topside tank plating attached to the each side frame, over a width up to 30 mm from each side of it, without being greater than the renewal thickness (t_{ren}).

1.13.1.2 Other structures of CSR Ships

For plates with pitting intensity less than 20%, the measured thickness, tm of any individual measurement is to meet the lesser of the following criteria:

$$t_m \geq 0.7\ (t_{as\text{-}built} - t_{voladd}) \quad mm$$
$$t_m \geq t_{ren} - 1 \quad mm$$

Where:

$t_{as\text{-}built}$ As-built thickness of the member, in mm

t_{voladd} Voluntary thickness addition; thickness, in mm, voluntarily added as the Owner's extra margin for corrosion wastage in addition to t_C

t_{ren} Renewal thickness; minimum allowable thickness, in mm, below which renewal of structural members is to be carried out

t_C Total corrosion addition, in mm, defined in IACS Common Structural Rules

t_m Measured thickness, in mm, on one item, i.e. average thickness on one item using the various measurements taken on this same item during periodical ship's in service surveys.

The average thickness across any cross section in the plating is not to be less than the renewal criteria for general corrosion given in IACS Common Structural Rules as applicable.

1.13.2 Acceptance criteria for edge corrosion of CSR ships

1.13.2.1 Provided that the overall corroded height of the edge corrosion of the flange, or web in the case of flat bar stiffeners, is less than 25%, of the stiffener flange breadth or web height, as applicable, the measured thickness, tm, is to meet the lesser of the following criteria:

$$t_m \geq 0.7\ (t_{as\text{-}built} - t_{vol\ add}) \quad mm$$
$$t_m \geq t_{ren} - 1 \quad mm$$

1.13.2.2 The average measured thickness across the breadth or height of the stiffener is not to be less than that defined in IACS Common Structural Rules.

1.13.2.3 Plate edges at openings for manholes, lightening holes etc. may be below the minimum thickness given in IACS Common Structural Rules provided that:

(a) the maximum extent of the reduced plate thickness, below the minimum given in IACS Common Structural Rules, from the opening edge is not more than 20% of the smallest dimension of the opening and does not exceed 100mm.

(b) rough or uneven edges may be cropped-back provided that the maximum dimension of the opening is not increased by more than 10% and the remaining thickness of the new edge is not less than t_{ren} - 1 mm.

1.13.3 Acceptance criteria for grooving corrosion of CSR ships

1.13.3.1 Where the groove breadth is a maximum of 15% of the web height, but not more than 30mm, see Figure 3, the measured thickness, tm, in the grooved area is to meet the lesser of the following criteria:

$$t_m \geq 0.75\ (t_{as\text{-}built} - t_{voladd}) \quad mm$$
$$t_m \geq t_{ren} - 0.5 \quad mm$$

but is not to be less than

$$t_m = 6 \text{ mm}$$

1.13.3.2 Structural members with areas of grooving greater than those in 1.13.3.1 above are to be assessed based on the criteria for general corrosion as defined in IACS Common Structural Rules1 using the average measured thickness across the plating/stiffener.

1.14 Remote Inspection Techniques (RIT)

1.14.1 The RIT is to provide the information normally obtained from a close-up survey. RIT surveys are to be carried out in accordance with the requirements given here-in and the requirements of IACS Recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys'. These considerations are to be included in the proposals for use of a RIT which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Classification Society.

1.14.2 The equipment and procedure for observing and reporting the survey using a RIT are to be discussed and agreed with the parties involved prior to the RIT survey, and suitable

time is to be allowed to set-up, calibrate and test all equipment beforehand.

1.14.3 When using a RIT as an alternative to close-up survey, if not carried out by the Society itself, it is to be conducted by a firm approved as a service supplier according to UR Z17 and is to be witnessed by an attending surveyor of the Society.

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

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

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

1.15 Evaluation of survey report

1.15.1 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.

1.15.2 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, in accordance with the provisions indicated in the MSC.461 (101).

1.15.3 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.

1.15.4 The final result of the evaluation of the ship's longitudinal strength required in *1.15.2*, 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.

1.15.5 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.

1.16 Reporting

1.16.1 A thickness measurement report is to be prepared. The report is to give the location of measurements, the thickness measured as well as corresponding original thickness.

Furthermore, the report is to give the date when the measurements were carried out, type of measurement equipment, names of personnel and their qualifications and has to be signed by the operator.

1.16.2 The Surveyor is to review the final thickness measurement report and countersign the cover page.

1.16.3 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.

1.16.4 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’s Head Office.

SECTION 2

Surveys of General Cargo Ships carrying Solid Bulk Cargoes

The present Section applies 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. For ships with hybrid cargo hold arrangements, e.g. with some cargo holds of single – side skin and others of double-side skin, the requirements of the present section are to be applied only to the structure in way of the single-side skin cargo hold region.

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 and its closing appliances, hatch covers and coamings, 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 and to other spaces.
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. For ships complying with the requirements of SOLAS II-1/25 for hold water level detectors, the survey is to include an examination and a test, at random, of the water ingress detection system and of their alarms.

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

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

2.1.7 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.

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

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

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

2.1.11 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, since the last survey.

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, etc.
(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, including close-up survey.

2.1.12 **Protection of other openings** is to be surveyed, including:

a) Hatchways, manholes, and scuttles in freeboard and superstructure decks.
b) Port lights together with dead covers.
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.

2.1.13 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.

2.1.14 Examination of Cargo Holds

2.1.14.1 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.

2.1.14.2 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.

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

2.1.15 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 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.
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.
d) When considered necessary by the Surveyor or, where extensive corrosion is found, thickness measurements are to be required.
e) In addition to the requirements above, areas found suspect at previous surveys are to be surveyed in accordance with the provisions indicated in *para 2.1.13.*

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 2.1.13.*

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 2.1.13*.
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*, survey of automatic air pipe heals and internal examination of fuel oil, lube oil and fresh water tanks 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 carried 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 2.1.11*, 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 Close-up survey and 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 3.3.6*). 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

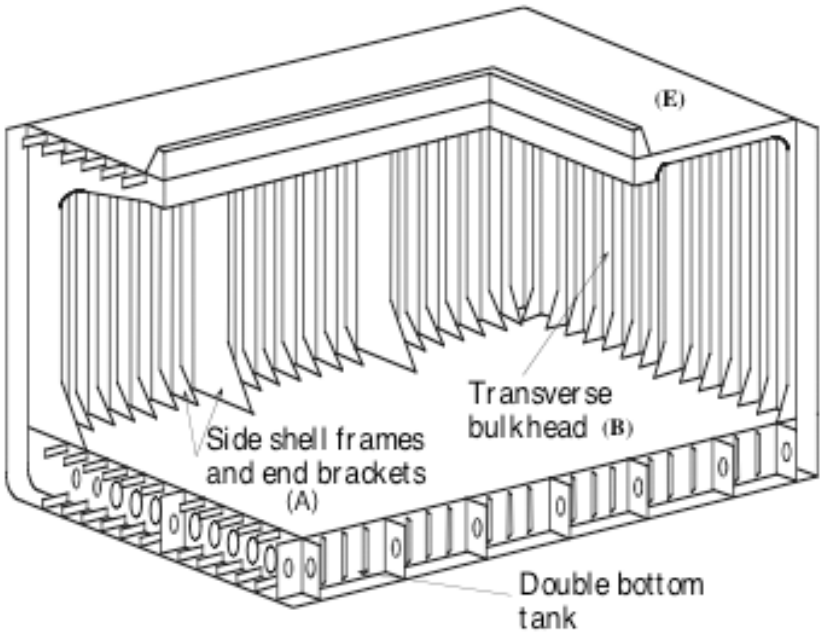
Special Survey I Age ≤ 5	Special Survey II 5 < Age ≤ 10	Special Survey III 10 < Age ≤ 15	Special Survey IV and Subsequent Age > 15
(A) Selected shell frames in one forward and one aft cargo hold and associated tween deck spaces **(B)** One Selected cargo hold transverse bulkhead **(C)** All cargo hold 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.

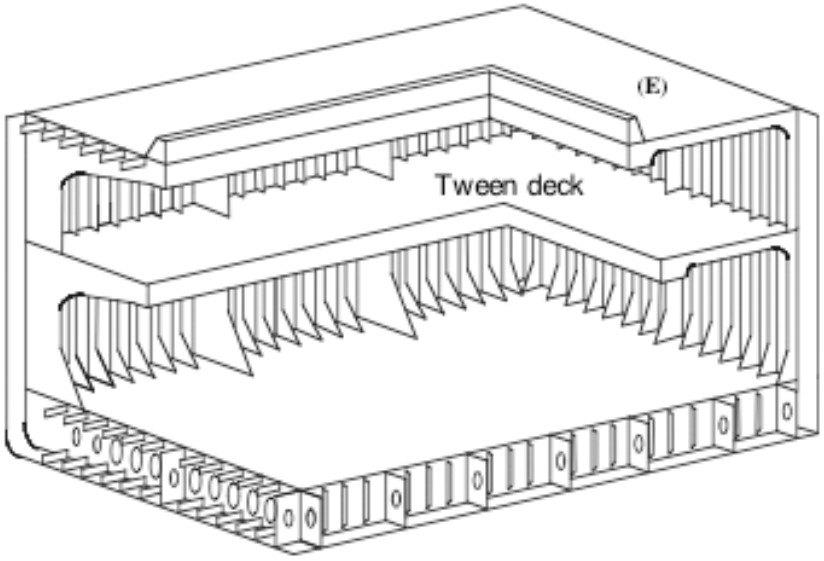
See Figs 1 and 2 for the areas corresponding to (A), (B), (C), (D), (E) and (F) .

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

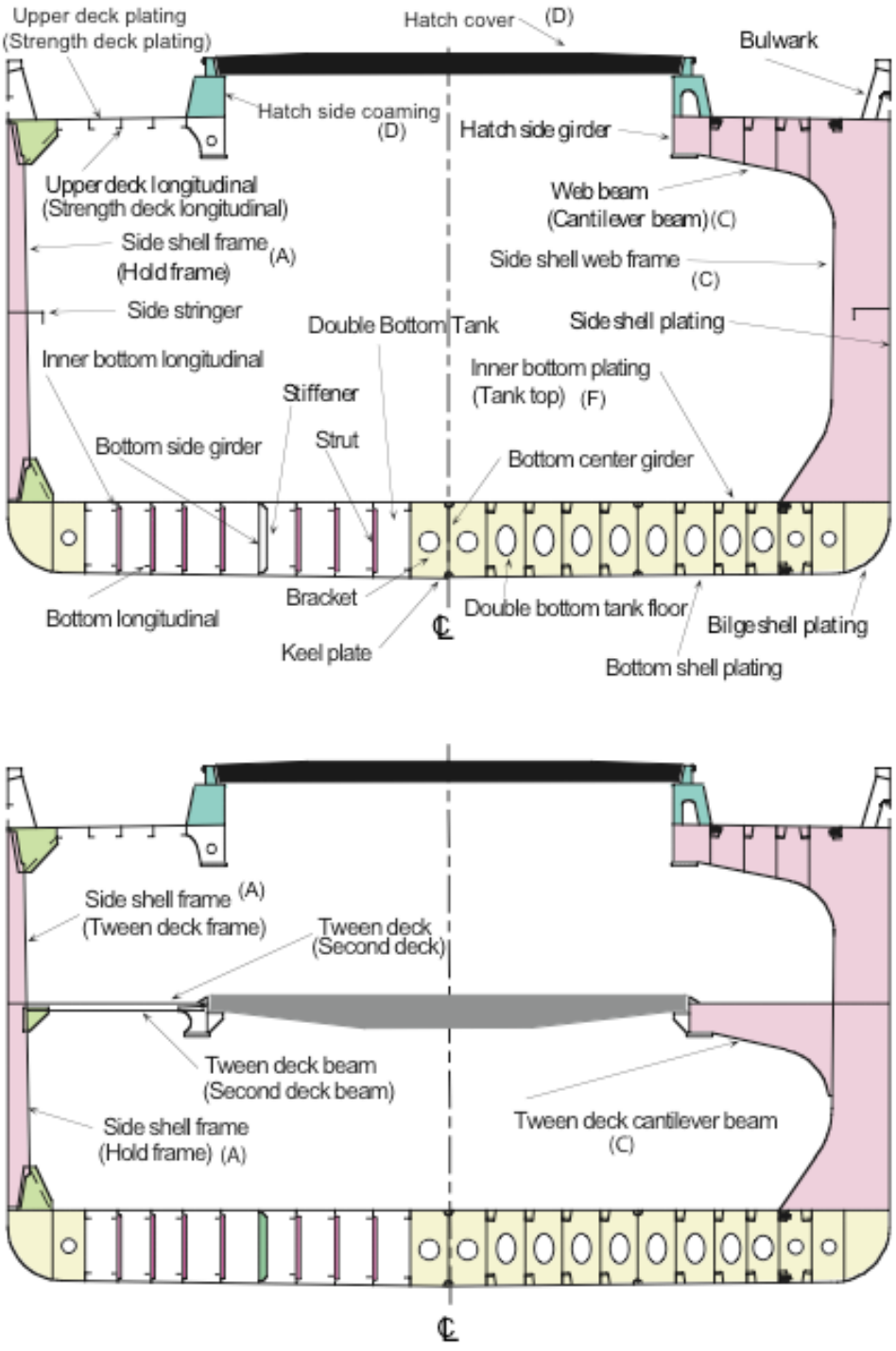


Figure 2 for Close-up Survey of General Cargo Ships carrying Solid Bulk Cargoes

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:

a. Suspect areas are locations showing substantial corrosion and/or are considered by the surveyor to be prone to rapid wastage.

b. 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.

c. 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 Bunker tanks				
- Engine Room	None	None	One	One
- Cargo Length Area	None	One	Two	Half, minimum 2
- If no tanks in Cargo Length Area, additional fuel tanks outside of engine room (if fitted)	None	One	One	Two
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 exposed 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 (3)

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.

3. Waiver may be considered for air pipe heads where there is substantial evidence of replacement after the last special survey.

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 MSC.461(101).

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.

   For vessels built under the IACS Common Structural Rules, the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.
d) Where the hard protective coating in cargo holds is found to be in GOOD condition, the extent of close-up
e) surveys and thickness measurements may be specially considered.
f) 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.

   For vessels built under the IACS Common Structural Rules, the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.
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. For vessels built under the IACS Common Structural Rules, the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.

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.

For vessels built under the IACS Common Structural Rules, the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.

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.

For vessels built under the IACS Common Structural Rules, the annual thickness gauging may be omitted where a protective coating has been applied in accordance with the coating manufacturer's requirements and is maintained in good condition.

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.

3.1.7.3.2 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, of Single-Skin Bulk Carriers 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.

3.2.2.2.3 An overall survey of all cargo holds of Double-Skin Bulk Carriers is to be carried out.

3.2.2.2.4 Where deemed necessary by the Surveyor as a result of the overall survey as described above for Double-Skin Bulk Carriers, the survey is to be extended to include a close-up survey of these areas of structure in the cargo holds selected by the Surveyor.

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 3.2.2.1.3, 3.2.2.1.4, 3.2.2.2.1, 3.2.2.2.4.*

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.

For vessels built under IACS Common Structural Rules, the identified substantial corrosion areas may be:

a) protected by coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in good condition, or alternatively
b) required to be measured at annual intervals.

3.2.2.3.5 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.

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.

3.2.3 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, internal examination of fuel tanks and pressure testing of all tanks are 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) Close-up Survey and Thickness measurements of the hatch cover and coaming plating and stiffeners are to be carried out in accordance with *Table I or Table II or 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.

For vessels built under IACS Common Structural Rules, the identified substantial corrosion areas may be:

a) protected by coating applied in accordance with the coating manufacturer's requirements and examined at annual intervals to confirm the coating in way is still in good condition, or alternatively
b) required to be measured at annual intervals.

3.3.6.5 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 MSC.461 (101).

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 MSC.461 (101).

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 tank top 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. For cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey / thickness measurements shall be done of accessible parts of hatch covers' structures.
(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 **(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)** 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 on one side of the ship (i.e.port or starboard) **(B)** 25% of ordinary transverse frames for transverse framing system or 25% of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in the foremost double side tanks. **(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 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 frames for transverse framing system or 25% of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in all double side tanks. **(C)**All cargo hold transverse bulkheads including internal structure of upper and lower stools, where fitted Areas **(D)** and **(E)** as for Special Survey II	**(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 for transverse framing system or all of longitudinals for longitudinal framing system on side shell and inner side plating at forward, middle and aft parts, in all double side tanks**.** Areas **(C), (D)** and **(E)** as for Special Survey III

(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. For cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey / thickness measurements shall be done of accessible parts of hatch covers' structures.
(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. For cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey / thickness measurements shall be done of accessible parts of hatch covers' structures.
(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 Annex 15 of IMO Resolution MSC.461(101)	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 Annex 15 of IMO Resolution MSC.461 (101) 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 12 of IMO Resolution MSC.461(101).	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 MSC 461 (101) 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 12 of IMO Resolution MSC 461(101).

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 or Table III* 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 or Table III* 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 or Table III* 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)	lower third of tank 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. Plate 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	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	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	Suspect plates	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
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 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
1. 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
2. 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

Surveys of Oil Tankers

Unless expressly provided otherwise, the present Section, applies 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 consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file. In addition, 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, temperature serving devices for bulkheads glands , gas detection system, bilge level monitoring devices and alarms
(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.
(f) Examination of the emergency lighting in cargo pump rooms of ships constructed after 1 July 2002.

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.
(c) Confirmation as far as practicable and applicable, that the remote means of closing the various openings are in order.

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.
e) Checking, when practicable, of the proper operation of the inert gas system .

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. For vessels built under IACS Common Structural Rules, the identified substantial corrosion areas are required to be examined and additional thickness measurements are to be carried out.

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.

4.2.2.4 For vessels built under IACS Common Structural Rules, the identified substantial corrosion areas are required to be examined and additional thickness measurements are to be carried out.

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 1.15.2*, 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 1.15.2*, 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.

4.2.7 Inert Gas System

4.2.7.1 The following is to be carried out :

a) Main parts such as the scrubber, washing machines, blowers, deck water seal and non-return valve are to be opened out as considered necessary and examined
b) Gas distribution lines and shut-off valves, including soot blower interlocking devices, are to be examined as deemed necessary.
c) All automatic shutdown devices and alarms are to be examined and tested.

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 are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken. For vessels built under IACS Common Structural Rules, the identified substantial corrosion areas are required to be examined and additional thickness measurements are to be carried out at annual and intermediate surveys.

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 1.15.2*. The sampling method of thickness measurements is given in Annex 12 and Annex 13 of the IMO Resolution MSC.461 (101), for Single-Hull Oil Tankers and for Double –Hull Oil Tankers respectively.

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 Cargo tank testing carried out by the vessel's crew under the direction of the Master may be accepted by the surveyor provided the following conditions are complied with:
a) a tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, has been submitted by the owner and reviewed by the Society prior to the testing being carried out;
b) there is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank;
c) the tank testing has been satisfactorily carried out within special survey window not more than 3 months prior to the date of the survey on which the overall or close up survey is completed;
d) the satisfactory results of the testing is recorded in the vessel's logbook;
e) the internal and external condition of the tanks and associated structure are found satisfactory by the surveyor at the time of the overall and close up survey.

4.3.6.3 The Surveyor may extend the tank testing as deemed necessary.

4.3.6.4 Boundaries of ballast tanks should be tested with a head of liquid to the top of air pipes.

4.3.6.5 Boundaries of cargo tanks should be tested to the highest point that liquid will rise under service conditions.

4.3.6.6 The testing of double-bottom tanks and other spaces not designed for the carriage of liquid may be omitted, provided a satisfactory internal examination together with an examination of the tank top 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.

4.3.8 Fire fighting systems in cargo area

4.3.8.1 The survey is to include the examination of fire-fighting systems of any type fitted onboard for the protection of the cargo area, cargo pump room and other dangerous spaces, such as deck foam, water systems, etc., as applicable in accordance with the relevant requirements given.

4.3.9 Inert Gas system

4.3.9.1 In addition to the inspections required at the intermediate survey, the following is to be carried out :

a) an internal examination of :
   - the inert gas generator, where fitted
   - the scrubber
   - the deck water seal including the non-return valve
   - the pressure / vacuum breaking device
   - the cooling water systems including overboard discharge from the scrubber
   - all valves

b) a test to verify the proper operation of the system upon completion of all survey checks.

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	**(A)** All web frame rings in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast	**(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)	As for Special Survey III Additional transverse areas as deemed necessary by the Surveyor
(B) One deck transverse in a cargo tank	**(B)** One deck transverse: – In each of the remaining ballast tanks, if any – In a cargo wing tank – In 2 cargo centre tanks	**(C)** All transverse bulkheads in all cargo and ballast tanks	
(D) One transverse bulkhead: – In a ballast tank – In a cargo wing tank – In a cargo centre tank	**(C)** Both transverse bulkheads in a wing ballast tank, if any, or a cargo wing tank used primarily for water ballast	**(E)** A minimum of 30% of deck and bottom transverses including adjacent structural members in each cargo centre tank (see note 1)	
	(D) One transverse bulkhead: – In each remaining ballast tank – In a cargo wing tank – In 2 cargo centre tanks	**(F)** 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	
One transverse bulkhead (4), in a complete ballast tank *(see Note 1)*	One transverse bulkhead (4), in each complete ballast tank *(see Note 1)*	All transverse bulkheads, in all cargo oil (3) and ballast (4) tanks	
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 structural elements and cross ties, where fitted, including adjacent structural members.

Note 1:

Ballast tank: Apart from the fore and aft peak tanks, the term "ballast tank" has the following meaning:

1. all ballast compartments (hopper tank, side tank and double-deck tank, if separate from double-bottom tank) located on one side, i.e. portside or starboard side, and additionally double-bottom tank on portside plus starboard side, when the longitudinal central girder is not watertight and, therefore, the double-bottom tank is a unique compartment from portside to starboard side; or
2. all ballast compartments (double-bottom tank, hopper tank, side tank and double-deck tank) located on one side, i.e. portside or starboard side, when the longitudinal central girder is watertight and, therefore, the portside double-bottom tank separate from the starboard-side double-bottom tank."

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)	1. Within the cargo area: – Each deck plate – One transverse section	1. Within the cargo area: – Each deck plate. – Two transverse sections. (see Note 1) – All wind and water strakes	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	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	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	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	3. Suspect areas	3. Suspect areas	3. Suspect areas
	4. Selected wind and water strakes outside the cargo length	4. Selected wind and water strakes outside the cargo length	4. All wind and water strakes in full length

NOTES:
1. At least one section should include a ballast tank within 0.5L amidships

TABLE IV 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 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). For 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.	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 (if fitted).
3. Deck girders and brackets (usually in cargo tanks only)	At fore and aft transverse bulkhead bracket toes and in centre of tanks.	Vertical line of single measurements on web plating with 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
1. 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). For 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.

SECTION 5

Surveys of Chemical Tankers

The present section applies to all self-propelled Chemical Tankers with integral tanks i.e. vessels with IMO certificate of fitness for the carriage of dangerous chemicals in bulk. If a chemical tanker is constructed with both integral and independent tanks, these requirements are applicable only to that portion of the cargo length containing integral tanks. Combined gas carriers/chemical tankers with independent tanks within the hull, are to be surveyed as gas carriers.

The requirements indicated apply to surveys of hull structure and piping systems in way of cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area and all Ballast Tanks. The requirements are additional to the classification requirements applicable to the remainder of the ship. The requirements are not applicable for independent tanks on deck.

The requirements indicated contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when Substantial Corrosion and/or structural defects are found and include additional Close-up Survey when necessary.

5.1 Annual Survey

5.1.1 Schedule

5.1.1.1 Annual Surveys are to be held within 3 months before or after anniversary date from the date of the initial classification survey or of the date credited for the last Special Survey.

5.1.2 Scope

5.1.2.1 The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, piping and machinery 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.

5.1.3 Examination of the Hull

5.1.3.1 Examination of the hull plating and its closing appliances as far as can be seen.

5.1.3.2 Examination of watertight penetrations as far as practicable.

5.1.4 Weather decks

5.1.4.1 Examination of cargo tank openings including gaskets, covers, coamings and flame screens.

5.1.4.2 Examination of cargo tanks pressure/vacuum valves and flame screens.

5.1.4.3 Examination of flame screens on vents to all bunker tanks.

5.1.4.4 Examination of cargo, bunker and vent piping systems, including vent masts and headers.

5.1.5 Cargo pump rooms and pipe tunnels if fitted

5.1.5.1 Examination of all pump room bulkheads for signs of chemical leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room bulkheads.

5.1.5.2 Examination of the condition of all piping systems.

5.1.6 Ballast Tanks

5.1.6.1 Examination of Ballast Tanks where required as a consequence of the results of the Special Survey and Intermediate Survey is to be carried out.

5.1.6.2 When considered necessary by the surveyor, or when extensive corrosion exists, thickness measurements are to be carried out and if the results of these thickness measurements indicate that Substantial Corrosion is found, the extent of thickness measurements is to be increased in accordance with Table IV. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect Areas identified at previous Surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

5.1.7 Machinery items of Cargo areas and Cargo pump rooms

The survey is to include:

a) Confirmation that potential sources of ignition in or near the cargo pump rooms, such as loose gear, excessive product in bilge, excessive vapours, combustible materials, etc., are eliminated and that access ladders are in satisfactory condition.
b) 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 the pump room bilge system, and checking that pump foundations are intact.
c) Confirmation that the ventilation system, including portable equipment, if any, of all spaces in the cargo area (including cargo pump rooms) is operational, ducting is intact, dampers are operational and screens are clean.
d) Confirmation that electrical equipment in dangerous zones, cargo pump rooms and other spaces is in satisfactory condition and has been properly maintained.
e) Confirmation that the remote operation of the cargo pump room bilge system is satisfactory.
f) Confirmation that cargo pump room rescue arrangements are in order.
g) Confirmation that removable pipe lengths or other approved equipment necessary for cargo separation are available and in satisfactory condition.
h) Examination of the cargo heating/cooling system and sampling arrangements where required.
i) Examination of the cargo-transfer arrangement and confirmation that the ship's cargo hoses are suitable for their intended purpose and in satisfactory condition and, where appropriate, type approved or marked with date of testing.
j) Confirmation that any special arrangement made for bow or stern loading/unloading is in satisfactory condition and test of the means of communications and the remote shutdown for the cargo pumps.
k) Confirmation that, if applicable, the provisions made for chemical products which have special requirements are satisfactory.

5.1.8 Instrumentation and safety devices

5.1.8.1 The survey is to include the following items, as far as required or fitted:

a) Confirmation that installed pressure gauges on cargo discharge lines are properly operational.
b) Examination of gauging devices, high level alarms and valves associated with overflow control.
c) Confirmation that devices provided for measuring the temperature of the cargo and associated alarms operate satisfactorily.
d) Confirmation that the required gas detection instruments are on board and satisfactory arrangements have been made for the supply of any required vapour detection tubes.

5.1.9 Fire-fighting systems in cargo area

5.1.9.1 The survey is to include:

a) External examination of piping and cut-out valves of fixed fire-fighting systems related to cargo tanks and cargo pump rooms.
b) Confirmation, as far as practicable and when appropriate, that the remote means for closing the various openings are operable.
c) Examination of the appropriate portable fire-extinguishing equipment for the chemical cargoes to be carried in accordance with the relevant requirements.
d) Examination of fire-fighting systems of any type fitted on board such as deck foam, water-spraying, etc. as applicable in accordance with the relevant requirements.

5.1.10 Inert gas systems

5.1.10.1 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.
e) Checking, when practicable, of the proper operation of the inert gas system.

5.2 Intermediate survey

5.2.1 Schedule

5.2.1.1 The Intermediate Survey is to be held at or between either the 2nd or 3rd Annual Survey.

5.2.1.2 The following requirements which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

5.2.2 Scope

5.2.2.1 The survey extent is dependent on the age of the vessel as specified in 5.2.3 to 5.2.5

5.2.2.2 For weather decks, an examination as far as applicable of cargo, 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.

5.2.3 Chemical Tankers between 5 and 10 Years of Age

The following is to apply:

5.2.3.1 For ballast tanks, an Overall Survey of representative Tanks selected by the Surveyor is to be carried out. If such inspections reveal no visible structural defects, the examination may be limited to a verification that the hard protective coating remains in GOOD condition.

5.2.3.2 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.

5.2.3.3 In addition to the requirements above, suspect areas identified at previous surveys are to be examined.

5.2.4 Chemical Tankers between 10 and 15 years of Age

The following is to apply:

5.2.4.1 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 is not required unless deemed necessary by the attending Surveyor.

5.2.4.2 In application of 5.2.4.1, 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.

5.2.4.3 In application of 5.2.4.1, an under water survey may be considered in lieu of the requirements for Dry-Docking survey.

5.2.5 Chemical Tankers over 15 years of Age

The following is to apply:

5.2.5.1 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 is not required unless deemed necessary by the attending Surveyor.

5.2.5.2 In application of 5.2.5.1, 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.

5.2.5.3 In application of 5.2.5.1, a survey in dry dock is to be part of the intermediate survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and water ballast tanks are to be carried out in accordance with the applicable requirements for intermediate surveys, if not already performed.

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

5.2.6 Machinery items of cargo area and cargo pump rooms

5.2.6.1 The survey is to include :

a) 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 defective and non-certified safe type electrical equipment, non-approved lighting and fixtures, and improperly installed or defective or dead-end wiring.
b) The electrical insulation resistance of the electrical equipment and circuits terminating in or passing through the dangerous zones is to be tested; however, in cases where a proper record of testing is maintained, consideration may be given to accepting recent test readings effected by the ship's personnel.
c) The satisfactory condition of the cargo heating/cooling system is to be verified.
d) The spares for cargo area mechanical ventilation fans are to be available on board.

5.2.7 Inert gas system

5.2.7.1 The following is to be carried out :

a) Main parts such as the scrubber, washing machines, blowers, deck water seal and non-return valve are to be opened out as considered necessary and examined.
b) Gas distribution lines and shut-off valves, including soot blower interlocking devices, are to be examined as deemed necessary.
c) All automatic shutdown devices and alarms are to be examined and tested.

5.2.8 Personnel protection

5.2.8.1 The survey is to include:

a) Confirmation that the protective clothing for crew engaged in loading and discharging operations and its towage is in satisfactory condition.
b) Confirmation that the required safety equipment and associated breathing apparatus and associated air supplies and, when appropriate, emergency escape respiratory and eye protection are in a satisfactory condition and properly stowed.
c) Confirmation that the medical first-aid equipment, including stretchers and oxygen resuscitation equipment are in a satisfactory condition.
d) Confirmation that arrangements have been made for the antidotes for the cargoes actually carried to be on board.
e) Confirmation that decontamination arrangements and eyewashes are operational.
f) Confirmation that the required gas detection instruments are on board and that arrangements have been made for the supply of the appropriate vapour detection tubes.
g) Confirmation that the arrangements for the stowage of cargo samples are satisfactory .

5.3 Special survey

5.3.1 Schedule

5.3.1.1 Special Surveys are to be carried out at 5 years intervals to renew the Classification Certificate.

5.3.1.2 The first Special Survey is to be completed within 5 years from the date of the initial classification survey and thereafter within 5 years from the credited date of the previous Special Survey. However, an extension of class of 3 months maximum beyond the 5th year can be granted in 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.

5.3.1.3 For surveys completed within 3 months before the expiry date of the Special Survey, the next period of class will start from the expiry date of the Special Survey. For surveys completed more than 3 months before the expiry date of the Special Survey, the period of class will start from the survey completion date. In cases where the vessel has been laid up or has been out of service for a considerable period because of a major repair or modification and the owner elects to only carry out the overdue surveys, the next period of class will start from the expiry date of the special survey. If the owner elects to carry out the next due special survey, the period of class will start from the survey completion date.

5.3.1.4 The Special Survey may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date. When the Special Survey is commenced prior to the 4th Annual Survey, the entire survey is to be completed within 15 months if such work is to be credited to the Special Survey.

5.3.1.5 The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in 5.3.1.7, 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.

5.3.1.6 All cargo tanks, Ballast Tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in 5.3.5 and 5.3.6, 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.

5.3.1.7 Cargo piping on deck and cargo and ballast piping within the above tanks and spaces are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory. Special attention is to be given to any ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces, and Surveyors are to be advised on all occasions when this piping, including valves and fittings are open during repair periods and can be examined internally.

5.3.2 Dry Dock Survey

5.3.2.1 A survey in dry dock is to be a part of the Special Survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo tanks and ballast tanks are to be carried out in accordance with the applicable requirements for special surveys, if not already performed.

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

5.3.3 Tank Protection

5.3.3.1 Where provided, the condition of the corrosion prevention system of cargo tanks is to be examined.
A Ballast Tank is to be examined at subsequent annual intervals where:

a) 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 measurements are to be carried out as deemed necessary by the surveyor.

5.3.4 Extent of Overall and Close-up Survey

5.3.4.1 An Overall Survey of all tanks and spaces is to be carried out at each Special Survey.

5.3.4.2 The minimum requirements for Close-up Surveys at Special Survey are given in Table I. The survey of stainless steel tanks may be carried out as an overall survey supplemented by Close-up Survey as deemed necessary by the surveyor.

5.3.4.3 The Surveyor may extend the Close-up Survey as deemed necessary taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

a) In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.
b) In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

5.3.4.4 For areas in tanks 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.

5.3.5 Extent of Thickness Measurement

5.3.5.1 The minimum requirements for thickness measurements at Special Survey are given in Table II. Thickness measurement of stainless steel hull structure and piping may be waived, except for clad steel plating.

5.3.5.2 Provisions for extended measurements for areas with Substantial Corrosion are given in Table IV, and as may be additionally specified in the Survey Programme as required in Sec.1 Sub 1.5. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect Areas identified at previous Special Surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

5.3.5.3 The Surveyor may further extend the thickness measurements as deemed necessary.

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

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

5.3.5.6 In cases where two or three sections are to be measured, at least one is to include a Ballast Tank within 0.5L amidships.

5.3.6 Extent of Tank Testing

5.3.6.1 The minimum requirements for ballast tank testing at Special Survey are given in Table III. The minimum requirements for cargo tank testing at Special Survey are given in Table III. Cargo tank testing carried out by the vessel's crew under the direction of the Master may be accepted by the surveyor provided the following conditions are complied with:

a) A tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, has been submitted by the owner and reviewed by the Society prior to the testing being carried out;
c) There is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank;
d) The tank testing has been satisfactorily carried out within special survey window not more than 3 months prior to the date of the survey on which the overall or close up survey is completed;
e) The satisfactory results of the testing is recorded in the vessel's logbook;
f) The internal and external condition of the tanks and associated structure are found satisfactory by the surveyor at the time of the overall and close up survey.

5.3.6.2 The Surveyor may extend the tank testing as deemed necessary.

5.3.6.3 Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.

5.3.6.4 Boundaries of cargo tanks are to be tested to the highest point that liquid will rise under service conditions.

5.3.6.5 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.

5.3.7 Chemical Tankers over 10 Years of Age

5.3.7.1. Selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks are to be:
- Thickness measured at random or selected pipe lengths to be opened for internal inspection;
- Pressure tested to the maximum working pressure.

Special attention is to be given to cargo/slop discharge piping through Ballast Tanks and void spaces.

5.3.8 Mmachinery items of cargo area and cargo pump rooms

a) Ballast and stripping pumps are to be internally examined and prime movers checked. A working test is to be carried out. Maintenance records of cargo pumps are to be made available to the Surveyor.
b) Where a washing system is fitted, piping, 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.
c) The satisfactory condition of the cargo heating/cooling system is to be verified and, if deemed necessary by the Surveyor, the system is to be pressure tested.
d) Spares for cargo area mechanical ventilation fans are to be available on board.
e) Heat exchangers and anti-sparking fans are to be examined.
f) An operating test of the remote control of pumps and valves and of automatic closing valves is to be carried out.
g) 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 defective and non-certified safe type electrical equipment, non-approved lighting and fixtures, and improperly installed or defective or dead-end wiring.
h) The electrical insulation resistance of the electrical equipment and circuits terminating in or passing through the dangerous zones is to be tested; however, in cases where a proper record of testing is maintained, consideration may be given to accepting recent test readings effected by the ship's personnel.

5.3.9 Fire-fighting systems in cargo area

5.3.9.1 The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the cargo area, cargo pump room and other dangerous spaces, such as deck foam, water-spraying and dry powder systems, as applicable in accordance with the relevant requirements.

5.3.10. Inert gas system

5.3.10.1 In addition to the inspections required at the intermediate survey, the following are to be carried out:

a) An internal examination of :
   - the inert gas generator, where fitted
   - the scrubber
   - the deck water seal including the non-return valve
   - the pressure / vacuum breaking device
   - the cooling water systems including overboard discharge from the scrubber
   - all valves
b) A test to verify the proper operation of the system upon completion of all survey checks.

TABLE I.1

MINIMUM REQUIREMENTS FOR CLOSE-UP SURVEY AT SPECIAL SURVEY OF SINGLE SKIN CHEMICAL TANKERS

Special Survey No.1 age < 5	Special Survey No.2 5< age < 10	Special Survey No.3 10 < age < 15	Special Survey No.4 and Subsequent: age > 15
A ONE WEB FRAME RING - in a ballast wing tank	**A** ALL WEB FRAME RINGS - in a ballast wing tank or double bottom ballast tank (see Note I)	**A** ALL WEB FRAME RINGS - in all ballast tanks	As special survey No.3
B ONE DECK TRANSVERSE - in a cargo tank or on deck	**B** ONE DECK TRANSVERSE - in each remaining ballast tank or on deck **B** ONE DECK TRANSVERSE - in a cargo wing tank or on deck	**A** ALL WEB FRAME RINGS - in a cargo wing tank	Additional transverseareas as deemed necessary by the Society
D ONE TRANSVERSE BULKHEAD - lower part in a ballast tank	**B** ONE DECK TRANSVERSE - in two cargo centre tanks or on deck	**A** ONE WEB FRAME RING - in each remaining cargo tank	
D ONE TRANSVERSE BULKHEAD - lower part in a cargo wing tank	**C** BOTH TRANSVERSE BULKHEADS - in a ballast wing tank	**C** ALL TRANSVERSE BULKHEADS - in all cargo tanks	
D ONE TRANSVERSE BULKHEAD - lower part in a cargo centre tank (see Note II)	**D** ONE TRANSVERSE BULKHEAD - lower part in each remaining ballast tank **D** ONE TRANSVERSE BULKHEAD - lower part in two cargo centre tanks (see Note II) **D** ONE TRANSVERSE BULKHEAD - lower part in a cargo wing tank	**C** ALL TRANSVERSE BULKHEADS - in all ballast tanks	

Note I: Ballast double hull tank: means double bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.

Note II: Where no centre cargo tanks are fitted (as in case of centre longitudinal bulkhead), transverse bulkheadsin wing tanks are to be surveyed.

A-D: are areas to be subjected to close-up surveys and thickness measurements (see Fig. 2.1 and 2.2).

A) Complete transverse web frame ring including adjacent structural members.
B) Deck transverse including adjacent deck structural members.
C) Transverse bulkhead complete - including girder system and adjacent structural members.
D) Transverse bulkhead lower part - including girder system and adjacent structural members.

TABLE I.2

MINIMUM REQUIREMENTS FOR CLOSE-UP SURVEY AT SPECIAL SURVEY OF DOUBLE SKIN CHEMICAL TANKERS

Special Survey No.1 age < 5	Special Survey No.2 5 < age < 10	Special Survey No.3 10 < age < 15	Special Survey No.4 and Subsequent: age > 15
(1) ONE WEB FRAME RING - in a ballast double hull tank (see Note I)	**(1)** ALL WEB FRAME RINGS - in a ballast wing tank or ballast double hull tank (see Note I)	**(1)** ALL WEB FRAME RINGS - in all ballast tanks	As special survey No.3
(2) ONE DECK TRANSVERSE - in a cargo tank or on deck	**(6)** THE KNUCKLE AREA AND THE UPPER PART (3 metres approx) of one web frame in each remaining ballast tank	**(7)** ALL WEB FRAME RINGS - in a cargo wing tank	Additional transverse areas as deemed necessary by the Society
(4) ONE TRANSVERSE BULKHEAD - in a ballast tank (see Note I)		**(7)** ONE WEB FRAME RING - in each remaining cargo tank	
(5) ONE TRANSVERSE BULKHEAD - in a cargo wing tank	**(2)** ONE DECK TRANSVERSE - in two cargo tanks	**(3)** ALL TRANSVERSE BULKHEADS - in all cargo tanks	
(5) ONE TRANSVERSE BULKHEAD - in a cargo centre tank (see Note II)	**(4)** ONE TRANSVERSE BULKHEAD - in each ballast tank (see Note I)	**(4)** ALL TRANSVERSE BULKHEADS - in all ballast tanks	
	(5) ONE TRANSVERSE BULKHEAD - in two cargo centre tanks (see Note II)		
	(5) ONE TRANSVERSE BULKHEAD - in a cargo wing Tank		

(1), (2), (3), (4), (5), (6) and **(7)** are areas to be subjected to close-up surveys and thickness measurements (see Figures 2.1 - 2.3).

(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 foreand 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, connectingbrackets.

(5) : Transverse bulkhead lower part in cargo tank, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower stool, where fitted.

(6) : The *knuckle area* and the upper part (3 metres approximately), including adjacent structural members. *Knuckle area* is the area of the web frame around the connections of the slope hopper plating to the inner hullbulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.

(7) : Web frame in a cargo tank means deck transverse, longitudinal bulkhead structural elements and cross ties, where fitted, including adjacent structural members.

Note I: Ballast double hull tank: means double bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.

Note II: Where no centre cargo tanks are fitted (as in the case of centre longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.

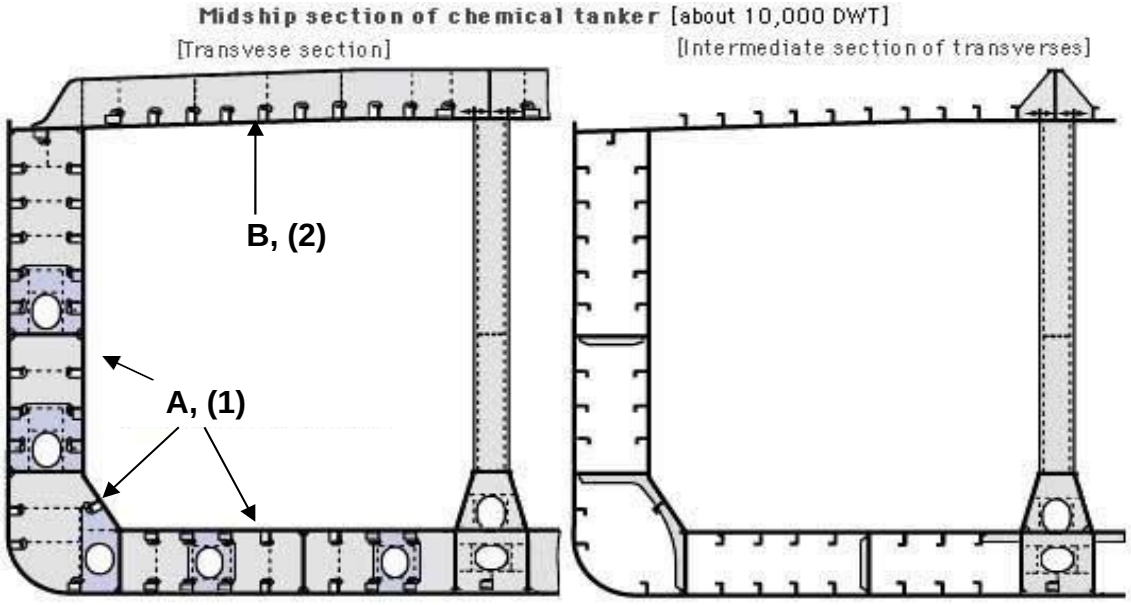


Fig. 2.1 Representative transverse section of chemical tanker. Areas A & B and 1 and 2

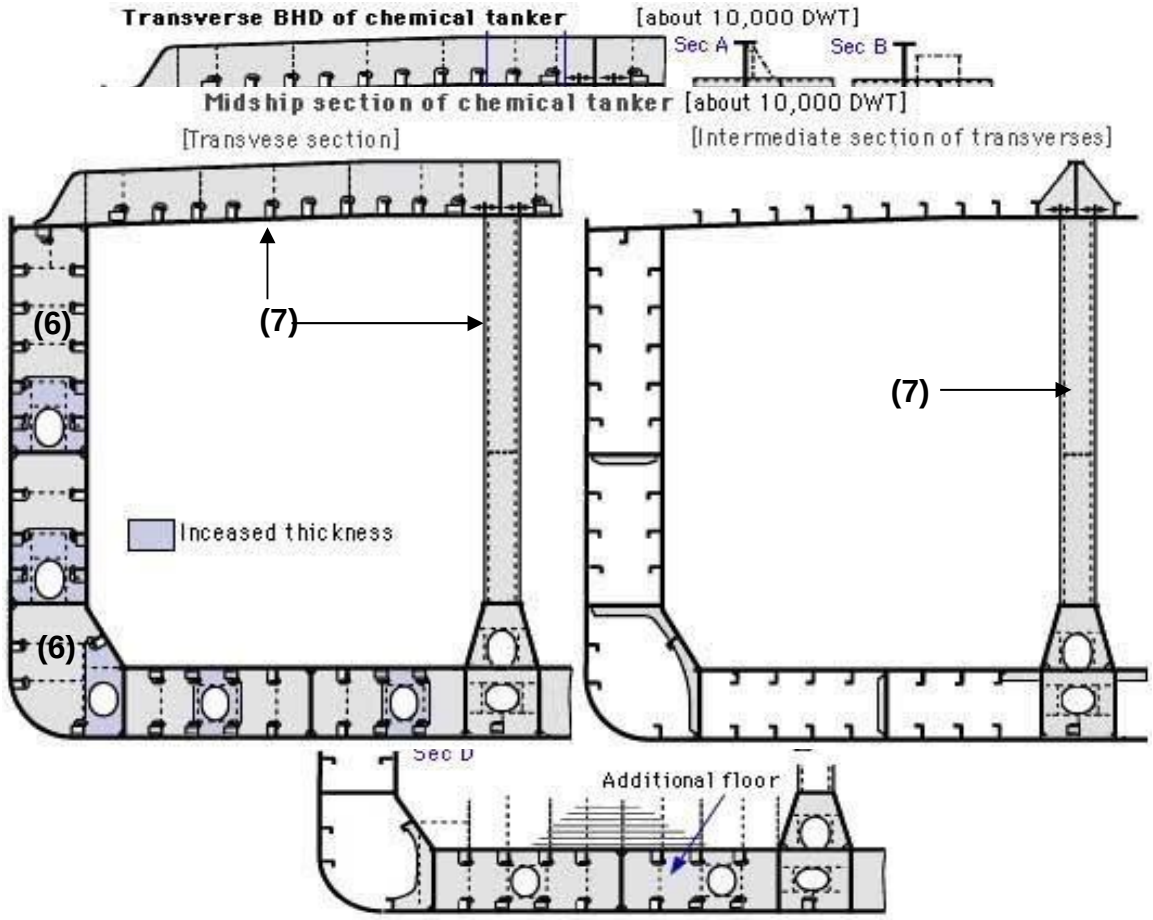


Fig. 2.2 Representative transverse section of chemical tanker. Areas C & D and 3, 4 and 5

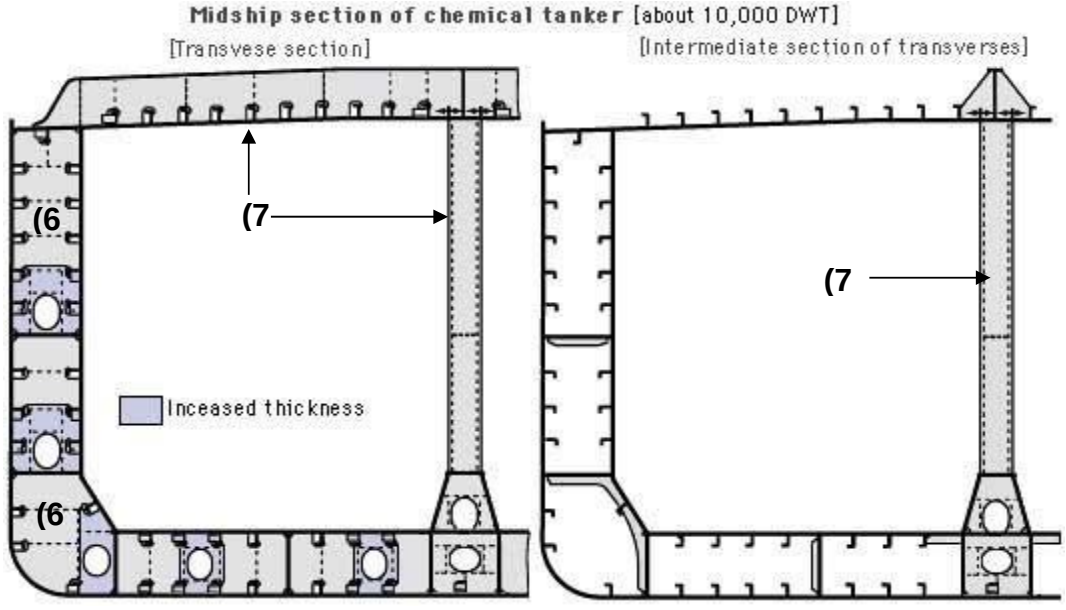


Fig. 2.3 Representative transverse section of chemical tanker. Areas 6 and 7

TABLE II

MINIMUM REQUIREMENTS FOR THICKNESS MEASUREMENTS AT SPECIAL SURVEY OF CHEMICAL TANKERS

Special Survey No.1 age < 5	**Special Survey No.2 5 < age ≤ 10**	**Special Survey No.3 10 < age ≤ 15**	**Special Survey No.4 and Subsequent age > 15**
1. Suspect areas	1. Suspect areas	1. Suspect areas	1. Suspect areas
2. One section of deck plating for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast)	2. Within the cargo area: .1 Each deck plate .2 One transverse section	2. Within the cargo area: .1 Each deck plate .2 Two transverse sections (1) .3 All wind and waterstrakes	2. Within the cargo area: .1 Each deck plate .2 Three transverse Sections (1) .3 Each bottom plate
	3. Selected wind and water strakes outside the cargo area	3. Selected wind and water strakes outsidethe cargo area	3. All wind and water strakes, full length
4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I.1 or I.2, as applicable.	4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I.1 or I.2, as applicable.	4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I.1 or I.2, as applicable.	4. Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I.1 or I.2, as applicable.

(1): at least one section is to include a ballast tank within 0.5L amidships.

TABLE III

MINIMUM REQUIREMENTS FOR TANK TESTING AT SPECIAL SURVEY OF CHEMICAL TANKERS	
Special Survey No.1 age ≤ 5	**Special Survey No.2 and Subsequent age > 5**
All ballast tank boundaries	All ballast tank boundaries
Cargo tank boundaries facing ballast tanks,void spaces, pipe tunnels, pump rooms or cofferdams	All cargo tank bulkheads

TABLE IV/ Sheet 1

REQUIREMENTS FOR EXTENT OF THICKNESS MEASUREMENTS AT THOSE AREAS OF SUBSTANTIAL CORROSION. SPECIAL SURVEY OF CHEMICAL TANKERS WITHIN THE CARGO AREA LENGTH

BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE		
Structural member	**Extent of measurement**	**Pattern of measurement**
Bottom, inner bottom andhopper structure plating	Minimum of three bays across tank, including aft bay Measurements around and under all suction bell mouths	5-point pattern for each panel between longitudinals and floors
Bottom, inner bottom and hopper structure longitudinals	Minimum of three longitudinals in each bay where bottom plating measured	Three meaurements in lineacross the flange and three measurements on verticalweb
Bottom girders, including thewatertight 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. Two measurements acrossface flat where fitted.
Bottom floors, including thewatertight ones	Three floors in bays where bottom plating measured, with measurements at both ends and middle	5-point pattern over two square metre area
Hopper structure web framering	Three floors in bays where bottom plating measured	5-point pattern over one square metre of plating. Single measurements onflange
Hopper structure transverse watertight bulkhead or swashbulkhead	- lower 1/3 of bulkhead	- 5-point pattern over one square metre of plating
	- upper 2/3 of bulkhead	- 5-point pattern over two square metre of plating
	- stiffeners (minimum of three)	- For web, 5-point pattern over span (two measurements across webat each end and one at centre of span). For flange,single measurements at each end and centre of span
Panel stiffening	Where applicable	Single measurements

TABLE IV/ Sheet 2

REQUIREMENTS FOR EXTENT OF THICKNESS MEASUREMENTS AT THOSE AREAS OF SUBSTANTIAL CORROSION. SPECIAL SURVEY OF CHEMICAL TANKERS WITHIN THE CARGO AREA LENGTH

DECK STRUCTURE		
Structural member	**Extent of measurement**	**Pattern of measurement**
Deck plating	Two transverse bands acrosstank	Minimum of three measurements per plate perband
Deck longitudinals	Every third longitudinal in each of two bands with a minimum of one longitudinal	Three measurements in line vertically on webs and two measurements on flange (if fitted)
Deck girders and brackets	At fore and aft transverse bulkhead, bracket toes and incentre of tanks	Vertical line of single measurements on web platingwith one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across flange. 5-point pattern on girder/bulkhead brackets
Deck transverse webs	Minimum of two webs, with measurements at both endsand middle of span	5-point pattern over one square metre area. Single measurements on flange
Vertical web and transversebulkhead in wing ballast tank for double hull design (two metres from deck)	Minimum of two webs, andboth transverse bulkheads	5-point pattern over one square metre area
Panel stiffening	Where applicable	Single measurements

TABLE IV/ Sheet 3

REQUIREMENTS FOR EXTENT OF THICKNESS MEASUREMENTS AT THOSE AREAS OF SUBSTANTIAL CORROSION. SPECIAL SURVEY OF CHEMICAL TANKERS WITHIN THE CARGO AREA LENGTH

SIDE SHELL AND LONGITUDINAL BULKHEADS		
Structural member	**Extent of measurement**	**Pattern of measurement**
Side shell and longitudinalbulkhead plating: - Deckhead and bottom strakes, and strakes in wayof horizontal girders - All other strakes	- Plating between each pair of longitidinals in a minimum of three bays (along the tank) - Plating between every third pair of longitudinals in same three bays	Single measurement
Side shell and longitudinalbulkhead longitudinals on: - Deckhead and bottomstrakes - All other strakes	- Each longitudinal in same three bays - Every third longitudinal in same three bays	3 measurements across web and 1 measurement on flange
Longitudinals - brackets	Minimum of three at top, middle and bottom of tank in same three bays	5-point pattern over area of bracket
Vertical web and transverse bulkheads of double side tanks(excluding deck area): - Strakes in way of horizontalgirders - Other strakes	- Minimum of two webs and both transverse bulkheads - Minimum of two webs and both transverse bulkheads	- 5-point pattern over approx. two square metre area - Two measurements between each pair of vertical stiffeners
Web frames and cross ties forother tanks than double side tanks	Three webs with minimumof three locations on eachweb, including in way of cross tie connections and lower end bracket	5-point pattern over approximately two square metre area of webs, plus single measurements on flanges of web frame and cross ties
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 IV/ Sheet 4

REQUIREMENTS FOR EXTENT OF THICKNESS MEASUREMENTS AT THOSE AREAS OF SUBSTANTIAL CORROSION. SPECIAL SURVEY OF CHEMICAL TANKERS WITHIN THE CARGO AREA LENGTH

TRANSVERSE WATERTIGHT AND SWASH BULKHEADS		
Structural member	**Extent of measurement**	**Pattern of measurement**
Upper and lower stool, wherefitted	- Transverse band within 25mm of welded connection to inner bottom/deck plating - Transverse band within 25mm of welded connection to shelf plate	5-point pattern between stiffeners over one metre length
Deckhead and bottom strakes, and strakes in way of horizontal stringers	Plating between pair of stiffeners at three locations: approximately 1/4, 1/2 and 3/4 width of tank	5-point pattern between stiffeners over one metre length
All other strakes	Plating between pair of stiffeners at middle location	Single measurement
Strakes in corrugatedbulkheads	Plating for each change of scantling at centre of paneland at flange of fabricated connection	5-point pattern over about one square metre of plating
Stiffeners	Minimum of three typical stiffeners	For web, 5-point pattern overspan between bracket connections (two measurements across web ateach bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	5-point pattern over area of bracket
Horizontal stringers	All stringers with measurements at both endsand middle.	5-point pattern over one square metre area, plus single measurements near bracket toes and on flanges
Deep webs and girders	Measurements at toe of bracket and at centre of span	For web, 5 point pattern overabout 1 square metre. 3 measurements across faceflat.

SECTION 6

Surveys of Liquefied Gas Carriers

The present section applies to all self-propelled ships carrying liquefied gases in bulk.

The requirements apply to surveys of hull structure and piping systems, , in way of pump rooms, compressor rooms, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo area and all ballast tanks.

The requirements are additional to the classification requirements applicable to the remainder of the ship.

The requirements contain the minimum extent of examination, thickness measurements and tank testing. The survey is to be extended when Substantial Corrosion and/or structural defects are found and include additional Close-up Survey when necessary.

6.1 Annual Survey

6.1.1. Schedule

6.1.1.1 Annual Surveys are to be held within 3 months before or after anniversary date from the date of the initial classification survey or of the date credited for the last Special Survey.

6.1.2 Scope

6.1.2.1 General

6.1.2.1 The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition.

6.1.3 Examination of the hull

6.1.3.1 Examination of the hull plating and its closing appliances as far as can be seen.

6.1.3.2 Examination of watertight penetrations as far as practicable.

6.1.4 Weather decks

6.1.4.1 Examination of flame screens on vents to all bunker tanks.

6.1.4.2 Examination of bunker and vent piping systems.

6.1.5 Cargo pump rooms and compressor rooms and, as far as practicable, pipe tunnels if fitted.

6.1.5.1 Examination of all pump room and compressor room bulkheads for signs of leakage or fractures and, in particular, the sealing arrangements of all penetrations of pump room and compressor room bulkheads.

6.1.5.2 Examination of the condition of all piping systems.

6.1.6. Suspect Areas

6.1.6.1 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 may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

6.1.7 Examination of ballast tanks

6.1.7.1 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 may 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.

6.1.8 Cargo Installations

6.1.8.1 **General**

a) The log books are to be examined with regard to correct functioning of the cargo containment and cargo handling systems. The hours per day of the reliquefaction plants or the boil-off rate is to be considered.
b) All accessible gas-tight bulkhead penetrations including gas-tight shaft sealings are to be visually examined.
c) The means for accomplishing gas tightness of the wheelhouse doors and windows is to be examined. All windows and side scuttles within the area required to be of the fixed type (non-opening) are to be examined for gas tightness. The closing devices for all air intakes and openings into accommodation spaces, service spaces, machinery spaces, control stations and approved openings in superstructures and deckhouses facing the cargo area

or bow and stern loading/unloading arrangements, are to be examined.

6.1.8.2 Cargo handling systems

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

6.1.8.3 Cargo containment venting systems

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

6.1.8.4 Instrumentation and safety systems

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

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

6.1.8.5 Environmental control for cargo containment systems

a) Inert gas/dry air installations including the means for prevention of backflow of cargo vapour to gas-safe spaces are to be verified as being in satisfactory operating condition.
b) For membrane containment systems normal operation of the nitrogen control system for insulation and interbarrier spaces shall be confirmed to the Surveyor by the Master.
c) In the case of low temperature liquid nitrogen storage, the plant and its associated arrangements for protecting the hull structure against liquid niotrgen leakage are to be examined.

6.1.8.6 Miscellaneous

a) It is to be verified that all accessible cargo piping systems are electrically bonded to the hull.
b) Arrangements for burning methane boil-off are to be visually examined as far as practicable. The instrumentation and safety systems are to be verified as being in good working order.
c) The relevant instruction and information material such as cargo handling plans, filling limit information, cooling down procedures, etc. are to be verified as being onboard.
d) Mechanical ventilation fans in gas dangerous spaces and zones are to be visually examined.

6.1.9 Fire-fighting systems in cargo area

The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the cargo area, cargo pump room, cargo compressor room and other dangerous spaces, such as deck foam, water spraying and dry powder systems, as applicable in accordance with the relevant requirements.

6.2 Intermediate survey

6.2.1 Schedule

6.2.1.1 The Intermediate Survey is to be held at or between either the 2nd or 3rd Annual Survey.

6.2.1.2 Those items which are additional to the requirements of the Annual Surveys may be surveyed either at or between the 2nd and 3rd Annual Survey.

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

6.2.2 Scope

6.2.2.1 The scope of the second or third annual survey is to be extended to include the following:

6.2.2.2 Ballast tanks

6.2.2.2.1 For ships between 5 and 10 years of age, an overall survey of representative ballast tanks is to be carried out. If there is no hard protective coati ng, soft or semi-hard coating or POOR coating condition, the examination is to be extended to other ballast tanks of the same type.

6.2.2.2.2 For ships over 10 years of age, an overall survey of all ballast tanks is to be carried out.

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

6.2.2.2.4 For ballast tanks, excluding double bottom tanks, if there is no hard protective coating, soft or semi-hard

coating, or POOR coating condition and it is not renewed, the tanks in question are to be internally examined at annual intervals.

6.2.2.2.5 When such conditions are found in double bottom ballast tanks, the tanks in question may be internally examined at annual intervals.

6.2.2.2.6 The minimum requirements for close-up surveys at intermediate survey are given in Table III.

6.2.3 Cargo Installations

The requirements of section 6.18 apply with the following additions:

6.2.3.1 Instrumentation and safety systems

a) The instrumentation of the cargo installation with regard to pressure, temperature and liquid level is to be visually examined and to be tested by changing the pressure, temperature and level as applicable and comparing with test instruments. Simulated testing may be accepted for sensors which are not accessible or for sensors located within cargo tanks or inerted hold spaces. The testing is to include testing of alarm and safety functions.
b) The piping of the gas detection system is to be visually inspected for corrosion and damage as far as practicable. The integrity of the suction lines between suction points and analyzing units is to be verified as far as possible. Gas Detectors are to be calibrated or verified with sample gases.
c) The emergency shutdown system is to be tested, without flow in the pipe lines, to verify that the system will cause the cargo pumps and compressors to stop.

6.2.3.2 Electrical equipment

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

- Protective earthing (Spot check).
- Integrity of enclosures.
- Damage of outer sheath of cables.
- Function testing of pressurized equipment and of associated alarms.
- Testing of systems for de-energizing non-certified safe electrical equipment located in spaces protected by air-locks, such as electrical motor-rooms, cargo control rooms, etc.
- Testing of insulation resistance of circuits. Such measurements are only to be made when the ship is in a gas-free or inerted condition. Where proper records of testing are maintained consideration may be given to accepting recent readings by the ship's crew.

6.2.3.3 Miscellaneous

The instrumentation and safety systems for burning cargo as fuel are to be examined in accordance with the requirements of 6.2.3.1 (a).

6.3 Special Survey

6.3.1 Schedule

6.3.1.1 Special Surveys are to be carried out at 5 years intervals to renew the Classification Certificate.

6.3.1.2 The first Special Survey is to be completed within 5 years from the date of the initial classification survey and thereafter within 5 years from the credited date of the previous Special Survey. However, an extension of class of 3 months maximum beyond the 5th year can be granted in 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.

6.3.1.3 For surveys completed within 3 months before the expiry date of the Special Survey, the next period of class will start from the expiry date of the Special Survey. For surveys completed more than 3 months before the expiry date of the Special Survey, the period of class will start from the survey completion date. In cases where the vessel has been laid up or has been out of service for a considerable period because of a major repair or modification and the owner elects to only carry out the overdue surveys, the next period of class will start from the expiry date of the special survey. If the owner elects to carry out the next due special survey, the period of class will start from the survey completion date.

6.3.1.4 The Special Survey may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date. When the Special Survey is commenced prior to the 4th Annual Survey, the entire survey is to be completed within 15 months if such work is to be credited to the Special Survey.

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

6.3.1.6 The Special Survey is to include, in addition to the requirements of the Annual Surveys, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in 6.3.1.8 , are in a satisfactory condition and fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

6.3.1.7 Ballast tanks, including double bottom tanks, pump rooms, compressor rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in 6.3.5 and 6.3.6, 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.

6.3.1.8 All piping systems within the above spaces, are to be examined and operationally tested to working pressure to attending Surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

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

6.3.2 Dry Dock Survey

6.3.2.1 A survey in dry dock is to be a part of the Special Survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the ballast tanks are to be carried out in accordance with the applicable requirements for special surveys, if not already performed.

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

6.3.3 Tank Protection

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

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

6.3.4 Extent of Overall and Close-up Survey

6.3.4.1 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. For fuel oil, lube oil and fresh water tanks, reference is made to Chapter 3.

6.3.4.2 The minimum requirements for close-up surveys at special survey are given in Table I.

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

6.3.4.4 For areas in tanks 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.

6.3.5 Extent of Thickness Measurement

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

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

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

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

6.3.6 Extent of Tank Testing

6.3.6.1 All boundaries of ballast tanks and deep tanks used for water ballast within the cargo area are to be pressure tested. For fuel oil tanks, the representative tanks are to be pressure tested.

6.3.6.2 The Surveyor may extend the tank testing as deemed necessary.

6.3.6.3 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.

6.3.7 Cargo Installations

The requirements of Section 6.2.3 apply with the following additions:

6.3.7.1 Cargo containment survey

a) All cargo tanks are to be examined internally.
b) Special attention is to be given to the cargo tank and insulation in way of chocks, supports and keys. Removal of insulation may be required in order to verify the condition of the tank or the insulation itself if found necessary by the Surveyor.
c) Where the arrangement is such that the insulation cannot be examined, the surrounding structures of wing tanks, double bottom tanks and cofferdams are to be examined for cold spots when the cargo tanks are in the cold condition unless voyage records together with the instrumentation give sufficient evidence of the integrity of the insulation system.
d) Non-destructive testing:
Non-destructive testing is to supplement cargo tank inspection with special attention to be given to the integrity of the main structural members, tank shell and highly stressed parts, including welded connections as deemed necessary by the surveyor. However, for type C tanks, this does not mean that non-destructive testing can be dispensed with totally.

The following items are, inter alia, considered as highly stressed parts:
- cargo tanks supports and anti-rolling/anti-pitching devices,
- web frames or stiffening rings,
- swash bulkhead boundaries,
- dome and stump connections to tank shell,
- foundations for pumps, towers, ladders, etc.,
- pipe connections.

For independent tanks type B, the extent of non-destructive testing shall be as given in a programme specially prepared for the cargo tank design.

e) The tightness of all cargo tanks is to be verified by an appropriate procedure. Provided that the effectiveness of the ship's gas detection equipment has been confirmed, it will be acceptable to utilize this equipment for the tightness test of independent tanks below deck.
f) Where findings of paragraph (a) to (e) or an examination of the voyage records raises doubts as to the structural integrity of a cargo tank, a hydraulic or hydro-pneumatic test is to be carried out. For integral tanks and for independent tanks type A and B, the test pressure is to be in accordance with IACS UR G1.10.5 or G1.10.7 as appropriate. For independent tanks type C, the test pressure is not to be less than 1.25 times the MARVS.
g) At every other special survey (i.e., 2nd, 4th, 6th, etc.), all independent cargo tanks type C are to be either:
  - Hydraulically or hydro-pneumatically tested to 1.25 times MARVS, followed by nondestructive testing in accordance with paragraph (d) or
  - Subjected to a thorough, planned non-destructive testing. This testing is to be carried out in accordance with a programme specially prepared for the tank design. If a special programme does not exist, the following applies:
    - cargo tank supports and anti-rolling/anti-pitching devices,
    - stiffening rings,
    - Y-connections between tank shell and a longitudinal bulkhead of bilobe tanks,
    - swash bulkhead boundaries,
    - dome and sump connections to the tank shell,
    - foundations for pumps, towers, ladders etc.,
    - pipe connections.

  At least 10% of the length of the welded connections in each of the above mentioned areas is to be tested. This testing is to be carried out internally and externally as applicable.

  Insulation is to be removed as necessary for the required non-destructive testing.

h) As far as practicable all hold spaces and hull insulation (if provided), secondary barriers and tank supporting structures are to be visually examined. The secondary barrier of all tanks is to be checked for their effectiveness by means of a pressure/vacuum test, a visual examination or another acceptable method.

1) For membrane and semi-membrane tanks systems, inspection and testing are to be carried out in accordance with programmes specially prepared in accordance with an approved method for the actual tank system.

2) For membrane containment systems a tightness test of the primary and secondary barrier shall be carried out in accordance with the system designers' procedures and acceptance criteria as approved by the classification society. Low differential pressure tests may be used for monitoring the cargo

containment system performance, but are not considered an acceptable test for the tightness of the secondary barrier.

3) For membrane containment systems with glued secondary barriers if the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing should be carried out.

i) The pressure/vacuum relief valves, rupture disc and other pressure relief devices for interbarrier spaces and hold spaces are to be opened, examined, tested and readjusted as necessary, depending on their design.

j) The pressure relief valves for the cargo tanks are to be opened for examination, adjusted, function tested, and sealed. If the cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are to be replaced. Where a proper record of continuous overhaul and retesting of individually identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapor relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since crediting of the previous Special Survey.

6.3.7.2 Piping Systems

a) The cargo, liquid nitrogen and process piping systems, including valves, actuators, compensators, etc. are to be opened for examination as deemed necessary. Insulation is to be removed as deemed necessary to ascertain the condition of the pipes. If the visual examination raises doubt as to the integrity of the pipelines, a pressure test at 1.25 times the MARVS for the pipeline is to be carried out. After re-assembly the complete piping systems are to be tested for leaks.
b) The pressure relief valves are to be function-tested. A random selection of valves is to be opened for examination and adjusted.

6.3.7.3. Components

Cargo pumps, compressors, process pressure vessels, liquid nitrogen tanks, heat exchangers and other components, including prime movers, used in connection with cargo handling and methane boil-off burning are to be examined as required in the Rules of each individual Society for periodical survey of machinery.

6.3.7.4 Miscellaneous

a) Systems for removal of water or cargo from interbarrier spaces and holds are to be examined and tested as deemed necessary.
b) All gas-tight bulkheads are to be inspected. The effectiveness of gas-tight shaft sealing is to be verified.
c) The following equipment is to be examined: hoses and spool pieces used for segregation of piping systems for cargo, inert gas and bilging.
d) It is to be verified that all cargo piping systems are electrically bonded to the hull.

TABLE I

TABLE OF THE MINIMUM REQUIREMENTS FOR CLOSE-UP SURVEY AT HULLSPECIAL SURVEYS OF LIQUEFIED GAS CARRIERS

Special Survey No.1 (age ≤ 5)	**Special Survey No.2 (5 < age ≤ 10)**	**Special Survey No.3 and subsequent (age > 10)**
One web frame in a representative ballast tank of the topside, hopper side anddouble hull side type (1) One transverse bulkhead in aballast tank (3)	All web frames in a ballast tank, which is to be a doublehull side tank or a topside tank. If such tanks are not fitted, another ballast tank isto be selected (1) One web frame in each remaining ballast tank (1) One transverse bulkhead ineach ballast tank (2)	All web frames in all ballasttanks (1) All transverse bulkheads in allballast tanks (2)

(1) Complete transverse web frame including adjacent structural members.
(2) Transverse bulkhead complete, including girder system and adjacent members, andadjacent longitudinal bulkhead structure.
(3) Transverse bulkhead lower part including girder system and adjacent structural members.

Note 1: Ballast tanks include topside, double hull side, double bottom, hopper side, or anycombined arrangement of the aforementioned, and peak tanks where fitted.

Note 2: For areas in tanks where coatings are found to be in GOOD condition, the extent of close-up surveys may be specially considered by the Classification Society.

Note 3: For ships having independent tanks of type C, with a midship section similar to that ofa general cargo ship, the extent of close-up surveys may be specially considered by the Classification Society.

Note 4: 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 corrosionprevention system and also in the following cases:

- in particular, in tanks having structural arrangements or details which have suffereddefects in similar tanks, or on similar ships according to available information;
- in tanks having structures approved with reduced scantlings.

TABLE II

TABLE OF MINIMUM REQUIREMENTS FOR THE THICKNESS MEASUREMENT ATHULL SPECIAL SURVEY OF LIQUEFIED GAS CARRIERS

Special Survey No.1 **age ≤ 5**	**Special Survey No.2** **5 < age ≤ 10**	**Special Survey No.3** **10 < age ≤ 15**	**Special Survey No.4 and subsequent** **age > 15**
One section of deckplating for the full beam of the ship within 0.5 L amidships in way ofa ballast tank, if any	Within the cargoarea: - each deck plate - one transverse section within 0.5 Lamidships in way ofa ballast tank, if any	Within the cargoarea: - each deck plate - two transverse sections (1) - all wind and water strakes	Within the cargoarea: - each deck plate - three transverse sections (1) - each bottom plate - duct keel platingand internals
	Selected wind andwater strakes outside the cargo area	Selected wind andwater strakes outside the cargo area	All wind and water strakes, full length
Measurements, for general assessmentand recording of corrosion pattern, ofthose structural members subject toClose-up Survey according to Table I	Measurements, for general assessmentand recording of corrosion pattern, of those structural members subject toClose-up Survey according to Table I	Measurements, for general assessmentand recording of corrosion pattern, of those structural members subject toClose-up Survey according to Table I	Measurements, for general assessmentand recording of corrosion pattern, of those structural members subject toClose-up Survey according to Table I
Suspect areas	Suspect areas	Suspect areas	Suspect areas

(1) at least one section is to include a ballast tank within 0,5L amidships, if any

Note 1: For ships having independent tanks of type C, with a midship section similar to thatof a general cargo ship, the extent of thickness measurements may be increased toinclude the tank top plating at the discretion of the Surveyor.

Note 2: For areas in spaces where coatings are found to be in GOOD condition, the extent of thickness measurements may be specially considered by the Classification Society.

Note 3: The Surveyor may extend the thickness measurements as deemed necessary.

Where substantial corrosion is found, the extent of thicknessmeasurements is to be increased to the satisfaction of the Surveyor.

TABLE III

TABLE OF THE MINIMUM REQUIREMENTS FOR CLOSE-UP SURVEY AT HULL INTERMEDIATE SURVEYS OF LIQUEFIED GAS CARRIERS	
10 < age ≤ 15	**age > 15**
Close-up survey of: - all web frames and both transverse bulkheadsin a representative ballast tank (1) and (2) - the upper part of one web frame in anotherrepresentative ballast tank - one transverse bulkhead in anotherrepresentative ballast tank (2)	Close-up survey of: -all web frames and both transverse bulkheadsin two representative ballast tanks (1) and (2)

(1) Complete transverse web frame including adjacent structural members

(2) Transverse bulkhead complete, including girder system and adjacent members, and adjacentlongitudinal bulkhead structure

Note 1: Ballast tanks include topside, double hull side, double bottom, hopper side, or anycombined arrangement of the aforementioned, and peak tanks where fitted.

Note 2: For areas in tanks where protective coating is found to be in GOOD condition, the extentof close-up survey may be specially considered by the Classification Society.

Note 3: For ships having independent tanks of type C, with a midship section similar to that of ageneral cargo ship, the extent of close-up surveys may be specially considered by the Classification Society.

Note 4: The extent of close-up surveys may be extended by the Surveyor as deemed necessary,taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:

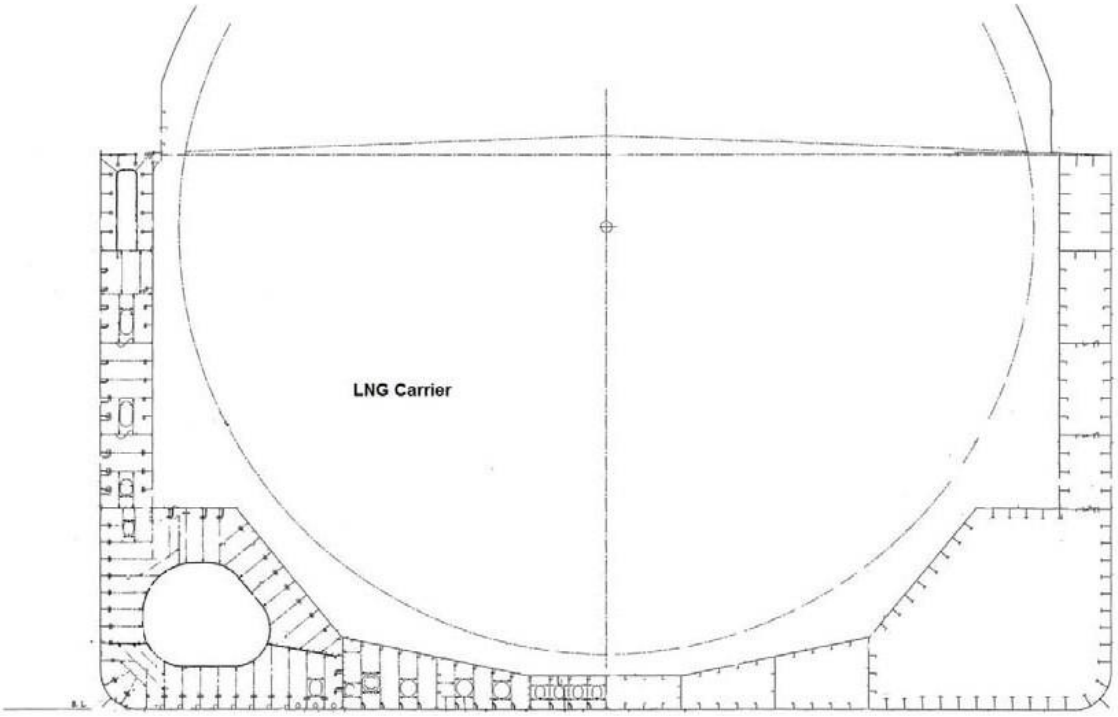
- in particular, in tanks having structural arrangements or details which have suffereddefects in similar tanks, or on similar ships according to available information;
- in tanks having structures approved with reduced scantlings.

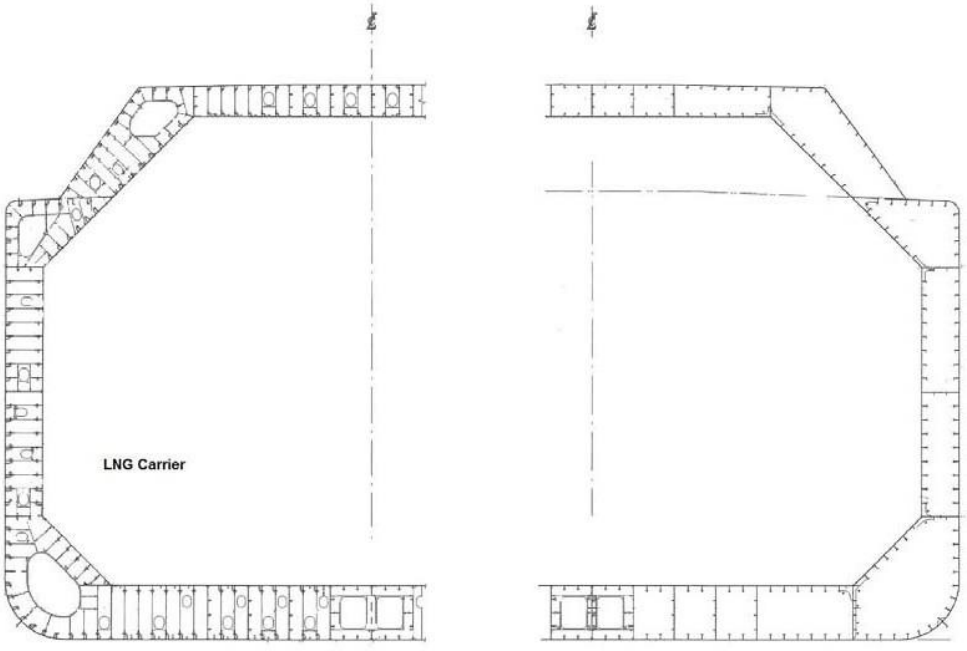
TABLE IV

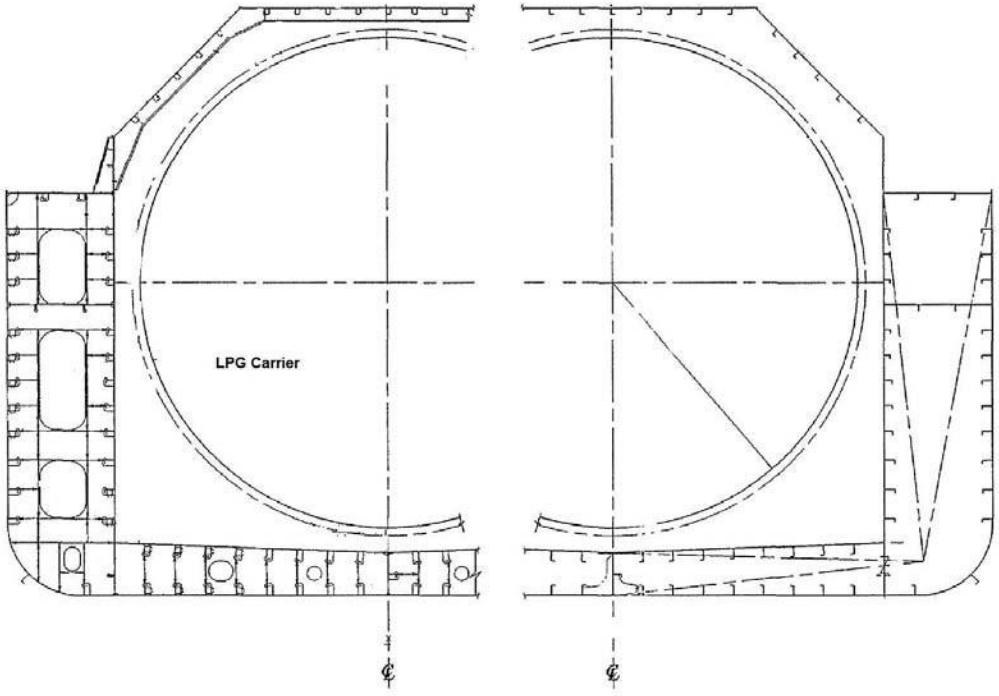
TA

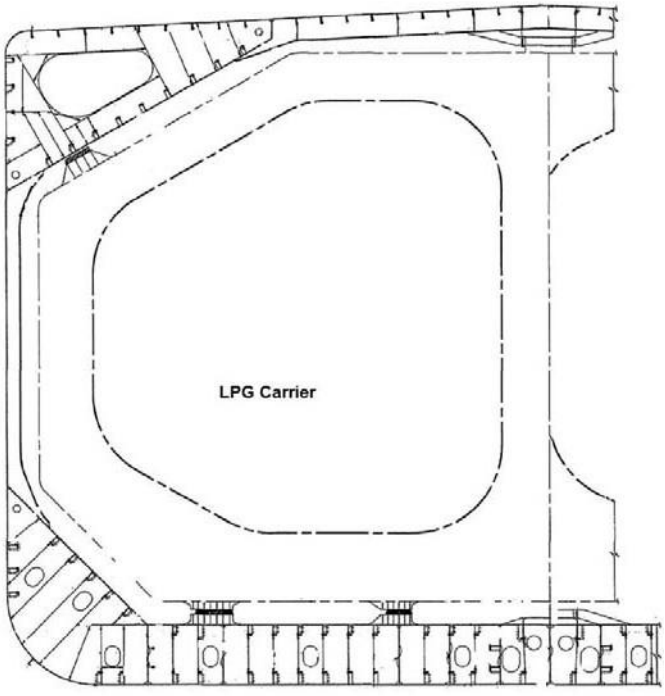
GUIDANCE FOR ADDITIONAL THICKNESS MEASUREMENTS IN WAY OFSUBSTANTIAL CORROSION		
Structural member	**Extent of Measurement**	**Pattern of Measurement**
Plating	Suspect area and adjacentplates	5 point pattern over 1 square metre
Stiffeners	Suspect area	3 measurements each in lineacross web and flange

FIGURE 1
TYPICAL MIDSHIP SECTIONS OF LIQUEFIED GAS CARRIERS






LPG Carrier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