TÜRK LOYDU

Classification and Surveys
2013

This latest edition incorporates all rule changes. The latest revisions are shown with a vertical line. The section title is framed if the section is revised completely. Changes after the publication of the rule are written in red colour.

Unless otherwise specified, these Rules apply to ships for which the date of contract for construction is on or after 1st of October 2013. New rules or amendments entering into force after the date of contract for construction are to be applied if required by those rules. See Rule Change Notices on TL website for details.

If there is a difference between the rules in English and in Turkish, the rule in English is to be considered as valid. This publication is available in print and electronic pdf version.

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Classification and Surveys

SECTION 1

GENERAL CONDITIONS

A. General

Türk Loydu (TL) is an independent, impartial, reliable, specialised, “Classification Society” which is rendering survey, audit and certification services, aiming to safeguard life, property and environment, governed by a Code of Ethics.

TL, with surveyors and technical staff carries out its work without in any way harming the intellectual property rights of shipyards, equipment suppliers, and shipowners, including patents, licences, know-how, or any other kind of knowledge whose use is legally protected at international or national level.

B. Proviso

Any confirmation or certification of compliance of technical facts or of a product with the Classification and Construction Rules published by Türk Loydu (**TL**) is due to **TL** exclusively. Mention of due observance of these regulations during production is permissible solely with the consent of **TL**.

C. Protective Rights

Application of the Rules of construction of **TL** does not infringe possible rights for protection of their products on part of the manufacturers.

D. Fees

For services rendered by **TL** fees are to be paid in accordance with the Tariffs of Fees of **TL**, even if no classification is granted. In addition to these fees, **TL** will charge for any extra expenses incurred in connection with the services rendered (e.g. travelling or other expenses and, where applicable, any value added / turnover tax).

E. Payment of Invoices

1. All fees for all services rendered by **TL** are due for payment immediately upon receipt of the invoice. On default **TL** is - without prejudice to any further claims (e.g. legal costs, overtime and other expenditure) - entitled to charge interest at a highest rate of rediscount in banking, to withhold certificates and other documents and to withdraw the classification.

2. Any rights of set-off with counter-claims in favour of the client are excluded, unless such counter-claim is undisputed or finally adjudicated upon the courts.

F. Confidentiality

TL maintains confidentiality with respect to all documents and other kinds of information received in connection with the orders entrusted to them. Documents and information shall only be provided to third parties with the prior written consent of the client, except as required by judicial order, governmental order or regulation, by subpoena or by direction of a governmental agency with subpoena power. The duty of the confidentiality shall survive the end of the contract between **TL** and the client.

Notwithstanding the general duty of confidentiality owed by **TL** to its clients in accordance with the **TL** Rules, **TL** clients hereby accept that **TL** will participate in the Early Warning System which requires each IACS Member and Associate to provide the involved Classification Societies and other relevant parties with relevant technical information on serious hull structural and engineering systems failures, as defined in the Early Warning System, but not including any drawings relating to the ship which may be the specific property of another party, to enable such useful information to be shared and utilized to facilitate the proper working of the Early Warning System. **TL** will provide its client with written details of such information upon sending the same to the involved class societies and other relevant parties.

Clients admits that **TL** has right to give access to the European Commission for the information necessary for the purposes of the assessment referred to in EC Regulation 391/2009 Article 8(1) and no contractual clauses may be invoked to restrict this access.

Free access is also to be given to auditors accompanying the surveyors of **TL** within the scope of the audits as required in pursuance of the society’s

quality system. Additionally, the client shall not oppose the access of the European Commission inspectors on board the ship to conduct inspections according to EC Regulation 391/2009 Article 8(1).

G. Liability

TL will exercise due diligence in selecting its surveyors and all other personnel whose services are employed for the purpose of performing its obligations. However if any client using the services of **TL** suffers a loss, damage or expense which is proven to have been caused by the negligent act, omission or default of TL's officers or surveyors towards the client, then the liability of TL to client shall under no circumstances exceed 2 (two) times of the fee charged for that particular service and can not exceed 40.000.-Euro.

H. Jurisdiction

The place of jurisdiction is court of İstanbul Tuzla. The place of performance is İstanbul. The governing law is Turkish law.

I. Rules

The electronic pdf version of this document found through **http:/www.turkloydu.org** is the officially binding version. Any comments can be sent by e-mail to **tl_kural@turkloydu.org.**

SECTION 2

CLASSIFICATION

A. General Principles

1. Definitions

1.1 Society denotes Türk Loydu (**TL**).

1.2 Administration means the Government of the State whose flag the ship is entitled to fly.

1.3 Rules mean requirements issued by the Society as the basis for classification.

1.4 Surveyor means personnel authorized to carry out surveys related with classification and certification.

1.5 Classification means a service verifying compliance with the rules throughout the ship's life.

1.6 Certification means a service confirming compliance with the requirements of related rules and regulations.

1.7 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 is to be declared to **TL** by the party applying for the assignment of class to a newbuilding.

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

Vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes.

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

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

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

1.8 "Date of Build" for New Construction is the year, month and date at which the new construction survey process is completed. Where there is substantial delay between completion of construction survey process and the ship commencing active service, the date of commissioning may be also specified.

In case of after modifications, "Date of Build" shall remain assigned to the ship after modifications are completed.

Where a complete replacement or addition of a major portion of the ship such as a complete forward or after section, a complete main cargo section (which may include a complete hold/ tank of a cargo ship), a complete block of deck structure of a passenger ship or a structural modification of a single hull to a double hull is involved, the following shall apply:

- "Date of Build" associated with each major portion of the ship is to be indicated where it has been agreed that the newer structure is to be on a different survey cycle;
- Survey requirements is 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 **TL**.

1.9 **"**Delivery date" is the date on which the finished vessel is handed over from the yard to the owner. Date of build and delivery date may be regarded as concurrent.

1.10 **"**Keel laying date" is the date on which the keel is laid or which are at a similar stage of construction.

Similar stage of construction is when construction identifiable with a specific ship has started and assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material (for high speed crafts three per cent), whichever is less.

Note:

For the purposes of the application of the IMO Conventions and Codes (Performance Standards, Technical Standards, Resolutions and Circulars) for Fibre-Reinforced Plastic (FRP) Craft, the term "the keels of which are laid or which are at a similar stage of construction" should be interpreted as the date that the first structural reinforcement of the complete thickness of the approved laminate schedule is laid either in or on the mould. (This provision is to be implemented from 01 January 2014)

2. Classification Process

2.1 General

The classification process consists of:

2.1.1 The development of Rules, Additional Rules, Guidelines and other documents relevant to design and construction of ships and marine vessels.

2.1.2 The review of plans and documents and surveys, checks and tests during and after construction to verify compliance with such Rules, Additional Rules, Guidelines and other documents.

2.1.3 The assignment of class when compliance with the **TL** Rules, Additional Rules, Guidelines and other documents has been verified.

2.1.4 The issuance of Class Certificate.

2.1.5 The performance of the annual, intermediate, class renewal and occasional surveys to verify that the vessel meets the conditions for maintenance of class.

2.2 Rules and regulations

2.2.1 The latest edition of Classification and Surveys rules and the construction rules of **TL** related with the ship type applicable on the date of contract between shipyard and shipowners are to be taken as a basis for the classification of new ships. Construction rules include; hull, machinery, electric, material, welding and other special rules of **TL**.

2.2.2 The rules, guidelines and other documents are, in general, developed by **TL** staff, and accepted by the related rule development committees. In rule development; international rules and regulations, theoretical researches and service experiences are utilized.

2.2.3 Respective flag state rules and regulations will not be affected by Classification and Surveys rules. Various requirements stipulated by international conventions are taken into account in **TL** Rules.

2.2.4 In statutory matters, when authorized by the flag state concerned and acting on its behalf, the Society applies the available IACS Unified Interpretations (UIs), unless the flag state provides another interpretation or decides otherwise.

2.3 Certificates and reports

2.3.1 If the applicable requirements have been met, class is to be assigned. The assignment of class is documented by the issuance of a class certificate. Class certificates are issued only for the use of **TL**, its clients and other authorized entities.

2.3.2 Certificates, reports and other document issued by **TL** are in no way intended to replace the duties and responsibilities of flag state, designers, shipbuilders, manufacturers, suppliers, owners, operators, etc.

The activities of such parties falling outside the scope of the classification, such as design, manufacturing, choice of machinery and equipment, form and performance of the ship, life-saving appliances, number and qualification of crew remain responsibility of these parties.

2.3.3 **TL** will release information from reports and certificates to the Port State to assist in rectification of deficiencies during port state controls. Such information includes condition of classification, survey due dates, and certificate expiration dates.

2.3.4 The class is to 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 five year intervals.

2.4 Responsibilities

2.4.1 Surveyor's intervention

2.4.1.1 For the purpose of verifying compliance with the rules, the client is to provide the Society's surveyors with the free access to ships and/or to their premises.

2.4.1.2 The clients are to take the necessary measures for the surveyor's inspections and testing to be carried out safely. The surveyor is to be constantly accompanied during surveys by personnel of the client.

2.4.2 Operation and maintenance of ships

2.4.2.1 The classification of a ship is based on the principle that the ship is operated in a proper manner by competent crew.

2.4.2.2 It is to be assumed that the ship is not to be loaded more than the draught of the ship corresponding to the freeboard assigned, that the ship is to be properly loaded taking into account its stability and strength and that the cargoes are to be properly stowed and secured.

2.4.2.3 Ships are to maintain at all times in proper condition complying with international safety and pollution prevention regulations;

- Load Lines Convention;
- International Convention for the Safety of Life at Sea, 1974 and its Protocol of 1978;
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto;

  International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code);
- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);

and applicable Amendments thereto, **TL** requires the applicable Convention Certificates to be issued by a flag state or by **TL**, Safety Management Certificates in accordance with the provisions of the International Safety Management Code (ISM Code) may be issued by an organisation complying with IMO Resolution A.739(18) and authorised by the flag state with which the ship is registered. Cargo Ship Radio Certificates may be issued by an organisation authorised by the flag state with which the ship is registered. In the case of dual-classed ships, Convention Certificates may be issued by the other Society with which the ship is classed provided this is recognised in a formal Dual Class Agreement with TL and provided the other Society is also authorised by the flag state. In the event of a flag state withdrawing any ship's Convention Certificate (referred to in this section) then the TL may suspend the ship's class. If a ship is removed from the flag state's Registry for the non-compliance with the Conventions or Classification Requirements referred to here in then the TL will suspend the ship's class.

In the event of ISM Code certification being withdrawn from a ship or Operator then the TL will suspend the ship's class.

2.4.2.4 Documents issued by **TL** in relation to its activities reflect the condition of the ship found at the time and within the scope of the survey. It is the interested party's responsibility to ensure proper maintenance of the ship and to inform **TL** of any events or circumstances affecting the class.

2.4.3 Port state inspections

In case of a ship's detention by port state control the operators are obliged to call in a **TL** surveyor without delay. This requirement has to be met in any case, where the deficiencies are related to statutory certificates issued by **TL** on behalf of a flag state

2.4.4 Disclosure of information

2.4.4.1 **TL** will not disclose any information received or reports made in connection with classification to any other party than those entitled or to those having been given the right to receive information by legislation, court decision or written permission from the owner.

2.4.4.2 Information recorded in **TL**'s Register of Ships which encompasses the status of classification and statutory surveys and certificates issued by **TL**, overdue conditions, class suspensions and withdrawals are to be published and/or released to

any interested party.

2.5 Appeals

The client may request in writing that a decision made by **TL** is to be taken up for reconsideration. **TL** will subsequently consider the matter and announce its decision according to its procedures.

B. Transfer of Class

1. General

1.1 Request for classification of a new ship or an existing ship is to be submitted to **TL** in writing by the client.

1.2 Class is transferred to a ship after approval of necessary plans and completion of surveys during construction or class transfer surveys in accordance with IACS PR1A.

1.3 It is to be noted that in cases of transfer of class from non IACS member class society specific requirements, different from stated in section B , are to be applied. In such cases Türk Loydu is to be contacted in order to obtain specific requirements developed for each particular case.

2. Transfer of Class to a New Ship

2.1 Scope

2.1.1 Classification covers the ship's hull, its machinery and equipment.

2.1.2 On application, certain installations may be classed separately.

2.1.3 **TL** reserve the right to extend the scope of classification to all equipment and machinery used in the operation of the ship, which by their character and/or arrangement may impair the safety of human life, of the ship and her cargo or of the environment.

2.2 Plan approval

2.2.1 Drawings and calculation required for plan approval are to be submitted to **TL**.

2.2.2 Drawings and calculations to be submitted are listed in the applicable chapter of the rules.

TL may request additional documents according to the specific nature of the ship to be classed.

2.2.3 The drawings and calculations subject to approval are to be examined by **TL** in scope of the class applied for.

2.2.4 The results of the examination are to be stated both in the drawings and in the letter of approval.

2.2.5 Modifications of the approved plans need to be reapproved.

2.2.6 Design data to be submitted with the documents are to incorporate all information necessary for the assessment of the design of the ship.

2.2.7 Submitted plans are to include the necessary information for checking the compliance with the rules.

2.3 Surveys during construction

2.3.1 When a ship is constructed under the supervision of **TL,** the Society carries out surveys, attends tests and trials stated in its rules.

TL verifies that the work is carried out in compliance with the applicable rules and standards.

2.3.2 The survey at the clients sites may consist of a combination of visual inspections, tests, measurements and review of records.

2.3.3 Welding of hull structures, machinery installations and equipment is to be carried out by approved welders, with approved welding consumables.

2.3.4 Where specified by the rules, tests are to be carried out in the presence of **TL** surveyor.

A test programme for harbour and sea trials is to be submitted to **TL** by the client.

2.3.5 Tests in addition to those stated in **TL** rules may be requested by **TL** in order to verify compliance with the rules.

2.4 Use of materials, machinery and equipment

2.4.1 Materials, machinery and equipment to be installed on new buildings are to, in general, be new.

2.4.2 All materials, machinery and equipment covered by the class and used or fitted on board ships are to be certified according to **TL** rules.

2.4.3 Second hand materials, machinery and equipment may be used on new buildings subject to the specific agreement of **TL** and the owner.

2.4.4 New installation of materials which contain asbestos is not permitted for all new and existing ships.

2.5 Defects and deficiencies

2.5.1 **TL** may reject items found as defective or need supplementary survey and tests.

2.5.2 All repairs need to be preliminary agreed with **TL**. When the defect tolerances are specified in **TL** rules or by the manufacturer, they are to be taken into consideration during repair works.

2.6 Class certificate

2.6.1 When TL satisfied that all requirements corresponding to the class in question have been met, an interim class certificate or the class certificate is to be issued. Interim class certificate is valid to a date not exceeding 5 months from transfer of class.

2.6.2 Class may be transferred with condition of class.

2.6.3 The interim certificate is to be replaced by a full term class certificate when **TL** has confirmed that applicable requirements have been met.

2.6.4 The class certificate is valid to a date not exceeding 5 years from the date of class transfer provided condition for class retention are complied with.

2.6.5 **TL** reserves the right to introduce special remarks in the class certificate stating assumptions for the transfer of the class and restrictions regarding the use of the ship.

3. Transfer of Class to an Existing Ship

3.1 General

When an Owner applies to **TL** for a ship in service for classification, she will be admitted to **TL**'s class upon verification of documentation and satisfactory surveys.

3.2 Documents

3.2.1 For a ship built in accordance with rules of an IACS member society, the following documentation is to be submitted to **TL** which is to be taken as a basis for forthcoming surveys.

3.2.1.1 Main plans

- General arrangement plan
- Capacity Plan
- Hydrostatic Curves
- Stability booklet
- Damage stability booklet, where required
- Loading manual, where required

3.2.1.2 Steel Plans

- Midship section
- Scantling Plan
- Longitudinal section and decks
- Shell expansion
- Bulkheads
- Rudder and Rudder Stock
- Hatch covers, if any.

3.2.1.3 Machinery plans

- Machinery Arrangement
- Intermediate, Thrust and Screw Shafts
- Propellers

- Main Engines, Propulsion Gears and Clutch Systems (or Manufacturer make, model and rating information)
- For Steam Turbine Vessels, Main Boilers, Superheaters and Economisers (or Manufacturer make, model and rating information) and Steam Piping
- Steering gear systems piping and arrangements and steering gear manufacturer make and model information
- Bilge piping diagram
- Ballast piping diagram
- Wiring diagram

3.2.1.4 Torsional Vibration Calculations

For vessels less than two (2) years old, torsional vibration calculations are to be submitted.

3.2.1.5 Additional requirements for vessels with ice strengthening

Plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting (or manufacturer make, model and rating information) are to be submitted.

3.2.1.6 Additional plans required for oil tankers

Pumping arrangement at the forward and after ends and drainage of cofferdams and pump rooms are to be submitted.

3.2.1.7 Additional plans required for unattended machinery space notation

The following additional plans are to be submitted:

- Instrument and Alarm List
- Fire Alarm System
- List of Automatic Safety Functions (e.g. slowdowns, shutdowns, etc.)
- Function Testing Plan

Note:

1. *Additional information may be necessary according to Flag State requirements.*

2. *Alternative technical data may be accepted by the gaining Society in lieu of specific items of the listed documentation not being available at the time of the transfer.*

3.2.2 If the documentation stated in 3.2.1 is not available, these documents are to be prepared and submitted to **TL** for approval.

3.2.3 In case of class transfer from a non-IACS Society to Türk Loydu, additional drawings and documentation are needed in addition to drawings stated in 3.2.1.

3.3 Class entry surveys

Note:

Class entry surveys may be, but are not required to be, credited as periodical surveys for maintenance of classification. Recommendations and/or conditions of class due for compliance at a specified periodical survey for maintenance of classification need not be carried out/complied with at a class entry survey unless the class entry survey is credited as the specified periodical survey for maintenance of classification or the recommendation / condition of classification is overdue.

For ships classified in the meantime by a non-IACS Classification Society, class renewal survey or intermediate survey may be required, whichever is due next.

3.3.1 Prior to transfer of class to an existing ship, that ship is to undergo the surveys based on the age and type of the ship.

The extent of these surveys is to be as follows:

3.3.1.1 Hull surveys

3.3.1.1.1 For ships of age less than 5 years, the survey is to be carried out in the scope of an annual survey.

3.3.1.1.2 For ships between 5 and 10 years, in addition, the survey is to include the inspection of representative number of ballast spaces.

3.3.1.1.3 For ships of 10 years of age and above but less than 20 years of age, in addition, the survey is to include the inspection of representative number of cargo holds and/or cargo tanks, as applicable.

3.3.1.1.4 For ships with ESP class notation and 15 years of age and above but less than 20 years of age, the survey is to be carried out in the scope of class renewal survey or of intermediate survey, whichever is due next.

3.3.1.1.5 For all ships of 20 years of age and above, the survey is to be carried out in the scope of class renewal survey.

Note:

The requirement of item 3.3.1.1.5 is also applicable to the vessels having their hull under continuous survey.

In the two latter cases, if a bottom survey in dry dock is not due at the time of class entry, consideration can be given to perform an in-water survey in lieu of bottom survey in dry dock

3.3.1.1.6 In lieu of the requirements in items 3.3.1.1.1 through 3.3.1.1.5, the following apply for site specific purpose-built Floating Production and/or Storage Vessels:

- For vessels of age less than 5 years, the survey is to have the scope of an Annual Survey;
- For vessels of age between 5 and 10 years, the survey is to include an Annual Survey and inspection of twenty percent of ballast spaces;
- For vessels of age between 10 and 20 years, the survey is to include an Annual Survey and inspection of twenty percent of ballast spaces and twenty percent of cargo spaces.
- For vessels over 20 years of age, the survey is to have the scope of a class renewal survey.

3.3.1.1.7 For site specific Floating Production and/or Storage Vessels which have been converted from other vessels, the survey is to take the form of an Annual Survey and also include inspection of twenty percent of ballast spaces and twenty percent of cargo spaces until 20 years have elapsed since conversion. After 20 years the survey is to have the scope of a class renewal survey.

3.3.1.1.8 In the context of applying items 3.3.1.1.4 and 3.3.1.1.5 above, if a dry-docking of the vessel is not due at the time of transfer, consideration can be given to carrying out an underwater examination in lieu of dry-docking.

3.3.1.1.9 In the context of applying items 3.3.1.1.1 to 3.3.1.1.8 above, as applicable,

- If the class entry survey is to be credited as a periodical survey for maintenance of class consideration may be given by the gaining society to the acceptance of thickness measurements taken by the losing society provided they were carried out within the applicable survey window of the periodical survey in question.
- If the class entry survey is not to be credited... as a periodical survey for maintenance of class, consideration may be given by the gaining society to the acceptance of thickness measurements taken by the losing society provided they were carried out within 15 months prior to completion of class entry survey when it is in the scope of a Special Survey, within 18 months prior to completion of class entry survey when it is in the scope of an Intermediate Survey.

In both cases, the thickness measurements are to be reviewed by the gaining society for compliance with the applicable survey requirements, and confirmatory gauging are to be taken to the satisfaction of the gaining society.

3.3.1.1.10 In the context of applying 3.3.1.1.3 to 3.3.1.1.8 above, as applicable, tank testing for vessels over 15 years of age is not required to be carried out as part of the class entry survey unless the class entry

survey is being credited as a periodical survey for maintenance of class.

3.3.1.1.11 In the context of applying 3.3.1.1.1 to 3.3.1.1.8 above, as applicable, compliance with IACS Unified Requirements that require compliance at the forthcoming due periodical surveys (such as S26 and S27) are not required to be carried out/completed as part of the class entry survey unless the class entry survey is credited as a periodical survey for maintenance of class.

3.3.1.2 Machinery surveys

A general examination of all essential machinery is to be held and is to include:

3.3.1.2.1 Examination under working conditions of oil fuel burning equipment of boiler, economisers and steam/steam generators. The adjustment of safety valves of this equipment is to be verified by checking the records on the vessel.

3.3.1.2.2 All pressure vessels.

3.3.1.2.3 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.

3.3.1.2.4 In all cases, navigating lights and indicators are to be examined and their working and alternative sources of power verified.

3.3.1.2.5 Bilge pumps, emergency fire pumps and remote control for oil valves, oil fuel pumps, lubricating oil pumps and forced draught fans are to be examined under working conditions.

3.3.1.2.6 Recirculating and ice clearing arrangements, if any.

3.3.1.2.7 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 Surveyors discretion if the vessel has been laid up for a long period.

3.3.1.2.8 Initial start arrangements are to be verified.

3.3.1.2.9 In the case of oil tankers, the cargo oil system and electrical installation in way of hazardous spaces are to be checked for compliance with TL Rule requirements. Where intrinsically safe equipment is installed, the surveyors are to satisfy themselves that a recognised authority has approved such equipment. The safety devices, alarms and essential instruments of the inert gas system are to be verified and the plant generally examined to ensure that it does not constitute a hazard to the vessel.

Note:

For the transfer of class or adding class at ship's delivery, items 3.3.1.2.3 and 3.3.1.2.9 may be verified by reviewing the ship's record.

3.4 Class certificate

3.4.1 When **TL** satisfied that all requirements corresponding to the class in question have been met, an interim class certificate or the class certificate is to be issued. Interim class certificate is valid to a date not exceeding five months from transfer of class.

3.4.2 Class may be transferred with condition of class.

3.4.3 The interim certificate is to be replaced by a full term class certificate when **TL** has confirmed that applicable requirements have been met.

3.4.4 The class certificate is valid to a date not exceeding 5 years from date of class transfer or, if **TL** accepts the periodical surveys credited by the previous class society, until the expiry date of the class certificate of the previous class society.

4. Register

4.1 General

4.1.1 When a vessel has been transferred class, the classification data of ship is to be included in the **TL** data file. An extract of these ship data is to be entered in the Register Book published by **TL**.

During the period of class **TL** will update these details on the basis of relevant reports submitted by the Surveyors.

4.1.2 The class transfer date is entered in the Register book. For ships built under the supervision of **TL**, the due date for the periodical surveys is to be calculated from this date. For ships built under the supervision of an other class society, the due date for the periodical surveys will depend upon the existing periodical survey schedule defined by the previous class society.

5. Transfer of Class at Vessel's Delivery

5.1 General

When an owner applies to TL to accept a vessel into class at its delivery, the vessel wil be admitted to TL's class upon verification of documentation and satisfactory surveys.

5.2 Documents

5.2.1 For a ship built in accordance with rules of an IACS member society, the documentation stated in 3.2 is to be submitted to TL as a prerequisite to obtaining a Full Term Certificate of Class.

C. Retention of Class

1. General Requirements

1.1 The hull and machinery have the same period of class. The class is to be valid on condition that the hull and the machinery are subjected to all surveys stipulated and that any repairs required are carried out to the satisfaction of **TL**.

1.2 Retention of class is conditional upon the ship is being adequately manned, and the hull, machinery and equipment is being operated such as to comply with the design and with the applicable rules.

1.3 Classed ships are to be subjected to surveys for the retention of class. These surveys include annual survey, intermediate survey and class renewal survey.

These surveys are to be carried out at the intervals laid down in the following. In addition to the above periodical surveys, ships are to be subjected to occasional surveys, where required.

1.4 The surveys are to be performed according to the relevant requirements in order to verify that the hull, machinery and equipment comply with the applicable rules and will remain in satisfactory condition.

1.5 If the hull and/or machinery are not subjected to the prescribed surveys on their due dates, the class will be suspended.

If special shipboard equipment classed is not subjected to the prescribed surveys on their due dates, the class of the special equipment only will be suspended.

1.6 **TL** Head Office or one of the Society's representations are to be immediately informed about any average or deficiencies and damages to hull and machinery or other equipment classed, where these may be of relevance to the vessel's class. A survey will have to be arranged for a date no later than that of vessel's arrival at the next port.

If the survey reveals that vessel's class has been affected, it will be maintained only on condition that the repairs or modifications demanded by **TL** will be carried out within the period specified by the Surveyor.

2. Definitions

2.1 Anniversary date

Anniversary date means the day of the month of each year in the period of class which corresponds to the expiry date of the period of class.

2.2 Ballast tank

A ballast tank is a tank which is used primarily for sea water ballast.

For single skin or double skin bulk carriers, a ballast tank is a tank which is used solely for sea water ballast, or, where applicable, a space which is used for both cargo and sea water ballast is to be treated as a ballast tank when substantial corrosion has been found in that space.

For oil tanker and chemical tankers, a ballast tank is a tank which is used solely for the carriage of sea water ballast.

2.3 Cargo area

The cargo area is that part of the ship which contains cargo tanks, slop tanks, cargo pump-rooms including pump-rooms, cofferdams, ballast tanks or void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above mentioned spaces.

2.4 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.

2.5 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 or hard scale at 10% or more, of areas under consideration.

2.6 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 recommendations.

2.7 Critical areas

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

2.8 Exceptional circumstances

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

2.9 Overall survey

An overall survey is a survey intended to report on the overall condition of the hull structure and determine the extent of additional close-up surveys.

2.10 Overdue surveys

Each periodical survey is assigned a limit date specified by the relevant requirements of the rules by which it is to be completed.

A survey becomes overdue when it has not been completed by its limit date.

2.11 Period of class

Period of class means the period starting either from the date of the initial classification or from the credited date of the last class renewal survey, and expiring at the limit date assigned for the next class renewal survey.

2.12 Recommendations

Any defect and/or deficiency affecting the class and to be dealt with within a specific period of time is indicated as a recommendation. A recommendation is pending until it is cleared. Where it is not cleared by its limit date, the recommendation is overdue.

2.13 Representative tanks or spaces

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

2.14 Substantial corrosion

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

2.15 Suspect areas

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

2.16 Time window

Time window means the fixed period during which annual and intermediate surveys are to be carried out.

2.17 Transverse section

A transverse section includes all longitudinal members contributing to longitudinal strength, such as plating, longitudinals and girders, longitudinal bulkheads. For transversely framed ships, a transverse section includes adjacent frames and their end connections in way of transverse sections.

2.18 Confined Space

Confined space means a space that has any of the following characteristics:

- Limited openings for entry and exit
- Unfavourable natural ventilation
- Not designed for continuous worker occupancy

It may include, but is not limited to: boilers, pressure vessels, cargo spaces (cargo holds, or cargo tanks), cargo space stairways, ballast tanks, double bottoms, double hull spaces, fuel oil tanks, lube oil tanks, sewage-tanks, pump-rooms, compressor rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, engine crankcases, excavations and pits.

For confined space safe entry requirements, IACS PR37 is to be applied.

2.19. Double Class Vessel

Double class vessel is a vessel which is classed by TL and another Society and where each work as if it is the only Society classing the vessel, and does all surveys in accordance with its own requirements and schedule.

Requirements pertaining to adding, maintaining or withdrawing of a double class are to be in accordance with the IACS PR 1B and PR 1 Annex.

2.20 Dual Class Vessel

Dual class vessel is a vessel which is classed by TL and another Society between which there is a written agreement regarding sharing of work.

Requirements pertaining to adding, maintaining or withdrawing of a dual class are to be in accordance with the IACS PR 1B and PR 1 Annex.

3. Survey Procedure

3.1 General

3.1.1 The objective of a survey is to be to ascertain that the ship are in compliance with the rules and suitable for continued safe operation.

3.1.2 A survey may consist of an overall examination of the ship, checking selected items, attending required tests and trials.

3.1.3 When a survey results in the identification of significant corrosion, structural defects or damages which, in the opinion of the surveyor, affect the ship's class, remedial measures are to be taken before the ship continues in service.

3.1.4 **TL**, may extend the scope of survey stated in Section 3, whenever and so far as considered necessary, or modify them for the special ship types or systems.

3.1.5 The extent of any survey also depends on the condition of the ship. If the surveyor has any doubt as to the condition of the ship, or be advised of any deficiency or damage which may affect class, then further examination and testing may be conducted.

3.2 Postponement of survey and extension of certificate

3.2.1 **TL** reserves the right to extent the class certificate by postponing the survey, taking into account particular circumstances.

3.2.2 When a survey becomes overdue during a voyage or not in a port in which the ship is to be surveyed, the following procedure is to be applied.

3.2.2.1 In the case of annual and intermediate surveys, no postponement is granted. Such surveys are to be performed within their prescribed time window.

3.2.2.2 In the case of a class renewal survey, TL may grant an extension of class to allow for completion of the class renewal survey, provided that there is documented agreement to such an extension prior to the expiry date of the class certificate and provided that positive arrangements have been made for attendance of the Surveyor at the first port of call, and provided that the Society is satisfied that there is technical justification for such an extension. Such an extension is to be granted only until arrival at the first port of call which the ship can be surveyed after the expiry date of the class certificate.

No certificate shall be extended for a period longer than three months, and a ship to which an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without having a new certificate. Validity of class certificates are laid down in 4.3.2.2.

However, if owing to “exceptional circumstances” the class renewal survey cannot be completed at the first port of call, 3.2.3 may be followed, but the total period of extension shall in no case be longer than three months after the original due date of the class renewal survey.

3.2.3 Under “exceptional circumstances” as defined in 2.8, TL may grant an extension not exceeding three (3) months to allow for completion of the Class Renewal Survey provided that the vessel is attended and the attending Surveyor(s) so recommend(s) after the following has been carried out:

- Annual survey;
- Re-examination of Conditions of Class;
- Progression of the Class Renewal Survey as far as practicable;
- In the case where dry docking is due prior to the end of the class extension, an underwater examination is to be carried out by an approved diving company. An underwater examination by an approved company may be dispensed with in the case of extension of dry-docking survey not exceeding 36 months interval provided the ship is without outstanding Condition of Class regarding underwater parts.

3.3 Preparations for surveys

3.3.1 Before Türk Loydu starts work, the Client shall inform Türk Loydu about relevant safety issues and take all necessary safety-related measures to ensure a safe work environment for the persons carrying out the work for Türk Loydu and shall comply with all legal and other safety regulations.

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

3.3.3 In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces are to be cleaned. Spaces are to be sufficiently clean and free from water, scale, dirt, oil residues, etc. and sufficient illumination is to be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration and condition of coating.

3.3.4 Where soft coating have been applied, safe access is to be provided 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 can not be provided, the soft coating is to be removed.

3.3.5 A communication system is to be arranged between the survey party in the cargo hold, tank or other space being examined and the responsible officer on the deck or navigation bridge.

3.3.6 Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles are to be made available during the survey.

3.3.7 Adequate protective clothing is to be made available and used during the survey.

3.3.8 Surveys of tanks or applicable holds by means of boats or rafts may only be undertaken with the agreement of the surveyor, provided the expected rise of water within the tank does not exceed 0.25 m.

3.3.9 When rafts or boats are used for close-up surveys, the following conditions are to be observed:

3.3.9.1 Only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, are to be used.

3.3.9.2 The boat or raft is to be tethered to the access ladder and additional person is to be stationed down the access ladder with a clear view of the boat or raft.

3.3.9.3 Appropriate life-jackets are to be available for all participants.

3.3.9.4 The surface of the water in the tank or hold is to be calm (the expected rise of water within the tank or hold is not to exceed 0.25 m.) and the water level either stationary or falling.

3.3.9.5 The tank, hold or other space must contain clean ballast water only. Even a thin layer of oil on the water is not acceptable.

3.3.9.6 At no time is the water level to be allowed to be within 1 m. of the deepest under deck web face so that the survey team is not isolated from a direct escape route to the tank hatch.

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

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

- When the coating of the under deck structure is in good condition and there is no evidence of wastage, or

- If a permanent means of access is provided in each bay to allow safe entry and exit. This means :

  - Access direct from the deck via a vertical ladder and a small platform fitted approximately 2 m below the deck in each bay, or

  - Access to deck from a longitudinal permanent platform having ladders to deck in each end of the tank. The platform is, for the full length of the tank, to be arranged in level with, or above, the maximum water level needed for rafting of under deck structure.

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

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

3.3.10.1 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.

3.3.10.2 Cement or other protective material is to be removed when there is any doubt as to the condition of the plating underneath.

3.3.10.3 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. If doubts arise, the surveyor may require more extensive removal of the solid ballast.

3.3.10.4 In refrigerated cargo spaces the condition of the coating behind the insulation is to be examined at representative locations. The examination may be limited to verification that the protective coating remains effective and that there are no visible structural defects. Where poor coating condition is found, the examination is to be extended as deemed necessary by the Surveyor. The condition of the coating is to be reported. If indents, scratches, etc., are detected during surveys of shell plating from the outside, insulations in way are to be removed as required by the Surveyor, for further examination of the plating and adjacent frames.

3.4 Access to structures

3.4.1 For overall survey, means are to be provided to enable the surveyor to examine the hull structure in a safe way.

3.4.2 For close-up survey, one or more of the following means of access is to be provided:

- Permanent staging and passages through structures,
- Temporary staging and passages through structures,
- Lifts and movable platforms,
- Boats or rafts,
- Other equivalent means.

3.5 Damage and repairs

3.5.1 Any damage or excessive wastage beyond allowable limits to side shell frames, their end attachments and/or adjacent shell plating, the bottom structure and bottom plating, the watertight or oiltight bulkheads and the hatch covers or hatch coamings that affect a vessel's class, is to be permanently repaired immediately after the survey.

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

Damages or excessive wastage at the areas noted above and not immediately affecting the vessel's structural or watertight/weathertight integrity may be temporarily repaired for a period to be defined.

3.5.2 In exceptional cases, following inspection of hull and machinery, performance of the repairs required for maintenance of the original class may be dispensed with, if owners agree to the class and/or the range of service being restricted, or possibly a higher freeboard being assigned.

3.5.3 Where parts are damaged or worn to such an extent that they no longer comply with the requirements of **TL**, they are to be repaired or replaced.

3.5.4 Maintenance work, repairs and conversions of ships and special equipment classed have to be carried out under the supervision of **TL** to ensure maintenance or reassignment of class.

3.5.5 The areas affected by the repair and conversion are to be treated in the same way as newbuildings, irrespective of whether the hull, the machinery including the electrical installation, the inert gas system, automated systems or other equipment classed are concerned.

3.5.6 If following major conversions a new character of class and/or new notations are assigned so that new certificates have to be issued, commencement of a new period of class may be agreed upon.

4. Class Certificate

4.1 Issue of class certificate

4.1.1 For all classed ship, a class certificate, bearing the class notation and an expiry date, is to be issued.

This certificate is also provided with annexes giving information necessary for the management of the certificate and for performing the class surveys.

4.1.2 The class certificate and its annexes are to be made available to **TL** surveyors upon request.

4.2 Validity of class certificate

4.2.1 During the class period, a class certificate is valid when it is not expired.

The class is maintained during a certain period or at a given date, when during the said period or at such date the condition for suspension or withdrawal of class are not met.

4.2.2 At the request of the owner, a statement confirming the maintenance of class may be issued by **TL** based on the information in its records.

4.3 Endorsement and renewal of the class certificate

4.3.1 Endorsement of the class certificate

4.3.1.1 The class certificate is to be endorsed with the relevant entries in the appropriate annexes upon satisfactory completion of annual, intermediate and class renewal surveys.

4.3.1.2 Each endorsement consists of sections for the description of:

- The surveys held,
- The imposed, deleted and postponed recommendations,
- The unchanged existing recommendation.

4.3.2 Renewal of the class certificate

4.3.2.1 A new class certificate will replace the existing class certificate when class renewal survey has been satisfactory completed and **TL** is satisfied that the requirements for retention of class have been met.

4.3.2.2 The new class certificate is to be valid to a date not exceeding 5 years from:

- The expiry date of the existing certificate when the class renewal survey has been completed within 3 months before the expiry date of the existing class certificate, or
- The expiry date of the existing certificate when the class renewal survey has been completed after the expiry date of the existing class certificate, or
- The completion date of the class renewal survey when the class renewal survey has been completed more than three months before the expiry date of the existing certificate, or
- The completion date of the class renewal survey when the class renewal survey has been commenced more than 15 months before the expiry date of the existing certificate.

4.3.2.3 In cases where postponement of a class renewal survey has been granted, the new class certificate is to be valid to a date nor exceeding 5 years from the expiry date of the existing certificate before the postponement was granted.

4.3.2.4 In cases where the class renewal surveys carried out concurrently with a conversion, the validity of the new certificate is to be 5 years from the date of completion of the conversion, if so decided by **TL**.

5. Suspension, Reinstatement and Withdrawal of Class

5.1 General

5.1.1 Class may be withdrawn at any time if **TL** finds it justified.

5.1.2 TL may suspend or withdraw a ship's class where the condition for retention of class has been violated.

5.1.3 The decision to suspend or withdraw a ship's class is made by **TL**. However, in cases of automatic suspension, no individual evaluation is made.

5.1.4 Suspension or withdrawal of class may take effect immediately or after a specified period of time.

5.1.5 If the violation only affects requirements related to additional class notations, the suspension or withdrawal may be limited to these class notations only.

5.1.6 When the class is suspended or withdrawn, **TL** will notify the client and flag state in writing, make an entry to this effect in its register and make the information publicly available.

5.1.7 In the case of class suspension, a time limit will be given for when the class will be withdrawn.

5.2 Suspension of class

5.2.1 The class may either be suspended automatically or following the decision of **TL**. In both cases, the ship is to be considered as not retaining its class beginning from the date of suspension until the date when class is reinstated.

5.2.2 The class will automatically be suspended in the event that the Renewal Survey has not been completed and no postponement has been granted or is not under attendance for completion prior to resuming trading, by the due date when the 5-year Class Certificate expires.

5.2.3 If the annual survey has not been completed within three (3) months of the due date of the annual survey or intermediate survey has not been completed within three (3) months of the due date of the third annual survey in each periodic survey cycle or if continuous survey item(s) due or overdue at time of annual survey are not surveyed or postponed by agreement or if recommendations are not dealt with, or postponed by agreement, by the due date; the class is automatically suspended with immediate effect, unless the ship is under attendance for completion of the relevant survey.

5.2.4 **TL** may decide to suspend a ship's class if the ship is deemed to be unable to continue safe operation.

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

- Exams the ship's records,
- Carries out the due and/or overdue surveys and examination of Recommendations / Conditions of Class at the first port of call when there is an unforeseen inability of the TL to attend the vessel in the present port, and
- Has satisfied itself that the vessel is in condition to sail for one trip to a discharge port and subsequent ballast voyage to a repair facility if necessary. (Where there is unforeseen inability of the TL to attend the vessel in the present port, the master is to confirm that his ship is in condition to sail to the nearest port of call.)

5.2.6 If any outstanding debt owed to **TL** is not paid within a notified date, **TL** may suspend the ship's class with immediate effect.

In addition to the conditions laid down in 5.2.1 to 5.2.3, a ship's class may be suspended with immediate effect in cases where:

- Repair of deficiencies has not been carried out or otherwise dealt with in an appropriate manner, or
- Repair of deficiencies has not been surveyed and accepted by the surveyor,

5.3 Reinstatement following class suspension

5.3.1 If the overdue surveys and recommendations leading to class suspension as given in items 5.2.2, 5.2.3, 5.2.4 and 5.2.5 are carried out within the specified time, the class is to be reinstated provided the following is met:

- The results of the survey are such that all observed deficiencies are satisfactory rectified. TL may, after consideration, accept that minor deficiencies are pending to be carried out;
- No overdue periodical surveys or overdue recommendations at that time.

5.3.2 **TL** reserves the right to reject an application for reinstatement of class.

5.3.3 When the class is reinstated, **TL** will confirm this in writing to the client and to the flag state.

5.3.4 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 is no other reason for suspension.

5.4 Withdrawal of class

5.4.1 The class is to be withdrawn at the clients request.

5.4.2 When class of a vessel has been suspended or a period of six (6) months due to overdue surveys and/or recommendations / conditions of class, the class is to be withdrawn. A longer suspension period may be granted when the vessel is not trading as in cases of layup, awaiting disposition in case of a casualty or attendance for reinstatement.

5.4.3 When a ship 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.

5.4.4 If any outstanding debt owed to **TL** is not paid within a notified date, **TL** may withdraw the ship's class with one month's written notice.

5.4.5 Where a ship has been detained following a Flag State or Port State Control inspection on one or more occasions with serious deficiencies found, or been subject to a non-programmed survey with serious deficiencies found, the class will be liable to be suspended or withdrawn, at the discretion of TL Technical Committee. In these cases, a period of notice, but not exceeding 3 months, may be given to owner prior to any suspension or withdrawal of class.

5.4.6 **TL,** also**,** will withdraw the class, when the ship is reported as a constructive total lost, when the ship is lost and when the ship is reported scrapped.

5.4.7 When the withdrawal of class of a ship comes into effect, **TL** will forward the client and the flag state written notice, delete the ship from its register and make the information publicly available.

5.5 Re-assignment of class following class withdrawal

5.5.1 If the circumstances leading to withdrawal of class no longer exist, a ship may be re-assigned class upon written request. The extent of survey is to be decided by **TL.**

5.5.2 **TL** reserves the right to reject an application for re-assignment of class.

5.5.3 A new class certificate is to be issued when the survey has been satisfactory completed and **TL** is satisfied that the requirements for retention of class have been met.

5.5.4 When the ship is re-assigned class, **TL** will confirm this in writing to the client and to the flag state and make the information publicly available.

5.6 Suspension and reinstatement of class of dual classed vessels

5.6.1 When a vessel is dual classed and in the event that Türk Loydu takes action to suspend the class of the vessel for technical reasons, Türk Loydu will advise the other Society of the reasons for such action and the full circumstances within five (5) working days.

5.6.2 Türk Loydu will, upon receipt of this advice, also suspend the class of the vessel, unless it can otherwise document that such suspension is incorrect.

5.6.3 When Türk Loydu decides to reinstate class, it is to inform the other Society.

6. Change of Ownership

In the case of change of ownership, the ship retains its current class provided that **TL** is informed of the change in advance to carry out any survey deemed appropriate and the new owner signs the request involving acceptance of **TL**'s general condition and rules.

7. Lay-up and Re-commissioning

7.1 General

A ship put out of commission may be subjected to specific requirements for maintenance of class provided that the owner notifies **TL** of the situation.

If the owner does not notify **TL** 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 performed by their limit dates.

7.2 Lay-up maintenance program

7.2.1 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 performed as long as the ship remains laid-up. The other periodical surveys which become overdue during lay-up period may be postponed until the re-commissioning of the ship.

7.2.2 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 recommissioned, subject to the satisfactory completion of the annual lay-up condition survey as described in 7.2.1.

7.3 Periodical surveys

The periodical surveys performed during the lay-up period may be credited, either fully or in part, at the discretion of **TL**, having particular regard to their extent and dates. These surveys are to 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.

7.4 Re-commissioning

7.4.1 When a ship is re-commissioned, the owner is to notify **TL** and make provisions for the ship to be submitted to the following surveys.

7.4.1.1 An occasional survey prior to re-commissioning, the scope of which depends on the duration of the lay-up period.

7.4.1.2 All periodical surveys which have been postponed in accordance with 7.2.1, taking into account the provision of 7.3.

7.4.2 Where the previous period of class expired before the re-commissioning and was extended as stated in 7.2.2, 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 the15 months preceding the re-commissioning may be credited. A new period of class is assigned from the completion of this class renewal survey.

7.5 Vessels laid-up in accordance with item 7.1 prior to surveys becoming overdue, need not be suspended when surveys addressed in item 5.2 become overdue. However, vessels which are laid-up after being suspended as a result of surveys going overdue, remain suspended until the overdue surveys are completed.

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

7.7 When a vessel is intended for a single voyage from laid-up position to repair yard with any periodical survey overdue, the vessel's class suspension may be held in abeyance and consideration may be given to allow the vessel to proceed on a single direct ballast voyage from the site of lay up to the repair yard, upon agreement with the Flag State, provided the **TL** finds the vessel in satisfactory condition after surveys, the extent of which are to be based on surveys overdue and duration of lay-up. A short term Class Certificate with conditions for the intended voyage may be issued. This is not applicable to vessels whose class was already suspended prior to being laid-up.

D. Classification Notations

1. General

1.1 Classification notations are assigned in order to determine applicable rule requirements for assignment and retention of class. Within the scope of classification, the characteristics of hull, machinery and equipment are reflected in the classification notations.

1.2 Classification notations cover mandatory and optional class notations.

2. Mandatory Class Notations

2.1 General

All ships classed by **TL** are to be given a class notation consisting of a construction symbol, character of class, service area restriction notation (if any), ship type notation, survey scheme notation and damage stability notation.

2.2 Construction symbols

The construction symbols are to be given as follows:

2.2.1 The construction symbol **+** is to be given to ships constructed under the supervision of **TL** and with certification of materials, machinery and equipment required to be certified according to **TL** rules.

2.2.2 The construction symbol **(+)** is to be given to ships constructed under the supervision of **TL** and without certification of materials, machinery and equipment required to be certified according to **TL** rules.

2.2.3 The construction symbol **[+]** is to be given to ships constructed under the supervision of and in accordance with the rules of another recognized classification society and later assigned class with **TL**. For such ships the class notations which **TL** considers to have the equivalent intent is to be assigned.

2.2.4 The ships which have been constructed under no classification will have non of the notations mentioned above.

2.3 Character of class

2.3.1 Hull

2.3.1.1 The character of class **1A5** is to be given to ships with its hull found to be in compliance with the requirements of **TL** construction rules or other rules considered to be equivalent. The figure 5 indicates the duration of the class period in years.

2.3.1.2 The character of class **1A3, 1A2, 1A1** is to be given to ships with its hull does not comply or no longer fully complies with the requirements of **TL** construction rules, however, the class may be maintained for a shorter period, with shorter survey intervals.

The figures 3,2,1 indicate the duration of the period of class, in years.

2.3.2 Machinery

2.3.2.1 The character of class **M** is to be given to ships with its machinery including electrical installationsfound to be in compliance with the requirements of **TL** construction rules or other rules considered to be equivalent.

2.3.2.2 The character of class **T-M** is to be given to Non-self-propelled vessels and floating units with its machinery including electrical installations found to be in compliance with the requirements of **TL** construction rules or other rules considered to be equivalent.

2.3.2.3 The character of class **[M]** or **[T-M]** is to be given to ships and floating units with its machinery including electrical installations does not fully comply with the requirements of **TL** construction rules, but functional safety and seaworthiness are ensured for the envisaged service.

2.4 Service area notations

2.4.1 Seagoing ships

The following service area notations are to be given to ships complying with the construction rule requirements for a restricted range of service only:

2.4.1.1 Restricted International Service - Y

This range of service is limited, in general, to trade along the coast, provided that the distance to the nearest port of refuge and the offshore distance do not exceed 200 nautical miles, as well as to trade in the North Sea and within enclosed seas, such as the Mediterranean, the Black Sea and waters with similar seaway conditions.

2.4.1.2 Coastal Service - K50/K20

This range of service is limited, in general, to trade along the coasts, provided that the distance to the nearest port of refuge and the offshore distance do not exceed 50/20 nautical miles, respectively, as well as to trade within enclosed seas, such as the Baltic Sea, Marmara Sea and gulfs with similar seaway conditions.

2.4.1.3 Coastal Service – K6

This range of service is limited for passenger vessels to trade along the coasts, provided that the distance to the nearest port of refuge and the offshore distance do not exceed 6 nautical miles. This area of service is restricted to trade in shoals, bays, haffs and firths or similar waters, where heavy seas do not occur.

2.4.1.4 Harbour Service - L1/L2

Additional class notation for ship operates within the domestic waters.

L1 This range of service is limited to trade in harbours which their boundaries fixed by flag state, provided that to stay in the range of L2.

L2 This range of service is limited to trade in harbours not exceeding 10 nautical miles from safe anchorage and not exceeding 100 nautical miles from the port of departure.

2.4.2 Inland vessels

2.4.2.1 Inland Waterway Service - I

This notation applies to inland vessels, i.e. vessels intended for navigation in inland waters only.

Inland waters shall comprise:

- All of Europe's inland waterways,
- All of Europe's maritime waterways up to the boundaries of the sea, while considering the freeboard specified in each case,
- Other waters showing comparable conditions.

Observance of the boundaries generally fixed by official regulations is a prerequisite for validity of the class. For inland vessels which proceed beyond the sea boundary within closely confined limits and which are consequently employed in areas exposed to seaway hazards, the range of service of the class may be extended subject to the conditions stated in the Construction Rules.

For ships trading in defined river systems or waters only, deviations from the rule requirements for the equipment may be either admitted by the authorities or required by them. In such cases, the range of service symbol will be supplemented by indication of the respective area or river system, e.g. **KEBAN** or **DANUBE**.

2.5 Ship types

Ships of a special type, design or construction, or designed to carry defined cargoes, are to be given relevant descriptive notation affixed to their characters of classification, as shown in the following examples.

2.5.1 Passenger ship

A passenger ship is a ship which carries more than 12 passengers and ships complying with the Construction Rules for the carriage and/or accommodation of passengers and with the applicable requirements of the Chapters II-1 and II-2 of the SOLAS Convention Exemptions from these requirements may be granted only within the framework of options given therein and are subject of approval by the competent flag state.

2.5.2 Ro-Ro passenger ship

Ships complying with the construction and safety rules for carriage of passengers and specially equipped to carry wheeled vehicles or trains are to be given **RO-RO PASSENGER SHIP** notation.

2.5.3 Passenger ship-class A/B/C/D, Ro-Ro passenger ship-class A/B/C/D

For passenger ships intended to operate within domestic waters and complying with the requirements of EU Directive 2009/45/EC dated 06.05.2009 are to be given **RO-RO PASSENGER SHIP or PASSENGER SHIP, CLASS A/B/C/D.**

2.5.4 (….) Passenger Vessel

Ships constructed of non-steel materials according to the current rules related with accommodation and carriage of more than 12 passengers safely are to be given **(….) PASSENGER VESSEL.** Ships engaged in national trade subject to the corresponding national regulations.

2.5.5 Cargo ships

2.5.5.1 General cargo ship

Ships constructed for the carriage of general dry cargo which are not carried in containers, are to be given **GENERAL CARGO SHIP** notation.

2.5.5.2 Container ship

Ships intended exclusively for the carriage of containers and equipped with appropriate facilities are to be given **CONTAINER SHIP** notation.

2.5.5.3 Ships equipped for carriage of containers

Ships carrying containers occasionally or as part cargo only and equipped with the appropriate facilities are to be given **EQUIPPED FOR CARRIAGE OF CONTAINERS** notation.

2.5.5.4 Hatchcoverless container ship

Hatchcoverless container ships equipped with the appropriate facilities are to be given **OPEN TOP** notation.

2.5.5.5 Equipped for carriage of cars

Ships provided with special equipment for carriage of (non-loaded) motor vehicles are to be **given EQUIPPED FOR CARRIAGE OF CARS** notation.

2.5.5.6 Ro-Ro cargo ship

Ships designed for the transportation of motor vehicles (without passengers) and strengthened and equipped in accordance with relevant **TL** rules are to be given **RO-RO SHIP**notation.

2.5.5.7 Multi-purpose dry cargo ship

Ships constructed for the carriage of general cargo and bulk cargo is to be given **MULTI-PURPOSE DRY CARGO SHIP** notation.

2.5.5.8 Livestock carrier

Ships constructed and equipped for the carriage of livestock are to be given **LIVESTOCK CARRIER** notation.

2.5.5.9 Bulk carrier

2.5.5.9.1 Ships complying with **TL** rules, Chapter 1 - Hull, Section 27 and are intended primarily to carry dry cargo in bulk, are to be given **BULK CARRIER** notation.

2.5.5.9.2 For bulk carriers contracted for construction on or after July 1st 2003, having a length of 150 m. or above, the following notations may be assigned, depending on the loading conditions, filling ratios of cargo holds, etc.:

For bulk carriers designed to carry dry bulk cargoes of cargo density less than 1.0 t/m^3 are to be given **BC-C** notation.

For bulk carries designed to carry dry bulk cargoes of cargo density of 1,0 t/m^3 and above with all cargo holds loaded in addition to BC-C conditions are to be given **BC-B** notation.

For bulk carries designed to carry dry bulk cargoes of cargo density of 1,0 t/m^3 and above with specified holds empty at maximum draught in addition to BC-B conditions are to be given **BC-A** notation.

2.5.5.9.3 Depending on the limitations to be taken into account during operation as a consequence of the design loading conditions, the following additional mandatory notations may be applied:

- For bulk carrier notations BC-A, BC-B and BC-C not designed for loading and unloading in multiple ports are to be given **{no MP}** notation.

- For bulk carrier notations BC-A and BC-B

designed for a maximum cargo density 3,0 t/m^3 is to be given **{MAXIMUM CARGO DENSITY x.y t/m^3}** notation.

- For bulk carrier notation BC-A is to be given **{HOLDS a,b,…. MAY BE EMPTY}** notation.

- For bulk carrier notations BC-A or BC-B are always completed by the additional service feature **GRAB [X]**. For these ships the requirements for the Grab [X] notation are to be complied with for an unlade grab weight X equal to or greater than 20 tons. For all other ships the notation **GRAB [X]** is voluntary.

2.5.5.10 Ore carrier

Ships designed for carriage of bulk cargo and ore cargo respectively and strengthened in accordance with **TL** rules are to be given **ORE CARRIER** notation.

2.5.5.11 Cement carrier

Ships designed for the carriage of cement and equipped with corresponding cargo loading and unloading equipment are to be given **CEMENT CARRIER** notation.

2.5.5.12 Tankers, general

Ships constructed for carriage of liquid cargo and complying with the relevant **TL** rules may have one of the following notations:

2.5.5.12.1 Oil tanker

Ships intended for transport of oil in bulk are to be given **OIL TANKER** notation.

2.5.5.12.2 Product Tanker

Ships intended for transport of all type of oil product in bulk except crude oil are to be given **PRODUCT TANKER** notation.

2.5.5.12.3 Chemical Tanker

Ships intended for transport of all types of liquid chemicals in bulk are to be given **CHEMICAL TANKER TYPE 1/2/3** notations.

2.5.5.12.4 Liquefied Gas Tanker

Ships intended for transport of liquefied gas in bulk are to be given **LIQUEFIED GAS TANKER TYPE 1G/2G/2PG/3G** notation.

2.5.5.13 Tankers, for special cargoes

Tankers for special cargoes and complying with the relevant rules are to be given, e.g., one of the following notations:

ASPHALT TANKER
SPECIAL TANKER
EDIBLE OIL TANKER
WINE TANKER
WATER TANKER
FRUIT JUICE TANKER

2.5.5.14 Combination carriers

Ships intended to alternatively carry dry cargo or liquids in bulk and complying with the relevant rules are to be given, e.g., one of the following notations:

BULK CARRIER / PRODUCT TANKER
BULK CARRIER / OIL TANKER
ORE CARRIER / PRODUCT TANKER
ORE CARRIER / OIL TANKER

2.5.5.15 Fishing vessels

Ships complying with **TL** rules Chapter 14 - Fishing Vessels, are to be given **FISHING VESSEL** notation.

2.5.5.16 Floating dock

Floating docks complying with **TL** rules, Chapter 1 - Hull, Section 35 and are intended to operate in harbours or sheltered waters, are to be given **FLOATING DOCK** notation**.**

2.5.3 Special-purpose vessels

Ships or floating units specially designed, constructed and equipped for their intended purpose are to be given, e.g., one of the following notation:

BARGE
HOPPER BARGE
HOPPER DREDGER
PUSHER/BARGE
PUSHER
FLOATING CRANE
PONTOON CRANE
HYDROFOIL
ICE-BREAKER
PILOT BOAT
PONTOON
RESCUE VESSEL
RESEARCH VESSEL
SPECIAL PURPOSE SHIP
DREDGER
SUCTION DREDGER
BUCKET DREDGER
CUTTER SUCTION DREDGER
BACKHOE DIPPER DREDGER
TUG
ESCORT TUG (p,V)
SALVAGE TUG
SUBMERSIBLE
WASTE COLLECTION VESSEL
OIL RECOVERY VESSEL
CHEMICAL RECOVERY VESSEL
SERVICE BOAT
ROV
LIVE FISH CARRIER
FISH FARM SUPPORT VESSEL
SELF ELEVATING UNIT
TRAIN FERRY
SUPPLY VESSEL
OFFSHORE SUPPLY VESSEL
WELL STIMULATIONS VESSEL
STAND BY VESSEL
SAR BOAT
CABLE LAYING VESSEL
PIPE LAYING VESSEL

2.5.4 High-speed crafts

2.5.4.1 HSC-Passenger A

High-speed crafts (up to 450 passengers) meeting the requirements of category A in **TL** Construction Rules, Chapter 7 - High Speed Craft are to be given **HSC-PASSENGER A** notation.

2.5.4.2 HSC-Passenger B

High-speed crafts (over 450 passengers) meeting the requirements of category B in **TL** Construction Rules, Chapter 7 - High Speed Craft are to be given **HSC-PASSENGER B** notation.

2.5.4.3 HSC-Cargo

High-speed cargo crafts meeting the requirements of the cargo craft category in **TL** Construction Rules, Chapter 7 - High Speed Craft are to be given **HSC-CARGO** notation.

2.5.4.4 HSDE

High-speed crafts constructed in essential parts according to **TL** Construction Rules, Chapter 7 - High Speed Craft and which are not subject to the IMO HSC Code are to be given **HSDE** notation.

2.5.4.5 Maximum permitted operating conditions

Notations for maximum permitted operating conditions expressed in terms of significant wave height are added to the notations **HSC-PASSENGER A, HSC-PASSENGER B, HSC-CARGO** and **HSDE** as follows:

OC1	Smooth sea service	$H_s \leq 0.5$ m
OC2	Moderate environment service	$H_s < 2.5$ m
OC3	Restricted open sea service:	$H_s < 4.0$ m
OC4	Open sea service	$H_s \geq 4.0$ m

H_s = Significant wave height.

Fast ships not subject to IMO-Res. MSC.36(63), but examined in accordance with the Construction Rules Chapter 7 - High Speed Craft, Section 3, are assigned the class notations **OC1** to **OC4** only.

2.6 Survey scheme

All oil tanker, product tanker, chemical tanker and bulk carrier (≥ 500 GT) notations are always completed by the additional class notation **ESP**, which means that the ship's hull and piping in way of cargo area is to be surveyed according to enhanced survey program (See also UR Z11).

The ship type notation **OIL TANKER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with integral tanks and intended primarily to carry oil in bulk. This type notation shall be assigned to tankers of both single and double hull construction, as well as tankers with alternative structural arrangements, e.g. mid-deck designs.

Note:
Oil Tankers that do not comply with MARPOL I/19 may be subject to International and/or National Regulations requiring phase out under MARPOL I/20 and/or MARPOL I/21.

The ship type notation **BULK CARRIER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended primarily to carry dry cargoes in bulk.

The ship type notation **ORE CARRIER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with single deck, two longitudinal bulkheads and a double bottom throughout the cargo length area and intended primarily to carry ore cargoes in the centre holds only.

"Combination carrier" is a general term applied to ships intended for the carriage of both oil and dry cargoes in bulk; these cargoes are not carried simultaneously, with the exception of oily mixture retained in slop tanks.

The ship type notation **ORE/OIL CARRIER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with single deck, two longitudinal bulkheads and a double bottom throughout the cargo length area and intended primarily to carry ore cargoes in the centre holds or of oil cargoes in centre holds and wing tanks.

Note:
ORE/OIL carriers that do not comply with MARPOL I/19 may be subject to International and/or National Regulations requiring phase out.

The ship type notation **OIL/BULK/ORE (OBO) CARRIER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks, and with single or double side skin construction in the cargo length area, and intended primarily to carry oil or dry cargoes, including ore, in bulk.

Note:
OIL/BULK/ORE carriers that do not comply with MARPOL I/19 may be subject to International and/or National Regulations requiring phase out.

The ship type notation **CHEMICAL TANKER**, or equivalent, and the notation **ESP** shall be assigned to sea going self-propelled ships which are constructed generally with integral tanks and intended primarily to carry chemicals in bulk. This type notation shall be assigned to tankers of both single or double hull construction, as well as tankers with alternative structural arrangements.

2.7 Damage stability

2.7.1 General notation

Ships which proof of subdivision and damage stability is required are to be given **FS** notation (Except Yachts and Inland Waterway Vessels).

2.8 Yachts

2.8.1 Yacht types

2.8.1.1 Sailing yacht

Yachts having no means of propulsion other than sails are to be given **SAILING YACHT** notation.

2.8.1.2 Motor yacht

Yachts propelled by internal combustion engines are to be given **MOTOR YACHT** notation.

2.8.1.3 Motor sailer

Yachts having sails as main means of propulsion which may also be propelled by internal combustion engines are to be given **MOTOR SAILER** notation.

Table 2.3 Summary of mandatory class notations

Class notation	Description
+	Main class notation indicating that hull, machinery and/or special equipments constructed under supervision of TL and with certification by TL of components and materials to be examined in compliance with TL Rules.
(+)	Main class notation indicating that hull, machinery and/or special equipments constructed under supervision of **TL** and without certification by **TL** of components and materials to be examined in compliance with **TL** Rules.
[+]	Main class notation indicating that hull, machinery and/or special equipments constructed under supervision of and in accordance with the rules of another recognised classification society and later assigned class with **TL**.
No notation	**+**, **(+)** or **[+]** notations are not present in front of main class notations in case hull, machinery and/or special equipments are not constructed under supervision of **TL** or another recognised classification society but later assigned class by **TL**
1 A 5	Main class notation indicating that the ship's hull fully complies with the construction rules of **TL** or the other rules accepted as equivalent. Duration of class period is 5 years.
1 A 3 **1 A 2** **1 A 1**	In case the ship's hull does not comply with the construction rules of **TL** or doesn't meet the mandatory requirements for compliance, class period may be reduced together with survey intervals. 3,2,1 coming after "A" on main class notations express the class period as year.
M	Main class notation indicating that the ship's machinery including electrical installations comply with the construction rules of **TL** or the other rules accepted as equivalent.
T-M	Main class notation indicating that non-self-propelled vessel's and floating unit's machinery including electrical installations comply with the Construction Rules of **TL** or other rules accepted as equivalent.
[M] **[T-M]**	Main class notation indicating that ship's machinery including electrical installations does not fully comply with the requirements of **TL** Construction Rules but functional safety and seaworthiness are ensured for the envisaged service.
Y	Additional class notation for restricted international service. This range of service is limited, in general, to trade along the coast, provided that the distance to the nearest port of refuge and the offshore distance do not exceed **200** nautical miles, and moreover additional class notation indicating that ship is allowed to trade in the North Sea and within enclosed seas, such as the Mediterranean, the Black Sea and waters with similar seaway conditions.
K50 **K20**	Additional class notation for coastal service.This range of service is limited, in general, to trade along the coasts, provided that the distance to the nearest port of refuge and the offshore distance do not exceed **50/20** nautical miles, respectively, and moreover additional class notations indicating that ship is allowed to trade within enclosed seas, such as the Baltic Sea, Marmara Sea and gulfs with similar seaway conditions.
K6	Additional class notation for coastal service. Service range is limited for material other than steel passenger ships to trade along the coasts, provided that the distance to the nearest port of refuge and the offshore distance do not exceed **6** nautical miles. This area of service is restricted to trade in shoals, bays, haffs and firths or similar waters, where heavy seas do not occur.
L1	Additional class notation for harbour service. This range of service is limited to trade in harbours whose boundaries fixed by flag state, provided that to stay in the range of L2. This additional class notation is only assigned to the ships operating within the cabotage of the state.

Class notation	Description
L2	Additional class notation for harbour service. This range of service is limited to trade in harbours not exceeding 10 nautical miles to safe anchorage and not exceeding 100 nautical miles to the port of departure. This additional class notation is only assigned to the ships operating within the cabotage of the state.
I	Additional class notation assigned to the inland vessels intended for navigation in inland waters only and complying with the **TL** Rules, Chapter 19 - Inland / Coastal Ships.
PASSENGER SHIP	Additional class notation assigned to the ships carrying more than 12 passengers and ships complying with the construction rules for the carriage and/or accommodation of passengers and with the applicable requirements of the Chapters II-1 and II-2 of the SOLAS Convention Exemptions from these requirements may be granted only within the framework of options given therein and are subject of approval by the competent flag state.
RO-RO PASSENGER SHIP	Additional class notation assigned to the ships complying with the construction and safety rules for the carriage of passengers and specially equipped for carriage of wheeled vehicles and trains.
PASSENGER SHIP-CLASS A/B/C/D **RO-RO PASSENGER SHIP-CLASS A/B/C/D**	Additional class notations assigned to passenger ships and Ro-Ro passenger ships intended to operate within domestic waters, provided that rules harmonized to EU Directive are applied.
(….) PASSENGER VESSEL	Additional class notation for the passenger ships constructed of non-steel materials according to the current rules related with accommodation and carriage of more than 12 passengers safely.
GENERAL CARGO SHIP	Additional class notation assigned to the ships constructed for the carriage of general cargo which will not be carried in containers.
CONTAINER SHIP	Additional class notation assigned to the ships equipped with appropriate facilities and aimed especially for carriage of containers.
EQUIPPED FOR CARRIAGE OF CONTAINERS	Additional class notation assigned to the ships carrying containers occasionally or as part cargo only and provided with appropriate facilities.
OPEN TOP	Additional class notation for ships having no hatch covers equipped with appropriate facilities.
EQUIPPED FOR CARRIAGE OF CARS	Additional class notation assigned to the ships provided with special equipment for carriage of (non-loaded) motor vehicles, e.g. floating decks etc.
RO-RO SHIP	Additional class notation assigned to the ships equipped with ramps and possibly shell doors and strengthened in accordance with the **TL** Construction Rules for the motor vehicles to enter the ship and to be carried (without passengers).
MULTI-PURPOSE DRY CARGO SHIP	Additional class notation assigned to the ships constructed for carriage of dry and bulk cargo.
LIVESTOCK CARRIER	Additional class notation assigned to the ships constructed and equipped for carriage of livestock.
BULK CARRIER	Additional class notation assigned to the ships designed for carriage of solid bulk cargoes and comply with **TL** Rules, Chapter 1 - Hull, Section 27.

Class notation	Description
BC-C	Additional class notation assigned to the bulk carriers with length of 150 m or longer contracted for construction on 1 July 2003 or later and complying with the TL Rules, Chapter 1 - Hull, Section 27; based on loading conditions, cargo hold loading etc. For bulk carriers designed to carry dry bulk cargoes of cargo density less than 1,0 t/m3 are to be given BC-C notation.
BC-B	Additional class notation assigned to the bulk carriers with length of 150 m or longer contracted for construction on 1 July 2003 or later and complying with the TL Rules, Chapter 1 - Hull, Section 27; based on loading conditions, cargo hold loading etc. For bulk carries designed to carry dry bulk cargoes of cargo density of 1.0 t/m3 and above with all cargo holds loaded in addition to BC-C conditions are to be given BC-B notation.
BC-A	Additional class notation assigned to the bulk carriers with length of 150 m or longer contracted for construction on 1 July 2003 or later and complying with the TL Rules, Chapter 1 - Hull, Section 27; based on loading conditions, cargo hold loading etc. For bulk carries designed to carry dry bulk cargoes of cargo density 1,0 t/m3 and above with specified holds empty at maximum draught in addition to BC-B conditions are to be given BC-A notation.
{no MP}	Additional class notations assigned to the bulk carriers with additional class notations **BC-A** and **BC-B**, provided that maximum cargo density is less than 3,0 t/m3'
{MAXIMUM CARGO DENSITY … t/m3}	Bulk carriers with notations BC-A and BC-B designed for a maximum cargo density x.y [t/m^3]
{HOLDS a, b, … MAY BE EMPTY}	Additional class notation assigned to bulk carriers assigned with BC-A.
GRAB [X]	Bulk carriers whose double bottom strengthened for grab loading and discharging with grab mass equal to or greater than 20 t where X gives the grab mass in t.
ORE CARRIER	Additional class notation assigned to the ships designed for carriage of bulk cargo and ore respectively and strengthened according to the **TL** Rules, Chapter 1 - Hull.
CEMENT CARRIER	Additional class notation assigned to the ships constructed for carriage of cement and provided with relevant cargo handling equipment.
OIL TANKER **PRODUCT TANKER** **OIL TANKER / PRODUCT TANKER**	Additional class notation for the ships designed for the carriage of oil/oil products in bulk and complying with the **TL** Rules, Chapter 1 - Hull, Section 28
CHEMICAL TANKER TYPE 1/2/3	Additional class notation assigned to the ships designed for carriage of liquid chemical bulk cargoes and comply with the **TL** Rules, Chapter 8 - Chemical Tankers.
LIQUEFIED GAS TANKER	Additional class notation assigned to the ships designed for carriage of liquefied gas cargoes in bulk and comply with the **TL** Rules, Chapter 10 - Liquefied Gas Tankers.
ASPHALT TANKER **SPECIAL TANKER** **EDIBLE OIL TANKER**	Additional class notations for tankers comply with the relevant rules and carrying special cargo.

Class notation	Description
WINE TANKER **WATER TANKER** **FRUIT JUICE TANKER**	
BULK CARRIER / PRODUCT TANKER **BULK CARRIER / OIL TANKER** **ORE CARRIER / PRODUCT TANKER** **ORE CARRIER / OIL TANKER**	Additional class notation assigned to the ships complying with the rules related to carriage of dry bulk cargo or liquid bulk cargo alternatively.
FISHING VESSEL	Additional class notation assigned to the ships complying with the **TL** Rules, Chapter 14 - Fishing Vessels.
FLOATING DOCK Lifting capacity … t	Additional class notation indicating the lifting capacity in tonnes and complies with the **TL** Rules, Chapter 1 - Hull, Section 35.
HSC-PASSENGER A	Additional class notation assigned to the ships (up to 450 passengers) meeting the requirements of Category A according to **TL** Rules, Chapter 7 - High Speed Crafts.
HSC-PASSENGER B	Additional class notation assigned to the ships (over 450 passengers) meeting the requirements of Category A according to **TL** Rules, Chapter 7 - High Speed Crafts.
HSC-CARGO	Additional class notation assigned to the ships meeting the requirements "Cargo Craft" according to **TL** Rules, Chapter 7 - High Speed Crafts.
HSDE	Additional class notation assigned to the ships complying the main parts of **TL** Rules, Chapter 7 - High Speed Crafts but not being subject to the IMO HSC Code.
DSC	Additional class notation assigned to the ships which were built before 1994 complying the main parts of **TL** Rules, Chapter 7 - High Speed Vessels (1993) and subject to the IMO DSC Code.
OC1 **OC2** **OC3** **OC4**	Additional class notations related with maximum permitted operating conditions and expressed in terms of significant wave height are added to additional class notations **HSC-PASSENGER A**, **HSC-PASSENGER B**, **HSC-CARGO**, and **HSDE.** To the ships not being subject to IMO Res. MSC. 36(63) but controlled according to **TL** Rules (Chapter 7 - High Speed Crafts, Section 3), only additional class notation OC1 ÷ OC4 is assigned.
BARGE **HOPPER BARGE** **HOPPER DREDGER** **PUSHER/BARGE** **PUSHER** **FLOATING CRANE** **PONTOON CRANE** **HYDROFOIL** **ICE-BREAKER** **PILOT BOAT** **PONTOON** **RESCUE VESSEL** **RESEARCH VESSEL** **SPECIAL PURPOSE SHIP**	Additional class notations assigned to the other ships and/or floating units designed, constructed and/or equipped for their special purposes.

Class notation	Description
DREDGER **SUCTION DREDGER** **BUCKET DREDGER** **CUTTER SUCTION DREDGER** **BACKHOE DIPPER DREDGER** **TUG** **ESCORT TUG (p,V)** **SALVAGE TUG** **SUBMERSIBLE** **WASTE COLLECTION VESSEL** **OIL RECOVERY VESSEL** **CHEMICAL RECOVERY VESSEL** **SERVICE BOAT** **ROV** **LIVE FISH CARRIER** **FISH FARM SUPPORT VESSEL** **SELF ELEVATING UNIT** **TRAIN FERRY** **SUPPLY VESSEL** **OFFSHORE SUPPLY VESSEL** **WELL STIMULATIONS VESSEL** **STAND BY VESSEL** **SAR BOAT** **CABLE LAYING VESSEL** **PIPE LAYING VESSEL**	
ESP	Ship's hull structure and piping in cargo area is to be surveyed according to enhanced survey program. (Additional class notation assigned to all oil tankers, product tankers, chemical tankers and bulk carriers ≥ 500 GRT)
FS	Main class notation assigned to the ships (except for yachts and inland water ships) for which subdivision and damage stability is proved.
SAILING YACHT	Main class notation assigned to the yachts propelled only by sail.
MOTOR YACHT	Main class notation assigned to the yachts propelled by internal combustion engines.
MOTOR SAILER	Main class notation assigned to the yachts propelled by both sail and also propelled by internal combustion engines
MULTI-POINT MOORING SYSTEM	**MULTI-POINT MOORING SYSTEM** notation will be assigned to the multi-point mooring systems constructed under supervision of **TL** and according to the rules related to Rules of **TL** Chapter 70 - Multi-Point Mooring Systems.

2.9 Multi-point mooring system

Multi point mooring systems built in accordance with **TL** Rules and under **TL** survey are to be given **MULTI-POINT MOORING SYSTEM** notation.

3. Optional Class Notations

3.1 General

Ships classed by **TL** may be given optional class notation related to cargo, service area, design features, survey schemes, equipment or systems meeting corresponding rule requirements.

3.2 Class notations related to cargo

3.2.1 Carriage of dangerous goods

3.2.1.1 Ships equipped for the carriage of dangerous goods in accordance with relevant **TL** rules and SOLAS II-2, Reg. 19 are to be given **DG** notation.

3.2.1.2 High speed crafts equipped for the carriage of dangerous goods in accordance with relevant TL rules and HSC Code 7.17 are to be given **DG (HSC Code 7.17)** notation.

3.2.1.3 Ships equipped for the carriage of solid bulk cargoes in accordance with relevant **TL** rules and IMSBC Code are to be given **DBC** notation.

3.2.1.4 Ships equipped for the carriage of high level radioactive goods in accordance with INF Code are to be given **INF 1, INF 2** or **INF 3** notations.

3.2.1.5 Oil tankers complying with MARPOL Annex II requirements for Noxious Liquid Substance (NLS) certificate are to be given **NLS** notation.

3.2.1.6 Offshore Supply vessels complying with the requirements of IMO Resolutin A.673(16) "Guidelines for the Transport Handing of Limited Amounts of Hazardous and Noxious Liquid Sunstances in Bulk in Offshore Support Vessels" as amended by IMO Resolution MSC.236(82) and MEPC.158(55) are to be given **HNLS** notation.

3.2.2 Special strengthening

3.2.2.1 Heavy cargo

Ships provided with strengthening recommended by **TL** in accordance with the **TL** Construction Rules, unless complying with the requirements of the notations "bulk carrier" or "ore carrier" are to be given **STRENGTHENED FOR HEAVY CARGO** notation.

3.2.2.2 Use of grabs

Ships with inner bottoms and/or coamings and longitudinal bulkheads strengthened for the use of grabs in accordance with the **TL** Construction Rules are to be given **G** notation.

3.2.3 Cargo refrigerating installations (cargo ships)

3.2.3.1 Both in respect of hull and machinery, ships having the cargo refrigerating installation complying with the requirements of **TL** rules are to be given **YST** notation.

3.2.3.2 Ships having the cargo refrigerating installation does not in all respects comply with the requirements of **TL** Rules, but functional safety and seaworthiness are ensured for the envisaged service are to be given **[YST]** notation.

3.2.3.3 Ships with refrigerated cargo installations in cargo areas for the carriage of refrigerated cargo in controlled atmosphere are to be given **RC** notation.

3.2.3.4 Ships with refrigerated cargo installations in cargo areas for the carriage of refrigerated cargo in controlled atmosphere using mobile gas generating systems are to be given **RC MOB** notation.

3.2.3.5 Ships having refrigerated cargo installations which condition monitoring system is used to reliably determine the condition of their components are to be given **CM** notation.

CM1 To reach 3% of the scope of possible condition monitoring system;

CM2 To reach 10% of the scope of possible condition monitoring system;

CM3 To reach 20% of the scope of possible condition monitoring system;

CM4 To reach more than 20% of the scope of possible condition monitoring system.

3.2.4 Cargo refrigerating installations (fishing vessels)

3.2.4.1 Both in respect of hull and machinery, fishing vessels having the cargo refrigerating installation complying with the requirements of **TL** rules are to be given **BST** notation.

3.2.4.2 Fishing vessels having the cargo refrigerating installation does not in all respects comply with the requirements of **TL** Rules, but functional safety and seaworthiness are ensured for the envisaged service are to be given **[BST]** notation.

3.2.4.3 Fishing vessels having refrigerating installation fitted with equipment for quick freezing of wet fish are to be given **QUICK FREEZING** notation.

3.2.5 Cargo refrigerating systems (container ships)

Ships complying with the requirements of **TL** rules relating to carriage of refrigerated ice are to be given **RCP x/y** class notations.

RCP is supplemented by two figures. The first figure (x) stands for the total number of certified refrigerated container stowage positions on deck and in container holds and is related to FEU (forty foot equivalent units). The second figure (y) indicates the percentage of containers carrying fruit/ chilled cargoes for which the ship is certified. Details concerning container size stowage positions and special conditions will be indicated in the Register, if required.

3.3 Class notations related to service area

3.3.1 Ice strengthening

Ships complying with the requirements of **TL** rules relating to strengthening for navigation in ice are to be given **ICE-B4, ICE-B3, ICE-B2, ICE-B1** or **ICE-B** class notations.

Index 4 represents the highest notation. Notations ICE-B4 to ICE-B1 corresponding to ice classes IA Super to IC of the Finnish/ Swedish Ice Class Rules as amended.

Ships complying with the requirements of **TL** rules relating to navigation in polar ice-covered waters are to be given **PC1, PC2, PC3, PC4, PC5, PC6** or **PC7** notations. Index 1 represents the highest notation. Notations PC1 to PC7 are based on the IACS Unified Requirements for Polar Ships.

3.3.2 BF

Fishing ships complying with the requirements of TL rules relating to hull and machinery installations for navigation in waters around and/or comparable to Greenland ve Labrador ice are to be given **BF** class notation.

3.4 Class notations related to survey schemes

3.4.1 In-water surveys

Ships with its hull is specially prepared and equipped for in-water surveys are to be given **IWS** notation.

3.4.2 Ballast water management

Ships complying with the Guidelines on Ballast Water Management are to be given **BWM** notation.

3.4.3 Emergency response service

Ships, the geometry and structural data of which are made available in a database to provide the assistance necessary for limiting damages in case of average with the aid of special computer programs are to be given **ERS** notation.

3.4.4 Condition monitoring of propeller shaft at stern tube

Ships complying with the relevant **TL** rules with its propeller shaft runs within the stern tube in oil, the possibility exits, to prolong the intervals between shaft withdrawals are to be given **CM-PS** notation.

3.4.5 Hull Inspection and Maintenance Program

Ships complying with “Rules for Türk Loydu Hull Inspection and Maintenance Program” are to be given **HP** notation.

3.5 Class notations related to design features

3.5.1 Material

Ships constructed of materials other than ordinary hull structural steel are to be given, e.g., the following notations:

HIGHER STRENGTH
HULL STRUCTURAL STEEL
ALUMINIUM
FRP
WOODEN

3.5.2 Bridge design on seagoing ships

3.5.2.1 Ships, which date of contract for construction before 1st February 2013 and designed in compliance with the rules for Chapter 21 – Navigation Bridge Arrangement and Equipment on Seagoing Ships, One-Man Control Console are to be given notation:

NAV-O Ocean Area,

NAV-OC Ocean Areas and Coastal Waters

3.5.2.2 Ships which date of contract for construction on or after 1st February 2013, and designed in compliance with the rules for and Chapter 21 - Navigation Bridge Visibility, Bridge Arrangement and Equipment Rules are to be given notation:

NAV Designed in compliance with Chapter 21 and equipped with Chapter 21, Section 4, B.1.

NAV-INS Integrated Navigation Systems, Designed in compliance with Chapter 21 and equipped with Chapter 21, Section 4, B.2, and C.

3.5.3 Environmental standards

Ships complying with the requirements of **TL** rules Chapter 76 - Environmental Service System are to be given **EP** notation.

3.5.4 Fuel cell systems

3.5.4.1 Ships with fuel cell systems the nominal power of which is equal or exceeds 10% of the total nominal power of the machinery installation (excluding the emergency supply power) and complying with **TL** Rules, Chapter 26 - Use of Fuel Cell Systems on Board of Ships are to be given **FC-xxx** notation.

"xxx" means the percentage of the fuel cell system related to the nominal power of the machinery installation.

3.5.4.2 Ships with fuel cell systems the nominal power of which is below 10% of the nominal power of the machinery installation are to be given **with FC** notation.

3.5.5 Novel designs

Ships, machinery installations or essential parts constructed in accordance with a design, for which sufficient experience is not available are to be given **EXP** notation. **TL** will decide at what intervals the required periodical surveys will have to be carried out.

Where experience over a prolonged period of time had proved the efficiency of the design, the notation **EXP** may be cancelled.

3.6 Class notations related to equipment and systems

3.6.1 Automation

Ships having machinery installations which comply with the requirements of **TL** rules for automation are to be given one of the following notations:

3.6.1.1 Ships having machinery installation fitted with equipment for unattended machinery spaces, so that it does not require to be operated and/or maintained for periods of at least 24 hours are to be given **AUT** notation.

3.6.1.2 Ships having machinery installation, the period during which attendance to and maintenance of equipment is not required, is less than 24 hours, are to be given **AUT-nh** notation. nh indicates that the machinery space may remain unattended for n hours

3.6.1.3 Ships having machinery installation operated with the engine control room permanently attended (centralized control) and is equipped with a system for remote control of the main propulsion plant from the bridge or arrangements for manoeuvring from the engine control room are to be given **AUT-C** notation.

3.6.1.4 Ships provided with a system for remote control of the main propulsion plant from the bridge are to be given **R** notation.

3.6.2 Dynamic positioning system

Ships complying with the requirements of **TL** rules Chapter 22 - Dynamic Positioning Systems, depending on the desired system reliability and on the basis of a risk analysis, are to be given one of the following notations.

- **DK1** Non-redundant

- **DK2** Redundant

- **DK3** Redundant, separate compartments

3.6.3 Inert gas systems

Ships equipped with an inert gas system in accordance with the relevant **TL** rules, or with a system recognized as being equivalent in design are to be given **INERT** notation.

3.6.4 Fire fighting

Ships fitted with equipment complying with the **TL** rules for Fire-Fighting Ships are, depending on the size and purpose of the equipment provided, to be given one of the following notations:

3.6.4.1 Ships provided with equipment for fighting fires in the initial stage and performing rescue operations in the immediate vicinity of the installation on fire are to be given **FF1** notation.

3.6.4.2 Ships provided with equipment for sustained fighting of large fires and for cooling parts of the installation on fire are to be given FF2 notation.

3.6.4.3 Ships provided with equipment corresponding to FF2, but with greater fire-extinguishing capacity and more comprehensive fire-extinguishing equipment are to be given **FF3** notation.

3.6.4.4 Ships provided with equipment corresponding to FF2 or FF3 and additionally suited for rescue operations as per FF1 are to be given **FF1/2** or **FF1/3** notation.

3.6.5 Redundant propulsion and steering system

Ships with propulsion and steering systems which meet the redundancy requirements of **TL** for these systemsare to be given one of the following notations.

3.6.5.1 Ships having at least two propulsion machines, which are independent or can be separated form each other are to be given **RP1x%** notation. This also applies to the auxiliary systems which are needed to operate the propulsion machines. No redundancy of propeller, shaft line, gearbox and steering system is required.

3.6.5.2 Ships having at least two propulsion systems and two steering systems, each of which are independent or can be separated from each other are to be given **RP2x%** notation. This also applies to each of the auxiliary systems which are needed to operate the propulsion and/or steering systems.

3.6.5.3 Ships having at least two propulsion systems and two steering systems, each of which are independent or can be separated from each other and are installed in separate compartments are to be given **RP3x%** notation. This also applies to each of the auxiliary systems which are needed to operate the propulsion and/or steering systems.

The additional index x% denotes what percentage of the main propulsion power of the ship is provided by the redundant ship's propulsion system.

3.6.6 Anchor handling

Ships complying with the requirements of relevant **TL** rules are to be given **AH** notation.

3.6.7 Hatchcover tightness system

Ships equipped with an approved additional hatchcover tightness system are to be given **AHTS** notation.

3.6.8 Diving systems

Diving system complies with the requirements of **TL** rules; Chapter 52 - Diving systems are to be given **TAZ** notation.

3.6.9 Cargo reliquefaction installations (liquefied gas tankers)

Ships carrying liquefied gases and equipped with systems for cooling (reliquefaction) of their cargoes in accordance with the **TL** rules are to be given **GST** notation.

3.6.10 Bow rudder

Ships equipped with bow rudder are to be given **EQUIPPED WITH BOW RUDDER** notation.

Table 2.4 Summary of optional class notations

Class Notation	Description
DG	Additional class notation assigned to ships equipped for carriage of dangerous goods in accordance with SOLAS II-2, Regulation 19 and TL Rules.
DG (HSC Code 7.17)	Additional class notation assigned to high speed crafts equipped for the carriage of dangerous goods in accordance with relevant TL rules and HSC Code 7.17.
DBC	Additional class notation assigned to ships equipped for the carriage of solid bulk cargoes in accordance with relevant TL rules and IMSBC Code.
INF 1 **INF 2** **INF 3**	Additional class notation assigned to ships equipped for the carriage of packaged irradiated nuclear fuel, plutonium and high level radioactive goods in accordance with INF Code.
NLS	Additional class notation assigned to oil tankers complying with MARPOL Annex II requirements for Noxious Liquid Substance (NLS) certificate.
NOT SUITABLE FOR CARGO WITH FLASHPOINT 60 °C AND LESS	
HNLS	Additional class notation assigned to offshore supply vessels complying with the requirements of IMO Resolution A.673(16) “Guidelines for the Transport Handing of Limited Amounts of Hazardous and Noxious Liquid Substances in Bulk in Offshore Support Vessels”.
STRENGTHENED FOR HEAVY CARGO	Additional class notation assigned to ships strengthened in direction of recommendations made by TL according to the Construction Rules excluding compliance with the requirements related to additional class notations "Bulk carrier" or "Ore carrier" .
EQUIPPED WITH BOW RUDDER	Additional class notation for ships equipped with bow rudder.
CSR	Rules of “IACS Common Structural Rules for Bulk Carriers” and “IACS Common Structural Rules for Double Hull Oil Tankers” are applied for structural design of bulk carriers with a length of 90 m or above and tankers with a length of 150 m or above. CSR additional class notation is assigned to such ships.
LAID-UP SHIP	Additional class notation indicating that ship is laid up temporarily.
…-Domestic Service	Additional class notation indicating service range for the ships constructed according to directives published for the ships operating within only domestic waters of relevant flag state or having exemptions to operate in domestic service granted by flag state. (e.g. TR-Domestic service)
HELIW	Additional class notation for ships equipped for helicopter winch operation.
HELIL	Additional class notation for ships equipped with helicopter landing deck.
HELILF	Additional class notation for ships equipped with helicopter landing deck and ability to supply fuel.
ACCOM	Additional class notations assigned to ships complying with TL Rules, Chapter 1 - Hull, Section 2. (Including MLC 2006)

Class Notation	Description
ACCOM +	Additional class notations assigned to ships complying with TL Rules, Chapter 1 - Hull, Section 2. (Including MLC 2006)
G	Additional class notation assigned to bulk carriers complying with the requirements of TL Construction Rules related with strengthening of inner bottom and/or coamings and longitudinal bulkheads in case of using of grabs.
YST	Additional class notation assigned to ships with cargo refrigerating installation fully complying with TL Rules or other rules accepted as equivalent both in respect of hull and machinery.
[YST]	Additional class notation assigned to ships with cargo refrigerating installation not fully complying with TL Rules but ensuring functional safety and seaworthiness for the envisaged service.
RC	Additional class notation for cargo refrigerating installations in cargo areas in which of refrigerated cargo is carried in controlled atmosphere.
RC mob	Additional class notation for cargo refrigerating installations in cargo areas in which refrigerated cargo is carried in controlled atmosphere using mobile gas generating systems.
CM1 **CM2** **CM3** **CM4**	Additional class notations assigned to cargo ships having cargo refrigerating installations in which condition monitoring system is used to reliably determine the condition of their components. CM1 = Up to 3 % of the possible condition monitoring scope is achieved. CM2 = Up to 10 % of the possible condition monitoring scope is achieved. CM3 = Up to 20 % of the possible condition monitoring scope is achieved. CM4 = Over 20 % of the possible condition monitoring scope is achieved.
BST	Additional class notation indicating that cargo refrigerating installations fully comply both in respect of hull and machinery with the TL Rules, Chapter 14 - Fishing Vessels or rules accepted as equivalent.
[BST]	Additional class notation indicating that cargo refrigerating installations do not fully comply with the TL Rules, Chapter 14 - Fishing Vessels but ensure functional safety and seaworthiness for the envisaged service.
QUICK FREEZING	Additional class notation assigned in addition to main class notation of fishing vessels having mandatory equipment for the wet fish to be quick frozen in compliance with TL Rules, Chapter 14 - Rules for Fishing Vessels .
RCP x/y	Additional class notation related with ships whose compliance with TL Rules, Chapter 29 - Carriage of Refrigerated Containers on Board is proved. Two digits are added to RCP additional class notation. First digit (x); indicates total number of certificated refrigerated containers arranged on deck and in container holds and corresponds to FEU (unit equivalent to forty feet) Second digit (y), indicates the ratio of containers carrying fruit/refrigerated cargo for which ship has been certificated. Container dimensions, positioning locations and special conditions are to be defined in Classification Annex (in page 2), if necessary.

Class Notation	Description
ICE-B4 **ICE-B3** **ICE-B2** **ICE-B1** **ICE-B**	Hull and machinery installation is designed in compliance with the mandatory requirements for navigation within iced waters. Index 4 represents the highest notation. Additional class notations ICE-B4 to ICE-B1 corresponding to ice classes IA Super to IC of the Finnish/ Swedish Ice Class Rules as amended.
PC1 **PC2** **PC3** **PC4** **PC5** **PC6** **PC7**	Additional class notations assigned to ice breakers constructed in accordance with mandatory construction rules for ships navigating in ice-covered waters in polar zones and assigned to the cargo ships with ice breaking ability and relevant machinery equipments. Index 1 represents the highest notation. Notations PC1 to PC7 are based on the IACS Unified Requirements for Polar Ships.
BF	Additional class notation indicating that hull and machinery installations of fishing vessels navigating within the waters around Greenland and Labrador Peninsula and/or waters corresponding to them are designed in compliance with TL Rules.
IWS	Additional class notation assigned to ships with its hull is specially prepared and equipped for in-water surveys
BWM	Additional class notation assigned to ships complying with the Guidelines on Ballast Water Management
ERS	Additional class notation assigned to ships storing the geometrical and structural data in a database to provide the assistance necessary for limiting damages in case of average with the aid of special computer programs.
CM-PS	Additional class notation assigned to ships with propeller shafts operating in oil within the stern tubes for prolongation of the intervals between shaft withdrawals, if possible, in case relevant TL Rules are complied.
HP	Additional class notation assigned to ships complying with “Rules for Türk Loydu Hull Inspection and Maintenance Program”.
HIGHER STRENGTH HULL STRUCTURAL STEEL **ALUMINIUM** **FRP** **WOODEN**	Additional class notations assigned to the ships constructed of materials except for normal hull construction steel.
NAV-O **NAV-OC**	Additional class notation assigned to ships, which date of contract for construction before 1st February 2013, and complying with the requirements in Chapter 21 - Bridge Design on Sea Going Ships, One-Man Control Console. NAV-O Ocean Area, NAV-OC Ocean Areas and Coastal Waters
NAV **NAV-INS**	Additional class notation assigned to ships which date of contract for construction on or after 1st February 2013, and complying with the requirements in Chapter 21 - Navigation Bridge Visibility, Bridge Arrangement and Equipment Rules are to be given notation: NAV Designed in compliance with Chapter 21 and equipped with Chapter 21, Section 4, B.1. NAV-INS Integrated Navigation Systems, Designed in compliance

Class Notation	Description
	with Chapter 21 and equipped with Chapter 21, Section 4, B.2, and C.
EP	Additional class notation assigned to ships complying with the requirements in TL Rules, Chapter 76 - Environmental Service System.
FC-xxx	Additional class notation for watercraft with fuel cell systems the nominal power of which is equal or exceeds 10 % of the total nominal power of the machinery installation (excluding the emergency supply power) and complying with TL Rules Chapter 26 - Use of Fuel Cell Systems on Board of Ships, "xxx" means the percentage of the fuel cell system related to the nominal power of the machinery installation.
with FC	Additional class notation related with fuel cell systems with nominal power less than 10% of the nominal power of machinery installation.
EXP	Additional class notation for ship, machinery installations or essential parts having been constructed in accordance with a design, for which sufficient experience is not available. TL is to decide about the interval of surveys. EXP notation may be abolished in case experiences prove the consistency of design within time.
AUT	Additional class notation assigned to ships provided with machinery installation and relevant equipment not requiring personnel for being operated and/or maintained at least for 24 hours.
AUT-nh	Additional class notation assigned to ships provided with machinery installation not requiring being supervised and maintained at least for 24 hours. nh indicates that machinery spaces may be unattended for n hours.
AUT-C	Additional class notation assigned to ships with machinery facilities operated from engine control room (central control) which is permanently under supervision and with main propulsion equipment remote controlled from bridge or to ships fitted with equipment capable of being manoeuvred from engine control room by necessary facilities
R	Additional class notation assigned to ships equipped with a system capable of controlling main propulsion system from bridge by remote control.
DK1 **DK2** **DK3**	Ships complying with TL Rules, Chapter 22 - Dynamic Positioning Systems. Three additional class notations may be assigned depending on envisaged system reliability and based on risk analysis: DK1 = Non-redundant DK2 = Redundant DK3 = Redundant, separate compartments
WITH FREEBOARD ... m	Additional class notation assigned to ships whose hull is dimensioned for a draught of less than the maximum draught permissible according to the Load Line Convention".
INERT	Additional class notation assigned to ships equipped with an inert gas system complying with the TL Construction Rules or with a system recognized as being equivalent in design.
FF1	Additional class notation assigned to ships provided with necessary

Class Notation	Description
	equipment for fighting fires in the initial stage and performing rescue operations in the immediate vicinity of the installation on fire.
FF2	Additional class notation assigned to ships provided with equipment for sustained fighting of large fires and for cooling parts of the installation on fire.
FF3	Additional class notation assigned to ships provided with equipment corresponding to FF2, but with greater fire-extinguishing capacity and more comprehensive fire-extinguishing equipment.
FF1/2 **FF1/3**	Additional class notation assigned to ships having equipment corresponding to FF2 or FF3 or additionally being capable of performing rescue operations defined in FF1.
RP1x%	Additional class notation assigned to ships having at least two propulsion machines, which are independent or can be separated from each other. This also applies to the auxiliary systems which are needed to operate the propulsion machines. No redundancy of propeller, shaft line, gearbox and steering system is required.
RP2x%	Additional class notation assigned to ships having at least two propulsion systems and two steering systems, each of which are independent or can be separated from each other. This also applies to each of the auxiliary systems which are needed to operate the propulsion and/or steering systems.
RP3x%	Additional class notation assigned to ships having at least two propulsion systems and two steering systems, each of which are independent or can be separated from each other and are installed in separate compartments. This also applies to each of the auxiliary systems which are needed to operate the propulsion and/or steering systems.
AH	Additional class notation AH is assigned to ships intended to be used for anchor handling in open sea facilities in compliance with TL Rules Chapter 1 - Hull, Section 32.F.
AHTS	Additional class notation assigned to ships equipped with an approved additional hatch cover tightness system.
GST	Additional class notation assigned to ships carrying gases as liquefied and having equipment for reliquifying of cargo by cooling and complying with TL Rules, Chapter 10 - Liquefied Gas Tankers
TK	Additional class notation for characteristic implements and/or equipments constructed by agreement under control of TL and in compliance with relevant rules or directives.
TAZ	Additional class notation for special equipment complying with the TL Rules, Chapter 52 - Diving Systems
VEC	Vapour return facilities VEC class notation is to be assigned to tankers equipped with vapour return facilities for the return of volatile organic compounds to the shore during loading operations.
YAUT	Additional class notation assigned to yachts provided with machinery

Class Notation	Description
	installation and relevant equipment not requiring personnel for being operated and/or maintained at least for 24 hours.
YR	Additional class notation assigned to yachts whose main propulsion plant is remote controlled from the bridge and compartments of propulsion engine are supervised.
YSS	Additional class notation assigned to yachts provided with permanent means of total buoyancy or constructional characteristics such as to allow the vessel to float in case of entering of water into the vessel.
YFS	Additional class notation for yachts with at least each subdivision or subdivision group proved by calculations to preserve buoyancy in case of being filled by water in damage condition.
YDA	Sailing yachts having masts and rigging constructed according to the related **TL** rules and classed as special equipment.

3.6.11 Vapour return installations

Tankers equipped with vapour return installations for the return of volatile organic compounds to shore during loading operations are to be given **VEC** notation.

3.6.12 Yachts

Notation for yachts to be given upon application by the owners is as follows:

3.6.12.1 Yachts having machinery installation fitted with equipment for unattended machinery spaces, so that it does not require to be operated and/or maintained for periods of at least 24 hours are to be given **YAUT** notation.

3.6.12.2 Yachts provided with a system for remote control of the main propulsion plant from the bridge are to be given **YR** notation.

3.6.12.3 Yachts provided with permanent means of total buoyancy or constructional characteristics such as to allow the vessel to float are to be given **YSS** notation.

3.6.12.4 Yachts which proof of subdivision and damage stability is required are to be given **YFS** notation.

3.6.12.5 Sailing yachts having masts and rigging constructed according to the related **TL** rules and classed as special equipment are to be given **YDA** notation.

E. Certification of Materials, Machinery and Equipment

1. General

1.1 For the classification of new constructions specified materials, machinery and equipment used in ships to be classed by **TL** are to be certified according to **TL** rules.Certification includes both plan approval (if required) and survey during production and/or of the final product.

1.2 The applicable chapters of the rules and guidelines define the extent and details of certification required for classification.

2. Requirements to be Met by the Manufacturer

2.1 Manufacturers of materials, machinery and equipment are to be considered for approval according to criteria established by **TL**.

2.2 Quality control of materials, machinery and equipment to be certified is to be traceable and documented.

3. Certification Procedure

3.1 General

3.1.1 Certification of materials, machinery and

equipment is to be documented by **TL** product certificate, **TL** type approval certificate, works certificate and test report.

3.1.1.1 **TL** product certificate signed by **TL** surveyor is a certificate stating conformity with rule requirements that tests are carried out on the certified product itself, that tests are made on samples taken from the certified product itself and that tests are performed in presence of the surveyor or in accordance with special agreements.

3.1.1.2 **TL** type approval certificate is to be issued when compliance with the design requirements is confirmed. Type approval procedure is normally used for approval of standard designs and/or mass produced components. Type approval procedure may consist of plan approval, initial survey and type testing.

3.1.1.3 Works certificate signed by the manufacturer is a certificate stating conformity with rule requirements that tests are carried out on the certified product itself, that tests are made on samples taken from the certified product itself and that tests are witnessed and signed by manufacturer's quality control department.

3.1.1.4 Test report signed by the manufacturer is a document stating conformity with the rule requirements and that tests are carried out on samples from the current production.

3.1.2 Where work certificate or test report is required, the surveyor may, at any time, require the tests to be carried out in his presence.

3.1.3 Certified products are to be properly marked for identification and traceability.

3.2 Plan approval

3.2.1 Plan approval of materials, machinery and equipment is to be carried out to verify their compliance with **TL** rules and/or internationally accepted standards.

3.2.2 Upon approval of drawings and/or documents, a letter or design verification report is to be issued by **TL**.

3.3 Survey

Survey is to be performed on the basis of approved design documentation for the actual application and as required in the applicable **TL** rules. Compliance with the approved design documentation and applicable requirements is to be documented by certificates issued by **TL**.

3.4 Suspension and withdrawal of certificates

3.4.1 Product certificates, type approval certificates or approval of manufacturer certificate may be suspended or withdrawn if **TL** finds it justified.

3.4.2 Suspension or withdrawal of a certificate may take effect immediately or after a specified period of time.

3.4.3 When a certificate is suspended or withdrawn **TL** is to notify the client in writing and make the information publicly available.

In the case of suspension, a time limit is to be given for when the certificate will be withdrawn.

SECTION 3

SURVEYS

A. General Requirements

1. Definitions

1.1 Allowable corrosion limit is the acceptable corrosion limit for the ship's structure in the area in question.

1.2 Bay is the area between adjacent transverse frames from longitudinal bulkhead to longitudinal bulkhead (or side shell).

1.3 Bulk carrier is a ship intended primarily to carry dry cargo in bulk and constructed generally with single deck, double bottom, topside tanks and hopper tanks in cargo spaces.

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 (regardless of the width of the wing space)

1.4 A Chemical Tanker is 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 Chemicals In Bulk, IBC Code.

1.5 Gas tanker is a ship intended to carry liquefied natural or petroleum gases in bulk.

1.6 Combined cargo/ballast tank is a tank used for the carriage of cargo or ballast water as a routine part of the ship'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.

1.7 Integral tank form a part of the ship's hull and are influenced in the same manner and by the same loads which affect the adjacent hull structure.

1.8 Independent tank does not form part of the ship's hull. An independent tank is constructed and installed in such a way that the influence on the tank by the hull's deformation and stress is minimised. An independent tank does not contribute to the hull strength.

1.9 Machinery area comprises the engine rooms with propulsion and power generation machinery, all spaces containing boilers, other oil fired units and oil fuel units, all spaces containing steam and internal combustion engines, generators and major electric machinery, oil filling stations, refrigerated, stabilizing, ventilation and air conditioning machinery and trunks to the above spaces.

1.10 An Oil Tanker is a ship which is constructed primarily to carry oil in bulk and includes ship types such as combination carriers (Ore/Oil ships etc.).

A Double Hull Oil Tanker is a ship which is constructed primarily for the carriage of oil (MARPOL Annex I cargoes) 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.

1.11 Prompt and thorough repair is a permanent repair completed at the time of survey to the satisfaction of the surveyor, therein removing the need for the imposition of any associated condition of class.

1.12 Spaces are separate compartments within the hull and superstructures including holds, tanks, cofferdams, and void spaces bounding cargo holds, decks and the outer hull.

1.13 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.

1.14 Significant repair is a repair where machinery is completely dismantled and re-assembled. This repair is to be carried out after serious damage to machinery.

1.15 Ro-Ro ship is a ship which utilizes a loading ramp to enable wheeled vehicles to be rolled-on and rolled-off the ship.

1.16 Ro-Ro passenger ship - a passenger ship with Ro-Ro spaces or special category spaces.

1.17 Ro-Ro spaces - spaces not normally sub-divided in any way and normally extending to either a substantial length or the entire length of the ship, in which motor vehicles with fuel in their tanks for their own propulsion and / or goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or, other receptacles) can be loaded and unloaded normally in a horizontal direction.

1.18 Special category spaces - those enclosed vehicle spaces above or below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10m.

1.19 Securing device - a device used to keep the door closed by preventing it from rotating about its hinges.

1.20 Supporting device - a device used to transmit external or internal loads from the door to a securing device and from the securing device to the ship's structure, or a device other than a securing device, such as a hinge, stopper or other fixed device, that transmits loads from the door to the ship's structure.

1.21 Locking device - a device that locks a securing device in the closed position.

1.22 Additional requirements for General Dry Cargo ships defined in B 3.3, C3.2, and D 2.3 are to be applied for all self-propelled General Dry Cargo Ships of 500gt and above carrying solid cargoes other than;

- Ships subject to UR Z10.2 or UR Z10.5;
- Dedicated container carriers;
- Dedicated forest product carriers (not timber or log carriers);
- Ro-ro cargo ships;
- Refrigerated cargo ships;
- Dedicated wood chip carriers;
- Dedicated cement carriers;
- Livestock carriers;
- Deck cargo ships (carrying 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.

The requirements apply to surveys of hull structure and piping systems in way of cargo holds, 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.

Definitions in Section 2, C.2 are also applied.

2. Periodical Surveys

2.1 All ships are to be subjected to periodical surveys to confirm that the hull, machinery and equipment remain in satisfactory condition.

2.2 For retention of class, periodical and extraordinary surveys of hull, machinery and equipment must be performed.

Periodical surveys will belong to one of the following three categories:

- Annual survey,
- Intermediate survey,

- Class renewal survey,

The following specific surveys may be scheduled according to one or more of the above categories:

- Bottom survey,
- Propeller shaft survey,
- Boiler survey,
- Thermal oil heater survey,
- Pressure Vessel survey.

2.3 Periodical surveys are to be carried out at prescribed intervals and within applicable time windows. A survey may be splitted in different parts, commenced and progressed within the time window provided all the requirements of the survey are completed by the end of the time window.

2.4 The due date of a periodical survey is to be established depending upon the survey interval, measured from the date of class assignment or due date of the previous corresponding survey or date of completion of the previous corresponding survey, whichever is relevant.

A survey may be commenced prior to the defined time window at owner's request. In such a case the due date of subsequent surveys are to be adjusted accordingly.

2.5 The scope of survey may be extended when compliance with applicable rules can not be satisfactorily confirmed or the surveyor suspects that the ship is not maintained in accordance with the basis for retention of class.

2.6 Except for annual and intermediate surveys, **TL** may accept to postpone periodical surveys in exceptional circumstances and upon consideration in each case.

For ships equipped to take more than 12 passengers, any postponement beyond the due date is in principle impossible. An application for a brief deferment is to be made directly by the ship owner to Head Office.

Postponement conditions of surveys are laid down in relative survey schedules in 4.

2.7 The surveyors are to have access to classed ships at all reasonable times. The class certificate and other documents related to classification are to be made available to the surveyor upon request.

2.8 Surveys conducted during a voyage may be agreed and credited to periodical surveys due (e.g. inspection of large holds by boat). The prerequisites, procedures and specific (e.g. weather) conditions to be met will be fixed from case to case. The decision as to feasibility of the survey can only be taken in agreement with the Surveyor.

2.9 **TL** will inform the owner or operator about the status of class, indicating the last recognized surveys and the next due dates. However, even if not provided with such information, the operator is obliged to have the surveys stipulated by the present Rules performed.

2.10 **TL** reserve the right to extend the scope of survey and/or inspection for given reasons, e.g. in the light of special experience gained during operation.

2.11 **TL** reserve the right to demand surveys to be held between the due dates of regular surveys, if this is considered necessary.

2.12 If a ship has to be surveyed in a port beyond the reach of a **TL** Surveyor (also in the events of force majeure or of armed conflicts), **TL** Head Office will have to be notified. Upon checking of the facts, the further procedure will then be decided on.

On principle, in extraordinary cases and with **TL** Head Office agreement, it is possible to call for an external expert, whose report is, however, subject to examination by **TL**, who will decide on whether or not the ship will have to be re-surveyed.

2.13 **TL** may require a non-programmed survey about the condition of a ship and/or the equipment at any time to determine the actual condition.

3. Documentation

3.1 The records of each survey, as well as special requirements upon which the maintenance of class has been made conditional, will be entered in the relevant Survey Statement. By his signature in the certificate and other documents the surveyor only certifies what he saw by himself and checked at the moment the survey was held.

3.2 The reports prepared by the Surveyor will be checked at **TL** Head Office. If there are no objections, the results will be recorded.

3.3 In the Register the dates of the surveys will be indicated, such as Class renewals, annual survey, intermediate survey, continuous class renewal, bottom and propeller shaft survey. Records on periodical repeat tests on steam boilers and thermal oil heaters will be also entered in special Test Certificates, which are to be kept on board.

3.4 A confirmation of class affected by the Surveyor relates to the kind of survey referred to in the report and is valid under the reservation that examination will not give cause for any objections.

3.5 On request, the class may be confirmed in writing by a separate Certificate. However, such Certificates are valid only if issued by **TL** Head Office or if, in exceptional cases, Head Office has expressly authorized the field service representatives to do so.

3.6 Where defects are repaired provisionally only, or where the Surveyor does not consider immediate repairs or replacements necessary, the vessel's class may be confirmed for a limited period by making an entry in the survey statement to the Certificate of Classification. Cancellation of such limitations will also have to be indicated in the Survey Statement.

4. Survey Schedules

4.1 Annual surveys

Annual survey schedule is as follows:

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

4.1.2 In case a class annual survey is commenced prior to the defined time window, the survey must be completed not more than 6 months after the date of commencement.

4.1.3 An additional class annual survey may be required when the anniversary date has been advanced.

4.2 Intermediate surveys

Intermediate survey schedule is as follows:

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

4.2.2 The class intermediate survey is to be completed concurrently with the second or third class annual survey in each period of the class certificate.

4.3 Class renewal surveys

Class renewal survey schedule is as follows:

4.3.1 The due date is set at 5 years interval and corresponds to the expiry date of the class certificate.

4.3.2 The survey is normally being carried out within a time window of 3 months before the due date.

4.3.3 The survey may be commenced at the fourth annual survey or between the fourth and fifth annual surveys.

4.3.4 In case the survey is commenced more than 15 months before the expiry date of the class certificate, the due date of the survey will be advanced to a date not later than 15 months after the commencement.

4.3.5 The class renewal survey is to be completed concurrently with the last class annual survey in each period of the class certificate.

4.3.6 Postponement of the class renewal survey may be granted only upon the owner's request in exceptional circumstances and is not to exceed 3 months provided that the maximum interval between two successive bottom surveys is not to exceed 36 months in any case. For the postponement conditions of bottom survey, A.4.7.2 applies. The postponement of class renewal survey will not affect the survey's next due date. In this case, the next period of class will start from the expiry date of the Renewal Survey before the postponement was granted. Conditions in Section 2, C.3.2 applies.

4.4 Continuous class renewal surveys

Owner's hull inspection and maintenance schemes shall be encouraged as means for maintaining compliance with classification and statutory requirements between the surveys. However, these schemes are not to be accepted as an alternative to, or a substitute for, the performance of required classification and/or statutory surveys of the hull by the Surveyors of **TL** or of an IACS-member class society with which the ship is dually classed.

Note:
The Surveyors may be assisted, where appropriate, by service suppliers as defined in UR Z17.

For ships other than, General Dry Cargo Ships, Single and Double Hull Oil Tankers, Single and Double Skin Bulk Carriers, and Chemical Tankers;

4.4.1 At owner's application, the surveys required for class renewal may be split, according to a schedule to be agreed, such as to extend over the entire period of class so that abt. 20% of all surveys required for class renewal is to be completed every year. This means that all areas subject to survey as defined by **TL** Head Office are to be surveyed at least once per class period. The period between two subsequent surveys of each area must not exceed 5 years.

For ships more than 10 years of age, the ballast tanks are to be internally examined twice in each five-year class period, i.e. once within the scope of the intermediate survey and once within the scope of the continuous Class Renewal Survey (hull).

The survey in dry-dock for Continuous Class Renewal (hull) may be held at any time within the five-year Class period provided all the requirements of bottom surveys are also complied with.

4.4.2 Continuous class renewal may be applied for separately for the hull, the machinery, and the special equipment.

4.4.3 Regarding the duration of the period of class and due dates of surveys, the requirements as per 4.3 continue to be applicable.

4.4.4 At the end of a period of class, for the purpose of class renewal, a final survey at least in the scope of an Annual Survey will be performed, during which the Surveyor will satisfy himself as to whether all areas required to be surveyed have in fact been surveyed throughout, with satisfactory results. If there are special reasons, the Surveyor may inspect individual parts again.

4.4.5 Ships surveyed subject to the continuous class renewal system are not exempted from other periodical surveys (such as annual and intermediate surveys) prescribed.

4.4.6 The surveyor may extend the inspection at his discretion, to other items if the inspections carried out revealed any defects.

4.4.7 The agreement for surveys to be carried out on a Continuous Survey System basis may be withdrawn at discretion of the Society concerned.

4.5 Continuous class renewal surveys based on preventive maintenance systems

4.5.1 On owners' application, an optimized continuous class renewal system may be agreed on as outlined below for ships the machinery of which is maintained with the aid of an approved, computer-assisted maintenance system.

4.5.2 Owners will introduce a preventive maintenance system (Planned Maintenance System) comprising at least the survey scopes/systems as covered by the normal continuous class renewal system.

4.5.3 This maintenance system will have to be approved by **TL**, to this effect; owners will submit the following documentation, in English or Turkish:

- Detailed description of the system, indicating the information flows,
- List of components/systems to be covered by the optimized continuous class renewal system (Inventory Content),
- Indication of intervals for each of the maintenance measures in general,
- List of maintenance intervals and of the expected lifetime of the main and auxiliary machinery components essential for operation, taking into account manufacturers' recommendations and specific operational requirements,
- List of instructions (Maintenance Procedures) underlying the maintenance concept,
- Maintenance documentation (reports containing important operational information, component condition, offset sheets, measures carried out),
- Documentation on the maintenance strategy applied prior to filing of the application.

4.5.4 Within the scope of a shipboard survey the **TL** Surveyor will have to confirm that:

- The current maintenance system complies with the approved documentation,
- The current maintenance system takes into account, without reservation, the specific service conditions,
- The maintenance documentation permits conclusions to be drawn as to be construction condition and operability of the machinery,
- The personnel in charge of operation of the machinery are properly qualified and hold the necessary qualification certificates.

4.6 Surveys based on condition monitoring systems

Machinery or equipment, which is subject to a Condition Monitoring System, may be surveyed in line with the requirements and prerequisites described in “Machinery Condition Monitoring”. Prerequisite for this special Survey Arrangement CM is the existence of a computerized Planned Maintenance System (PMS). The elements of the PMS considering the machinery components or part of them covered by Condition Monitoring are to be approved by **TL**. For more details about “Planned Maintenance Scheme (PMS)” see also IACS UR Z20.

The Condition Monitoring System is not limited to the equipment used to determine the machinery’s condition, but also in addition consists of the applied procedures and schedules for data collection and analysis.

If the Condition Monitoring information are giving evidence to the Surveyor that the machinery, or part of it, is in an acceptable running condition, he may grant a waiver from dismantling of machinery, or part of it, for direct inspection.

Any item of the installation or machinery not covered by Condition Monitoring is to be surveyed and credited in the conventional way.

4.7 Bottom surveys

Bottom survey schedule is as follows:

4.7.1 The due date is set at intervals in accordance with the following:

- Two bottom surveys are required during each five year period of the class certificate.
- The intervals between any two successive bottom surveys are in no case to exceed 36 months.

4.7.2 Postponement of the bottom survey may be granted only with consent of flag state, in exceptional circumstances such as unavailability of dry-dock or repair facilities, unavailability of essential materials, equipment or spare parts or delays incurred by action taken to avoid severe weather conditions. The postponement is not to exceed 3 months. Conditions in Section 2, C.3.2 applies.

4.7.3 One bottom survey is to be carried out in conjunction with the class renewal survey.

4.7.4 One bottom survey is to be carried out in conjunction with the class intermediate survey in case of bulk carriers and tankers with class notation ESP when exceeding 10 years of age and general cargo ships subject to extended hull survey requirements when exceeding 15 years of age.

4.7.5 For passenger ships, the bottom survey is to be carried out annually.

4.7.6 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 craft may be greater than that given in 4.7.1.

Note:
Compliance with 4.7 does not absolve the Owner from compliance with the requirements of SOLAS as amended, especially when shorter intervals between examination of the ship's bottom for certain types of ship are required.

4.8 In-water surveys

The Owner is to notify the **TL** whenever the outside of the ship's bottom and related items can be examined in drydock or on a slipway.

4.8.1 For ships assigned the class notation **IWS**, an in-water survey performed with the assistance of an approved diving firm may be recognized as a substitute for every second periodical dry docking survey.

4.8.2 The In-water Survey is to provide the information normally obtained from a docking survey. Special consideration shall be given to ascertaining rudder bearing clearances and stern bush clearances of oil stern bearings based on a review of the operating history, on board testing and stern oil sample reports.

These considerations are to be included in the proposals for In-water Survey which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with **TL**.

4.8.3 On application an in-water survey in lieu of every second periodical dry docking survey may be carried out for ships without the class notation IWS with the assistance of an approved diving firm. The final permission will be given by **TL** Head Office.

4.8.4 In general, bottom survey for seagoing ships with accommodation for more than 12 passengers is to be carried out in dry-dock. The final permission for substitution with an In-water survey is subject to **TL** Head Office approval and is valid for one substitution only. More extensive Flag State Requirements regarding the substitution of the bottom survey in dry-dock shall be observed.

4.8.5 Special consideration should be given to vessels of 15 years of age or over prior to permission being granted to carry out an in-water survey in lieu of a dry docking survey. For ESP ships of 15 years of age and over, such examinations are to be carried out with the ship in drydock.

4.8.6 The equipment, procedure for observing and reporting the survey are to be discussed with the parties involved prior to the In-water Survey, and suitable time is to be allowed to permit the diving company to test all equipment beforehand.

4.9 Propeller shaft surveys

For retention of the class, periodical surveys and tests of propeller shafts and tube shafts, propellers, vane wheels and other systems of are to be carried out.

4.9.1 Propeller shafts and tube shafts

The following surveys are applicable:

- Normal survey,
- Modified survey,
- Partial survey.

4.9.1.1 Normal survey

Propeller shafts and tube shafts are to be sufficiently drawn to permit entire examination at the following intervals unless alternative means are provided to assure the condition of the shaft.

4.9.1.1.1 Where the propeller shafts and tube shafts are fitted with continuous liners or approved oil sealing glands, or are made of corrosion resistant materials, the interval of survey is to be:

At the most, in any of the following three cases:

- 3 years for single shafting arrangement,
- 4 years for multi-shafting arrangement.

The interval of drawing may be raised to:

- 5 years for single shafting arrangement,
- 5 years for multi-shafting arrangement.

1st case:

- The propeller is fitted to a keyed shaft taper,
- The design details of which are approved,
- The shaft is protected from seawater,
- A non-destructive examination is made at each survey by an approved crack-detection method of the after end of the cylindrical part of the shaft (from the after end of the liner, if any), and of about one third of the length of the taper from the large end, or

2nd case:

- The propeller is fitted to a solid flange coupling at the aft end of the shaft,
- The shaft and its fittings are not exposed to corrosion,
- The design details are approved
- Non-destructive examination of the fillet radius of the shaft flange may be required if the visual examination of the area is not satisfactory.

3rd case:

- The propeller is fitted keyless to the shaft taper,
- The shaft is protected from seawater,
- The design details are approved,
- A non-destructive examination is made at each survey by an approved crack detection method of the forward part of the aft shaft taper.

In all other cases the nominal interval of survey is to be 2.5 years with an admissible time window of ± 6 months.

4.9.1.1.2 Propeller shafts and tube shafts are to be sufficiently drawn to permit entire examination. For oil lubricated arrangement, the shaft need not be drawn at the occasion of the normal survey, provided that all exposed areas of the after shaft area as described in 4.9.1.1.1 are examined by an approved crack-detection method without drawing of the shaft, where

- The clearances and wear down of the bearings,
- The records of lubricating oil analysis, oil consumption and bearing temperature,
- The visible shaft areas.

are examined and found satisfactory. The crack detection test of the aft flange filet area may be dispensed with the solid flange couplings fitted at the end of the shaft. Lubricating oil and bearing temperature controls are to be performed. Where any doubt exists regarding the findings of the above, the shaft is to be sufficiently drawn to permit an entire examination.

4.9.1.2 Modified survey

4.9.1.2.1 For single and multi-shafting arrangements a modified survey may be accepted instead of the normal survey at alternate 5 yearly survey intervals, at the most, subject to:

- The shaft is fitted with oil lubricated bearings and oil sealing glands,

- The shaft and its fittings are not exposed to corrosion,
- New oil seals may be fitted without removal of the propeller (except in the case of keyed propeller),
- The design details are approved.

and provided that the clearances of the aft bearing are found in order and the lube oil and the oil sealing arrangements have proved effective in any of the following three cases:

- Where the propeller is keyed on the shaft taper and suitable crack-prevention measures are taken, or
- Where the propeller is fitted to a solid flange coupling at the end of the shaft, or
- Where the propeller is fitted keyless to the shaft taper.

The maximum interval between two successive normal surveys are not to exceed 10 years.

4.9.1.2.2 The shaft is to be sufficiently drawn to permit examination of the aft bearing contact area of the shaft. Drawing of the shaft to expose the aft bearing contact area of the shaft may not be required 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 documentation on lubricating oil analysis is to be available on board and be checked. Each analysis should include the minimum parameters:

- Water content,
- Chloride content,
- Content of bearing metal particles,
- Oil aging (resistance to oxidation).

Oil samples should be taken under service conditions. The class notation CM-PS assumes the fulfilment of these requirements. Where any doubt exists regarding the findings of the above, the shaft is to be sufficiently drawn to permit an examination.

4.9.1.3 Partial survey

4.9.1.3.1 Upon request by the Owner for shafts where the modified survey is applicable and

- A prolonged service fatigue life of seals is expected due to the appropriate combination of materials and controlled pressures in way of seals,

consideration may be given to a prolongation of the 5-yearly interval between normal surveys, provided a partial survey is performed.

In no case must the interval between normal surveys exceed 1.5 times the due interval.

4.9.1.3.2 The partial survey consists of checking the oil sealing glands and the clearance of the bearings.

For keyed propellers, the propeller is to be dismantled to expose the forward part of the taper and a nondestructive examination by an approved crack detection method is to be performed.

4.9.2 Propellers

During normal or modified surveys of the propeller shafts and tube shafts, the propellers as well as the remote and local control gear of controllable pitch propellers are to be surveyed at the Surveyor's discretion, depending on the findings.

4.9.3 Other systems

Other systems for main propulsion purposes, such as rudder and steering propellers, pod propulsion systems, pump jet units, etc., are subject to the same survey intervals as propeller shafts and tube shafts.

4.10 Boiler survey

4.10.1 Steam boilers are to be subjected to the following examinations and tests at regular intervals.

The term "steam boilers" includes exhaust gas boilers warm water and hot water generators (except where they are heated by steam or liquids).

4.10.2 External inspection

Boilers are to be subjected at annual intervals to an external inspection in accordance with the **TL** inspection programme.

For the external inspection a time window of ∓3 months is admissible.

4.10.3 Internal inspection

Steam boilers are to be subjected to an internal survey twice in every 5-year class period. The first internal survey has to be carried out on the occasion of the 2nd but not later than the 3rd regular annual survey. The maximum interval between internal surveys should not exceed 3 years. For ships with one main boiler only, internal inspections are to be performed every 2.5 years until 10 years after commissioning and every year thereafter. Boiler installations with only one main boiler and one auxiliary boiler powerful enough to operate the propulsion plant in an emergency (take-home boiler), count as multi-boiler plants.

4.10.4 An extension of the internal examination of the boiler up to 3 months beyond to due date can be granted in exceptional circumstances. The extension may be granted by **TL** after the following is satisfactorily carried out:

- External examination of the boiler,
- Boiler safety valve relieving gear (easing gear) is to be examined and operationally tested,
- Boiler protective devices operationally tested,
- Review of the operation, maintenance, repair history and feed water analysis records since the last boiler survey.

4.10.5 Steam pipes

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

4.10.5.2 Steam pipes with service temperatures exceeding 500°C are to be examined for expansion at 5-yearly intervals, starting from class renewal II, at the latest.

4.11 Thermal oil heater survey

4.11.1 External inspection

Thermal oil plants are to be subjected to an external inspection once a year. Proof of continued usability of the thermal oil shall be furnished by a competent testing agency.

For the external inspection, a time window of ±3 months is admitted.

4.11.2 Internal inspection

An internal inspection, including a tightness test of the whole plant, is to be performed at intervals of 5 years, counting from commencement of initial operation, and possibly in connection with a class renewal survey.

4.12 Pressure vessel survey

4.12.1 Pressure vessels which are subject to survey by **TL** according to the Construction Rules, are to be examined internally and externally every 5 years, possibly in connection with a class renewal survey.

4.12.2 Pressure vessels having a product of pressure by cubic capacity of p×ℓ≤ 200 (p in bar, ℓ in litre) are to be surveyed on the occasion of checking of the pertinent piping system.

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

If one or more gas cylinders fail, a total of 50% of the gas cylinders provided are to be subjected to an internal inspection and hydrostatic test. If further gas cylinders fail at the extended test, all gas cylinders are to be subjected to foregoing tests. In any case, all gas cylinders having failed must be replaced by new ones.

Halone containers of existing fixed Halone fire-extinguishing systems are exempted from this requirement.

Irrespective thereof, on the occasion of recharging CO_2 cylinders, Halone containers and other gas cylinders are to be tested, if the last test dates back 10 years or more.

4.12.4 CO_2 cylinders and other gas bottles of permanent gas fire extinguishing systems are subject to level checks every 2 years. These checks may also be performed by the crew and are then to be recorded in the form of a report and an entry in the ship's log. If the loss of CO_2 exceeds 10% or other gases 5%, refilling is to be undertaken. Refill of HALON receivers is not accepted, receivers should be replaced by other fire extinguishing means should the level drop by 5%.

4.12.5 Low pressure CO_2 bulk storage containers are subject to internal survey if the content has been released and the container is more than 5 years old but not more frequently than once within five years.

4.12.6 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.

4.12.7 Receivers in hydraulic or pneumatic control systems are to be examined during maintenance and repairs at the system; air receivers with a product of pressure by cubic capacity pxℓ ≥ 1000 (p=bar, ℓ=litre), are to be subjected to an internal inspection at least once during each class period and/or at intervals not exceeding 5 years.

4.12.8 The intervals between surveys as referred to may be reduced, depending on the findings.

4.13 Extraordinary surveys

4.13.1 Damage and repair surveys

Damage and repair surveys fall due if checks of the ship's hull, machinery or electrical installations and/or some special equipment classed have revealed that they no longer comply with **TL**'s Construction Rules, or if damage may be assumed in consequence of an average or some other event.

4.13.2 Voyage repairs and maintenance

Where repairs to hull, machinery or equipment, which affect or may affect classification and which are to be carried out by a riding crew during a voyage they are to be planned in advance. A complete repair procedure including the extent of proposed repair and the need for Surveyor's attendance during the voyage is to be submitted to and agreed upon by **TL** reasonably in advance. Failure to notify **TL**, in advance of the repairs, may result in suspension of the vessel's class.

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

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

IACS UR Z13 can be referred for "Guidelines for the Survey of Voyage Repairs".

4.13.3 Conversion surveys

In the case of conversions of a ship's hull or machinery surveys are to be conducted in accordance with the relevant approved particulars, as in the case of newbuildings.

4.13.4 Surveys of special equipment

Periodical surveys and checkings of special equipment covered by the class, such as diving installations, fire-fighting installations, incinerators or sea-water desalination systems, are to be carried out in accordance with the respective programmes fixed or to be fixed by **TL** for such special equipment characteristic of a particular type of ship.

4.13.5 Surveys of additional safety measures

For all ships the strength of the small hatches and their securing devices fitted on the exposed fore deck, are to comply with additional requirements **(1)** for these structures.

(1) *Additional requirements see UR S 26 of IACS.*

The strength requirements to resist sea forces of items, such as air and ventilator pipes and their closing appliances, and the securing of windlasses located within the forward quarter length are to comply with additional requirements **(2)** for fore deck fittings and equipment.

5. Condition for Survey and Access to Structures

5.1 To allow for a thorough examination, all surfaces are to be cleaned including removal of all loose scale from surfaces. In tanks where soft coating has been applied, representative areas and those areas where it is obvious that further close-up examination is required are to be cleaned free of soft coating.

5.2 For survey in dry-dock or on a slipway, the ship is to be placed on blocks of sufficient height and with necessary staging to allow the examination.

5.3 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.

5.4 All spaces are to be made safe for access, i.e. gas freed, ventilated and illuminated and prepared for the surveyor to examine the structure in a safe way. One or more of the following means for access are to be provided:

- Permanent staging with passages to structures,
- Temporary staging with passages to structures,
- Lifts and movable platforms,
- Hydraulic arm vehicles (cherry pickers),
- Boats or rafts,
- Portable ladders,
- Other equivalent means.

5.5 For close-up examination of the cargo hold frames of bulk carriers, the following additional requirements are to be met:

- For examination of lower parts of cargo hold frames and brackets, portable ladders may be accepted provided the ladder length is not to exceed 5 m.
- For examination of middle and upper parts of hold frames hydraulic arm vehicle is necessary.

6. Maintenance and Preparation for Survey

6.1 In every ship a maintenance system should be implemented. The maintenance system is to ensure that inspections and maintenance are carried out at defined intervals, any non-conformity is reported with its possible cause, appropriate corrective action is taken and records of these activities are maintained.

6.2 In preparation for survey and to allow for a thorough examination, machinery components and related spaces are to be cleaned, loose accumulated corrosion scale, mud and oil residues are to be removed.

6.3 When machinery components are renewed, such components are to be delivered in accordance with requirements of valid rules at the time of newbuilding.

7. Survey Extent

7.1 The survey consists of examination, measurement and tests for the purpose of ensuring the hull, equipment and machinery of the ship are in satisfactory condition with respect to corrosion, deformation, fractures, damages or other structural deterioration.

7.2 During examination or overall examination, the structure or equipment is visually examined. In such cases the general maintenance, coating condition, rust deposits, leakages and structural detachment and damages may be detected and the surveyor may extend the survey as considered necessary.

(2) *Additional requirements see UR S 27 of IACS.*

7.3 When close-up examination is required, the structure or equipment is visually examined from a distance normally within reach of hand.

7.4 The surveyor may require thickness measurements in any part of the structure where signs of wastage are evident or in areas where wastage is normally found.

The surveyor may extend the scope of the thickness measurements if considered necessary.

7.5 When thickness measurements are specified by the rules or required by the surveyor, the measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels.

Thickness measurements are carried out by a qualified company approved by **TL** and witnessed by the surveyor.

Where it is required to carry out thickness measurements of structures subject to close-up examination, these measurements are to be carried out simultaneously with the close-up examination.

7.6 Where substantial corrosion is found, additional thickness measurements are to be carried out to confirm the extent of substantial corrosion.

7.7 The examination may be extended also in cases when information is available of defects suffered on similar structure or details in similar tanks/holds or on similar ships and the structure under survey has been approved with reduced scantlings due to an approved corrosion control system.

8. Repair of Structural Damage

8.1 Any damage in association with wastage over the allowable limits which affects the ship's structural integrity or watertightness should be promptly and thoroughly repaired. In this scope side frames, their end attachment, shell plating, deck structure, bottom structure, inner bottom structure, watertight bulkheads, hatch covers and hatch coamings are to be considered.

9. Surveys in Accordance With Flag State Regulations

9.1 Where surveys are required on account of international conventions and of corresponding laws/ official ordinances of a flag state, **TL** will undertake them on application, or by official order, acting on behalf of the authorities concerned, based on the respective provisions; this includes surveys according to:

- The International Convention on Load Lines,
- The International Convention for the Safety of Life at Sea (SOLAS),
- The International Convention for the Prevention of Pollution from Ships (MARPOL),
- The IMO Codes, e.g. on Chemical and Gas Tankers,
- The related Conventions of the International Labour Office (ILO).

Where possible, such surveys will be carried out simultaneously with the class surveys.

9.2 **TL** will also undertake on request other surveys and checks stipulated by additional regulations and requirements of the flag state. Such surveys are subject to agreements made in each individual case and/or to the regulations of the country concerned.

9.3 All activities as outlined in 9.1 and 9.2 and, where applicable, issuance of relevant certificates are likewise subject to the general conditions of Section 1.

9.4 If for some reason a vessel's class has expired or has been withdrawn by **TL**, all statutory certificates issued by **TL** will automatically become void. If subsequently the class is renewed or reassigned, validity of these certificates will within the scope of its original period of validity be revived, provided that all surveys meanwhile having fallen due have been carried out.

10. External Service Suppliers

Firms providing services on behalf of the owner of a

ship or a mobile offshore unit, such as measurements, tests or maintenance of safety systems and equipment, and laboratories providing testing services, the results of which are used by Surveyors in making decisions affecting classification are subject to approval by the **TL**

Service Provider approval procedures shall applied the approval of the following categories of service suppliers:

Class services :

- Firms engaged in thickness measurements on ships except:
  - Non-ESP ships less than 500 gross tonnage and
  - All fishing vessels.
- Firms engaged in tightness testing of hatches with ultrasonic equipment.
- Firms carrying out in-water survey of ships and mobile offshore units
- Firms engaged in the examination of Ro-Ro ships bow, stern, side and inner doors.
- Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82) and IACS UI SC223.

Statutory services:

- Firms engaged in surveys and maintenance of fire extinguishing equipment and systems.
- Firms engaged in service on inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats.
- Firms engaged in the servicing and testing of radio communication equipment.
- Firms engaged in inspection and testing of centralised gas welding and cutting equipment.
- Firms engaged in surveys and maintenance of self contained breathing apparatus. .
- Firms engaged in annual performance testing of Voyage Data Recorders (VDR).
- Firms engaged in surveys of low location lighting systems using photo luminescent materials.
- Firms engaged in sound pressure level measurements of public address and general alarm systems.
- Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82) and IACS UI SC223 and/or MSC.288(87)

11. Calibration of measuring equipment

The inspection, measuring and test equipment used in workshops, shipyards and on board ships, which may form the basis for Surveyor's decisions affecting Classification or statutory work, shall be appropriate for the services to be performed. The firms shall individually identify and calibrate each unit of such equipment to a recognized national or international standard **(3)**.

B. Annual Surveys

1. General

1.1 Annual survey is a general survey of the hull, machinery and equipment to confirm that the ship complies with the applicable requirements and is satisfactorily maintained.

1.2 Unless a dry-dock survey is due, annual survey may be carried out with the ship afloat.

1.3 For passenger ships, the annual survey must include a bottom survey. If requested by the owner, the final permission for substitution with an in-water survey is subject to flag state and **TL** head office approval and this is to be valid for one substitution only.

2. Review of Documentation

2.1 Approved stability information booklet / or loading manual , where required is to be verified available onboard.

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(3) *See UR Z19 of IACS.*

This booklet / or loading manual , where required is to be the same as required when the ship was assigned class.

2.2 If a loading instrument is available on board its certificate is to be checked for validity.

It is to be documented that an annual check of the loading instrument by running one of the test conditions has been carried out. If not, the surveyor is to verify the running of the test condition onboard.

2.3 Instruction manuals for operation and maintenance are to be verified.

2.4 List of required signboards or notice plates are to be verified.

2.5 It is to be verified that records of inspection and maintenance for the implemented maintenance system for machinery are kept onboard.

2.6 For ships equipped for periodically unattended machinery space, a maintenance and testing program is to be verified kept onboard.

2.7 For ships complying with SOLAS IX/2, irrespective of the issuing authority of safety management system certificate, the surveyor will complete a list of evidence of possible safety management system failures recorded on the occasion of the annual survey.

3. Hull and Equipment

3.1 General (all ships)

3.1.1 The survey is to cover the following items:

- Examination of weather decks, ship side plating above water line visually. Cargo holds and engine rooms are to be surveyed at random, depending on the ship type and age. In case of suspected damages affecting the class, further investigations may be required.

- Checking of anchoring equipment for visible damages.

- Examination of hatch covers on exposed weatherdeck and cargo tank openings regarding the tightness and operability.

- Examination of opening and closing appliances of watertight doors in bulkheads, bow, side and stern doors, ventilators and air pipes, exposed machinery casings, windows and side scuttles.

- Examination of ventilators, including closing devices, if any.

- Examination of scuppers, discharges, side valves and freeing ports.

- Examination of fittings and supporting structures for stowage, securing and supporting of timber deck cargoes and containers, if applicable.

- Examination of piping on deck (pressure testing and thickness measurements of any piping system may be required if found necessary by the surveyor).

For tankers the survey is to include examination of cargo tank opening with pressure/vacuum valves, venting/gas freeing arrangements including masts and risers with flame screens/flame arrestors, provisions for drainage of cargo tank vent lines.

- Examination of ballast tanks when required as a consequence of the results of the class renewal and intermediate surveys 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 (see Table 3.1). These extended thickness measurements are to be carried out before the annual survey is credited as completed.

- Suspect Areas identified at previous surveys are to be examined. 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 (see Table 3.1). These extended thickness measurements are to be carried out before the annual survey is credited as completed.

- Examination of means of protection of crew, such as guard rails, bulwarks, gangways, etc.

- Examination of the weld connection between air pipes and deck plating.

- External examination of all air pipe heads installed on the exposed deck.

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

Hatch covers and coamings are to be surveyed as follows :

Checking that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

Where mechanically operated steel covers are fitted, checking the satisfactory condition of:

- Hatch covers;

- Tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gaskets lips, compression bars, drainage channels);

- Clamping devices, retaining bars, cleating;

- Chain or rope pulleys;

- Guides;

- Guide rails and track wheels;

- Stoppers, etc.;

- Wires, chains, gypsies, tensioning devices;

- Hydraulic system essential to closing and securing;

- Safety locks and retaining devices.

Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition of:

- Wooden covers and portable beams, carriers or sockets for the portable beams, and their securing devices;

- Steel pontoons;

- Tarpaulins;

- Cleats, battens and wedges;

- Hatch securing bars and their securing devices;

- Loading pads/bars and the side plate edge

- Guide plates and chocks;

- Compression bars, drainage channels and drain pipes (if any)

Checking the satisfactory condition of hatch coamings plating.

Random checking of the satisfactory operation of mechanically operated hatch covers:

- Stowage and securing in open condition;

- Proper fit, locking and efficiency of sealing in closed condition;

- Operational testing of hydraulic and power components, wires, chains, and link drives.

Table 3.1 Additional thickness measurements in way of substantial corrosion

Structural member	Extent of measurement	Pattern of measurement
Plating	Suspect area and adjacent plates	5 point pattern over 1 m^2
Stiffeners	Suspect area	3 measurements each in line across web and flange

3.2 Passenger ships -additional requirements-

In addition to the annual surveys prescribed for all seagoing ships and the surveys to be conducted during dry docking, every year, all closures on the weather deck, the watertight bulkheads, including all closures, all shell ports, fire doors and similar closures, the escapes and any cross-flooding arrangements are to be checked as to their general condition and operability.

3.3 General dry cargo ships -additional requirements-

3.3.1 Examination of the hull

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

3.3.1.2 Examination of watertight penetrations as far as practicable.

3.3.2 Examination of hatch covers and coamings

The survey is to cover the following items:

- Checking the satisfactory condition of hatch coaming plating and their stiffeners including close-up survey.

- Where mechanically operated steel hatch covers are fitted, close-up examination of hatch cover plating.

3.3.3 Examination of cargo holds

3.3.3.1 For ships 10-15 years of age, the following is to apply:

3.3.3.1.1 Overall survey of one forward and one after cargo hold and their associated tween deck spaces.

3.3.3.1.2 When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. Table 3.1 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.

3.3.3.2 For ships over 15 years of age, the following is to apply:

3.3.3.2.1 Overall survey of all cargo holds and tween deck spaces.

3.3.3.2.2 Close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approximately 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).

3.3.3.2.3 When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. Table 3.1 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.

3.3.3.2.4 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.

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

3.3.4 Additional requirements for single hold cargo ships after determining compliance with SOLAS II-1/23-3 and II-1/25

For ships complying with the requirements of SOLAS II-1/23-3 and II-1/25 for hold water level detectors, the annual survey is to include an examination and a test, at random, of the water ingress detection system and of their alarms.

3.4 Single skin bulk carriers -additional requirements-

The examination of hull surveys is to cover:

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

Examination of watertight penetrations as far as practicable.

Note:
For vessels built under the IACS Common Structural Rules, UR Z10.2 should be applied.

3.4.1 Examination of hatch covers and coamings

The survey is to cover the following items:

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, are to be surveyed open, closed and in operation to the full extent on 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 is to include the fastening of all peripheral, and cross joint cleats or other securing devices. Particular attention is to be paid to the condition of the hatch covers in the forward 25% of the ship's length, where sea loads are normally greatest.

If there are indications of difficulty in operating and securing hatch covers, additional sets above those required are to be tested in operation at the discretion of the surveyor.

Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the TL.

For each cargo hatch cover set, at each annual survey, the following items are to be surveyed:

- Cover panels, including side plates, and stiffener attachments that may be accessible in the open position by close-up survey (for corrosion, cracks, deformation);
- 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);
- Clamping devices, retaining bars, cleating (for wastage, adjustment, and condition of rubber components);
- Closed cover locating devices (for distortion and attachment);
- Chain or rope pulleys;
- Guides;
- Guide rails and track wheels;
- Stoppers;
- Wires, chains, tensioners, and gypsies;
- Hydraulic system, electrical safety devices and interlocks; and
- End and interpanel hinges, pins and stools where fitted.

At each hatchway, at each annual survey, the coamings, with panel stiffeners and brackets are to be checked for corrosion, cracks and deformation, especially of the coaming tops, including close-up survey.

Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components.

3.4.2 Examination of cargo holds

3.4.2.1 For single skin bulk carriers 10-15 years of age, the following is to apply:

- Overall survey of all cargo tanks

- Close-up survey of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approximately 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.

- Where the 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.

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

- When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that Substantial Corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.11. These thickness measurements are to be carried out before the annual survey is credited as completed. Suspect Areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

  For vessels built under the IACS Common Structural Rules, 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

3.4.2.2 For single skin bulk carriers over 15 years of age, the following is to apply (in addition to the requirements in 3.4.2.1):

- Close-up survey of one other selected cargo hold to the same extent as required for the forward cargo hold.

3.4.2.3 Additional annual survey requirements for the foremost cargo hold of ships subject to SOLAS XII/9.1

For single skin bulk carriers constructed with an insufficient number of transverse watertight bulkheads to satisfy the requirements for damage stability, the survey in the foremost cargo hold is to be extended as follows:

3.4.2.3.1 For bulk carriers of 5-15 years of age:

- An overall survey of the foremost cargo hold, including close-up survey of sufficient extent, minimum 25% of frames are to be carried out to establish the condition of shell frames including their upper and lower end attachments, adjacent shell plating, and transverse bulkheads, suspect areas identified at previous surveys.

- Where considered necessary by the surveyor as a result of the overall and close-up survey, the survey is too extended to include a close-up survey of all of the shell frames and adjacent shell plating of the cargo hold.

3.4.2.3.2 For bulk carriers exceeding 15 years of age:

- An overall survey of the foremost cargo hold, including close-up survey is to be carried out to establish the condition of all shell frames including their upper and lower and attachments, adjacent shell plating, and transverse bulkheads, suspect areas identified at previous surveys.

3.4.2.3.3 Thickness measurement is to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey.

The minimum requirement for thickness measurements are suspect areas identified at previous surveys. Where Substantial Corrosion is found, the extent of thickness measurements should be increased with the requirements of Table 3.11

The thickness measurement may be dispensed with provided the surveyor is satisfied by the close-up survey, that there is no structural diminution and the protective coating where fitted remains effective.

3.4.2.3.4 Where the protective coating in the foremost cargo hold, is found to be in good condition, the extent of close-up surveys and thickness measurements may be specially considered.

3.4.3 Examination of Ballast Tanks

Examination of ballast tanks when required as a consequence of the results of the class renewal and intermediate survey is to be carried out. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.11. 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 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.

3.4.4. Additional annual survey requirements after determining compliance with SOLAS XII/12 and XII/13

3.4.4.1 For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the annual survey is to include an examination and a test, at random, of the water ingress detection systems and of their alarms.

3.4.4.2 For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the annual survey is to include an examination and a test, of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

3.5 Double skin bulk carriers –additional requirements-

The examination of hull surveys is to cover:

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

Examination of watertight penetrations as far as practicable.

For examination of hatch covers and coamings, additional requirements defined in 3.4.1 are also applicable.

Note:
For vessels built under the IACS Common Structural Rules, UR Z10.5 should be applied.

3.5.1 Examination of cargo holds

3.5.1.1 For double skin bulk carriers 10-15 years of age, the following is to apply:

- Overall survey of two selected cargo holds.

- When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.14. These extended thickness measurements are to be carried out before the annual survey is credited as complete. Suspect Areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

  For vessels built under the IACS Common Structural Rules, 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.

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

3.5.1.2 For double skin bulk carriers over 15 years of age, the following is to apply:

- Overall survey of all cargo holds.

- When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.14. These extended thickness measurements are to be carried out before the annual survey is credited as complete. Suspect Areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

  For vessels built under the IACS Common Structural Rules, 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.

- All piping and penetrations in cargo holds, including overboard piping, are to be examined

3.5.2. Examination of Ballast Tanks

Examination of ballast tanks when required as a consequence of the results of the class renewal and intermediate survey is to be carried out. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.14. 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 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.

3.5.3 Additional annual survey requirements after determining compliance with SOLAS XII/12 and XII/13

3.5.3.1 For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the annual survey is to include an examination and a test, at random, of the water ingress detection systems and of their alarms.

3.5.3.2 For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the annual survey is to include an examination and a test, of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

3.6 Oil and chemical tankers -additional requirements-

Note:
For vessels built under the IACS Common Structural Rules, UR Z10.4 should be applied.

3.6.1 General

The examination of hull surveys is to cover:

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

Examination of watertight penetrations as far as practicable.

3.6.2 Examination of weather decks

3.6.2.1 Examination of cargo tank openings including gaskets, covers, coaming and flame screens.

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

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

3.6.2.4 Examination of cargo, crude oil washing, bunker and vent piping systems, including vent masts and headers.

3.6.3 Examination of cargo pump rooms and pipe tunnels if fitted

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

3.6.3.2 Examination of the condition of all piping systems.

3.6.4. Examination of Ballast Tanks

Examination of ballast tanks when required as a consequence of the results of the class renewal and intermediate survey is to be carried out. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.19 for oil tankers, Ore/Oil Ships, Table 3.20 for double hull oil tankers, Table 3.24 for chemical tankers. 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 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.

3.7 Liquefied gas tankers -additional requirements-

The annual survey is preferably to be carried out during a loading or discharging operation. Access for cargo tanks or inerted hold spaces, necessitating gas-freeing/aerating will normally not be necessary unless deemed necessary by the surveyor.

The examination of hull surveys is to cover the requirements provided in 3.6.1, 3.6.2 and 3.6.3.

3.7.1 Cargo handling systems

3.7.1.1 The cargo handling piping and cargo process piping is to be examined, with special attention to insulation on piping.

3.7.1.2 The sealing arrangements for tanks or tank domes penetrating decks or tank covers are to be examined.

3.7.1.3 Portable and/or fixed drip trays or insulation for deck protection in the event of cargo leakage is to be examined.

3.7.2 Closing devices, gastightness

3.7.2.1 The means for accomplishing gas tightness of the wheelhouse doors and windows is to be examined. All windows and sidescuttles 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.

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

3.7.3 Correct functioning of any arrangements for heating of structural hull steel is to be verified.

3.8 Survey Requirements for Shell and Inner Doors of Ro-Ro Ships

3.8.1 The survey is to consist of an examination to verify, as far as is practicable, that the bow, inner, side shell and stern doors are maintained in a satisfactory condition

3.8.2 Confirmation is to be obtained that no unapproved changes have been made to the bow inner, side shell and stern doors since the last survey.

3.8.3 Documents

If an Operating and Maintenance Manual (OMM) is required, it is to be verified that an approved copy is on board and any possible modifications are included. It is to be verified that documented operating procedures for closing and securing doors are kept on board and posted at an appropriate place. The surveyor shall examine the OMM with special attention to the register of inspections and its contents as a basis for the survey

3.8.4 Structural examination

Bow, inner, side shell and stern doors are to be examined with particular attention paid to:

- Structural arrangement of doors including plating, secondary stiffeners, primary structure, hinging arms and welding;
- Shell structure surrounding the opening of the doors and the securing, supporting and locking devices including shell plating, secondary stiffeners, primary structure, and welding;
- Hinges and bearings, thrust bearings;
- Hull and door side supports for securing, supporting and locking devices;
- Close-up survey of securing, supporting and locking devices including welding, for details refer to IACS UR Z 24.

Whenever a crack is found, an examination with NDT is to be carried out in the surrounding area and for similar items as considered necessary by the surveyor.

3.8.5 Measurement of clearances

Clearances of hinges, bearings and thrust bearings are to be taken, where no dismantling is required. Where the function test is not satisfactory, dismantling may be required to measure the clearances. If dismantling is carried out, a visual examination of hinge pins and bearings together with NDT of the hinge pin is to be carried out. Clearances of securing, supporting and locking devices are to be measured, where indicated in the OMM.

3.8.6 Sealing arrangement

An examination of packing material / rubber gaskets and retaining bars or channels, including welding is to be carried out.

3.8.7 Drainage arrangement

An examination of drainage arrangement, including bilge wells and drain pipes is to be carried out, where fitted. A test of the bilge system between the inner and outer doors is to be carried out

3.8.8 Function test of doors

Checking of the satisfactory operation of the bow, inner, side shell and stern doors during a complete opening and closing operation is to be made, as applicable, including:

- Proper working of the hinging arms and hinges;
- Proper engagement of the thrust bearings;
- Device for locking the door in the open position;
- Securing, supporting and locking devices;
- Proper sequence of the interlock system for the opening / closing system and the securing and locking devices;
- Mechanical lock of the securing devices;
- Proper locking of hydraulic securing devices in the event of a loss of the hydraulic fluid, according to the procedure provided by the OMM;
- Correct indication of open / closed position of doors and securing / locking devices at navigation bridge and other control stations;

- Isolation of the hydraulic securing / locking devices from other hydraulic systems;

- Confirmation that the operating panels are inaccessible to unauthorized persons;

- Verification that a notice plate giving instructions to the effect that all securing devices are to be closed and locked before leaving harbour is placed at each operating panel and supplemented by warning indicator lights;

- Examination of electrical equipment for opening, closing and securing the doors.

3.8.9 Function test of the indicator system

Checking of the satisfactory operation of the indicator system, where fitted, is to be carried out, as applicable, including:

- Proper visible indication and audible alarm on the navigation bridge panel, according to the selected function "harbour / sea voyage" and on the operating panel;

- Lamp test function on both panels;

- Verification that it is not possible to turn off the indicator light on both panels;

- Verification of fail safe performance, according to the procedure provided by the OMM;

- Confirmation that power supply for indicator system is supplied by the emergency source or other secure power supply and independent of the power supply for operating the doors;

- Proper condition of sensors and protection from water, ice formation and mechanical damage.

3.8.10 Test of water leakage detection system

Where fitted, the water leakage detection system is to be tested including proper audible alarm on the navigation bridge panel and on the engine control room panel, according to the procedure provided by the OMM.

3.8.11 Test of television surveillance system

Where fitted, the television surveillance system is to be tested including proper indication on the navigation bridge monitor and on the engine control room monitor

3.8.12 Tightness test

A hose test or equivalent is to be carried out. If the visual examination and function test have shown satisfactory results, the tightness test of shell doors on Ro-Ro cargo ships need not be carried out unless considered necessary by the attending surveyor.

3.8.13 NDT and Thickness Measurements

When considered necessary by the surveyor, NDT and thickness measurements may be required after visual examination and function test.

4. Machinery and Systems

4.1 General (all ships)

4.1.1 The survey is to cover the following items:

- Examination of spaces. Machinery area and spaces in the cargo area entered in connection with cargo handling is to be examined for general cleanliness and maintenance and with special attention to the fire and explosion hazards.

- Examination of boilers, pressure vessels with their appliances and safety devices.

- Checking of integrity/functioning of jacketed high pressure fuel injection piping, shielding

of flammable oil piping, insulation of hot surfaces exceeding 200ºC and oil burning equipment on boilers, hot water heaters, incinerators and inert gas generators.

- Inspection and checking of the main and auxiliary steering gear, including their appliances and control systems. In this scope, the survey is to include the following:

  - External examination of the steering gear and hydraulic piping,
  - Examination of oil filters,
  - Testing of power units and rudder actuators,
  - Testing of alarms,
  - Testing of local and remote steering control system,
  - Testing of emergency steering control,
  - Testing of alternative power supply, if required.

- Inspection of the remote control for quick closing/stopping devices of fuel valves, fuel pumps and ventilators.

- Checking of communication systems between bridge and machinery and steering gear spaces.

- Examination of bilge systems, bilge level alarms and remote control mechanisms.

- Random checking of the remote control and automation equipment.

- Checking of electrical installation. In this scope the survey is to include the following:

  - Examination of main power supply system with regard to general condition, fire hazard and safety,
  - Examination of emergency power supply system with regard to general condition, fire hazard and safety,
  - Examination of cable installation with regard to general condition, fire hazard and safety.

- Survey of explosion proof installations.

- Inspection/testing of fire extinguishing and fire alarm systems. The following is subject to inspection/testing:

  - Fire mains system, including hoses and nozzles,
  - Gas fire extinguishing system,
  - Dry powder fire extinguishing system,
  - Foam fire extinguishing system,
  - Sprinkler system, including water mist sprinkler
  - Systems,
  - Drencher system,
  - Any other fixed fire extinguishing system,
  - Portable fire extinguishers, mobile fire extinguishers, including portable foam applicator units,
  - Fire detection and alarm systems,
  - Emergency stop for ventilating fans, boiler forced draft fans, fuel transfer pumps, fuel oil purifiers, thermal oil pumps,
  - Fire closures (fire dampers, engine room skylights).

- Operational trial of the relevant equipment for ships assigned the class notation NAV, NAV-INS, NAV-O or NAV-OC.

- For class notation CM-PS the correct performance of oil sampling, evaluation of the temperature of the stern tube bearing and the evaluation of the oil consumption as well as the results of the required measurements have to be checked.

- Checking of further permanently installed installations to the surveyor's discretion, e.g. provision cooling plant, air conditioning plant, incinerating plant, etc.

4.2 Passenger ships additional requirements-

The arrangement for emergency and transitional source of power is to be tested.

4.3 Ships with single cargo hold -additional requirements-

For ships with single cargo hold, an examination and testing at random of the water ingress detection system and of their alarms is to be carried out.

4.4 Bulk carriers -additional requirements-

4.4.1 For bulk carriers, an examination and testing at random of the water ingress detection system and of their alarms is to be carried out.

4.4.2 For bulk carriers an examination and testing of the control and means for draining and ballast pumping forward of the collision bulkhead including bilges of dry spaces any part of which extends forward of the foremost cargo hold is to be carried out.

4.5 Oil and chemical tankers additional requirements-

4.5.1 Surveys for oil tankers

The survey is to cover the following items:

- Examination of deck foam system,

- Examination of cargo, bilge, ballast and stripping pumps,

- Examination and testing of gas detection system in cargo pump room.

- Examination of mechanical ventilation system for cargo handling spaces and other spaces within the cargo area normally entered.

- Examination of the pressure/vacuum monitoring arrangement for cargo tanks and vapour return system.

- Testing of remote operation and shut-down devices for cargo system.

- Examination of temperature sensors in bulkhead shaft glands bearings for pumps installed in cargo pump room.

- Testing of pressure gauges on cargo discharge line,

- Testing of temperature sensors for cargo, tank washing and ballast pumps,

- Testing of oily water interface detector,

- Testing of oil discharge monitoring system.

4.5.2 Surveys for chemical tankers

The survey is to cover the following items:

- Examination of deck foam system,

- Examination of cargo, bilge, ballast and stripping pumps,

- Examination and testing of gas detection system in cargo pump room.

- Examination of mechanical ventilation system for cargo handling spaces and other spaces within the cargo area normally entered.

- Examination of the pressure/vacuum monitoring arrangement for cargo tanks and vapour return system.

- Testing of remote operation and shut-down devices for cargo system.

- Examination of temperature sensors in bulkhead shaft glands bearings for pumps installed in cargo pump room.

- Examination and testing of cargo hoses,

- Examination and testing of cargo tank level gauging system,

- Testing of cargo tank overflow control system,

- Examination of vapour detection instruments,

- Testing of cargo temperature indication system,

- Testing of leakage alarm in spaces containing independent cargo tanks,

- Examination and testing of cargo heating/cooling system sampling arrangements,

- Examination of arrangement for storage of cargo samples,

- Examination of arrangements for storage of padding gas, monitoring of ullage spaces and provision of drying elements on air inlets to cargo tanks,

- Examination of decontamination showers and eye washes,

- Examination of pump discharge pressure gauges fitted outside the cargo pump room,

- Examination of cargo pump room taking care on remote operation of the bilge system, rescue arrangements and distinctive marking of pumps, valves and pipings in pump room,

4.6 Liquefied gas tankers - additional requirements -

4.6.1 Cargo handling systems

The survey is to cover the following items:

- 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.

- 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.

4.6.2 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

4.6.3 Instrumentation and safety systems

4.6.3.1 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

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

4.6.3.3 Emergency shut-down valves at shore connections and tanks are to be tested without flow in the pipe lines. It is to be verified that operation of the emergency shut-down system will cause the cargo pumps and compressors to stop.

4.6.3.4 The fixed and portable gas detection equipment, including indicators and alarms, is to be tested for correct functioning.

4.6.4 Environmental control for cargo containment systems

4.6.4.1 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.

4.6.4.2 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.

4.6.5 Miscellaneous

4.6.5.1 It is to be verified that all accessible cargo piping systems are electrically bonded to the hull.

4.6.5.2 Arrangements for burning methane boil-off are to be visually examined as far as practicable. The instrumentation and safety systems are to be verified as being in good working order in accordance with 4.6.3.1.

4.6.5.3 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.

4.6.5.4 Mechanical ventilation fans in gas dangerous spaces and zones are to be visually examined.

C. Intermediate Surveys

1. General

1.1 Intermediate survey is a survey of the hull, machinery and equipment to confirm that the ship complies with the applicable requirements and is satisfactorily maintained. Intermediate surveys are to be performed to the extent of annual surveys with the following additions.

1.2 Intermediate surveys are to be carried out for all seagoing ships.

2. Documentation on Board Ships

The following documentation is to be available on board ships. They are to be kept on board for the lifetime of the ship and be readily available for the surveyor.

2.1 Survey report file consisting of reports for structural surveys, executive hull summary, thickness measurement reports, survey programme.

2.2 Main structural plans of cargo and ballast holds or tanks (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), previous repair history, cargo and ballast history, extent of use of inert gas plant and tank cleaning procedures, records of inspections and actions by ship's personnel for structural deterioration, leakage in bulkheads and piping, condition of coating or corrosion prevention and any other information identifying critical structural areas and/or suspect areas requiring inspection.

3. Hull and Equipment

3.1 General (all ships)

3.1.1 The survey is to cover the following items:

- Examination of ballast tanks.

For ships between 5 and 10 years of age, an overall, internal examination of representative ballast tanks is to be carried out.

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

For ships over 10 years of age, an overall examination of all spaces used for water ballast is to be carried out.

If such examinations reveal no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains effective. For ballast tanks, excluding double bottom ballast tanks, if there is no hard protective coating, soft or semi-hard coating, or poor coating condition and it is not renewed,

the spaces in question are to be internally examined at annual intervals.

When such conditions are found in water ballast double bottom tanks, the spaces in question may be internally examined at annual intervals.

For those tanks subjected to survey stated above, special attention is to be given to cargo piping passing through ballast tanks, bilge and ballast piping passing through cargo and fuel oil tanks, air and sounding piping passing through cargo and ballast tanks and fuel pipes passing through ballast tanks.

- Examination of cargo holds

Depending on the ship's age and on the cargo carried, an internal examination of selected cargo holds is to be carried out in accordance with the surveyor's decision.

3.1.2 Areas where substantial corrosion is found during the survey, are to have thickness measurements extended (see, Table 3.1).

3.2 General dry cargo ships additional requirements

3.2.1 Ships 5-10 years of age

3.2.1.1 Ballast tanks

- For tanks used for water ballast, an overall survey of representative tanks selected by the surveyor is to be carried out. If such overall survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

- Where poor coating condition, soft or semi-hard coating, corrosion or other defects are found in water ballast tanks or where a hard protective coating was not applied from the time of construction, the examination is to be extended to other ballast tanks of the same type.

- 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 time of construction, the tanks in question are to be examined and thickness measurements carried out as considered necessary at annual intervals.

- When such breakdown of hard protective coating is found in water ballast double bottom tanks, where a soft or semi-hard coating has been applied, or where hard protective coating has not been applied, the tanks in question may be examined at annual intervals.

When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements are to be carried out.

3.2.1.2 Cargo holds

- An overall survey of one forward and one after cargo hold and their associated tween deck spaces is to be carried out.

- Areas found suspect at previous surveys are to be surveyed in accordance with the provisions of item B, 3.3.3.1.2.

3.2.2 Ships 10-15 years of age

3.2.2.1 Ballast tanks

- For tanks used for water ballast, an overall survey of all tanks is to be carried out. If such overall survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

- The requirements of last two paragraphs of 3.2.1.1 also apply.

3.2.2.2 Cargo holds

- An overall survey of all cargo holds and tween deck spaces.

- Areas found suspect at previous surveys are to be surveyed in accordance with the provisions of item B, 3.3.3.1.2.

- When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion.

3.2.3 Ships over 15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey as required in D.2.3, except for item 2c) in column 4 of Table 3.6.

  However, tank testing specified in D.2.3.7, survey of automatic air pipe heads and internal examination of fuel oil, lub oil and fresh water tanks are not required unless deemed necessary by the attending surveyor.

- In lieu of dry dock survey, an in water survey, according to the provisions of item 3.1.3 of UR Z3, may be considered as equivalent.

3.3 Single skin bulk carriers –additional requirements-

3.3.1 Bulk carriers 5-10 years of age

3.3.1.1 Ballast tanks

- For tanks used for water ballast, an overall survey of representative spaces selected by the surveyor is to be carried out. The selection is to include fore and aft peak tanks and a number of other tanks taking into account the total number and type of ballast tanks. If such overall survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

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

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

- In addition to the requirement above, suspect areas identified at previous surveys are to be overall and close-up surveyed.

3.3.1.2 Cargo holds

- An overall survey of all cargo holds, including close-up survey of sufficient extent, minimum 25% of frames are to be carried out to establish the condition of:

  - 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.

  - Areas found suspect at previous surveys.

- When considered necessary by the surveyor as a result of the overall and close-up survey, the survey is to be extended to include a close-up survey of all of the shell frames and adjacent shell plating of that cargo hold as well as a close-up survey of sufficient extent of all remaining cargo holds.

3.3.1.3 Extent of thickness measurements

- 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 3.3.1.2. The minimum requirement for thickness measurements are areas found to be suspect areas at previous survey.

- 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 hard protective coatings are found to be in a good condition.

- Where substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with Table 3.11. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

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

  - 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

  - Required to be measured at annual intervals.

- Where 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.

3.3.2 Bulk carriers 10-15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, internal examination of fuel tanks and pressure testing of all tanks are not required unless deemed necessary by the attending surveyor.

- In lieu of dry dock survey, an under water survey may be considered as equivalent.

3.3.3 Bulk carriers over 15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, internal examination of fuel tanks and pressure testing of all tanks are not required unless deemed necessary by the attending surveyor.

- In application of first para., a survey in dry-dock is to be part of the intermediate survey. The overall and close-up surveys and thicknes 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 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.

3.4 Double skin bulk carriers –additional requirements-

3.4.1 Bulk carriers 5-10 years of age

3.4.1.1 Ballast tanks

- For tanks used for water ballast, an overall survey of representative tanks selected by the surveyor is to be carried out. The selection is to include fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks. If such overall survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

- Where poor coating condition, corrosion or other

defects are found in water ballast tanks or where a hard protective coating was not applied from the time of construction, the examination is to be extended to other ballast tanks of the same type.

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

- In addition to the requirements above, suspect areas identified at previous surveys are to be overall and close-up surveyed.

3.4.1.2 Cargo holds

- An overall survey of all cargo holds is to be carried out.

- When considered necessary by the surveyor as a result of the overall survey, the survey is to be extended to include a close-up survey of those areas of structure in the cargo holds selected by the surveyor.

3.4.1.3 Extent of Thickness Measurements

- Thickness measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey, where required as per 3.4.1.2, and as provided in 3.4.1.1.

- 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.

- Where substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with the requirements of Table 3.14. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

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

  - 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

  - Required to be measured at annual intervals.

- Where 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.

3.4.2 Bulk carriers 10-15 years of age

3.4.2.1 The requirements of the intermediate survey are to the same extent as the previous class renewal survey. However, internal examination of fuel oil tanks and pressure testing of all tanks are not required unless deemed necessary by the attending surveyor.

3.4.2.2 In application of 3.4.2.1, 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 in lieu of the application of A 4.3.3 – A 4.3.4.

3.4.2.3 In application of 3.4.2.1, an under water survey may be considered in lieu of the requirement of D 2.5.

3.4.3 Bulk carriers over 15 years of age

3.4.3.1 The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, internal examination of fuel oil tanks and pressure testing of all tanks are not required unless deemed necessary by the attending surveyor.

3.4.3.2 In application of 3.4.3.1, 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 in lieu of the application of A 4.3.3 – A 4.3.4.

3.4.3.3 In application of 3.4.3.1, 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 holds and ballast tanks are to be carried out in accordance with the applicable requirements for Intermediate surveys, if not already performed.

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

3.5 Oil and chemical tankers -additional requirements-

3.5.1 Surveys for oil tankers

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.

3.5.1.1 Examination of weather deck

For weather decks, an examination as far as applicable of cargo, crude oil washing, bunker, ballast, steam and vent piping systems as well as 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.

3.5.1.2 Oil tankers 5-10 years of age

- For single hull oil tankers, all ballast tanks are to be surveyed. When considered necessary by the surveyor, thickness measurements and testing are to be carried out to ensure that the structural integrity remains effective.

- For double hull oil tankers, for tanks used for salt-water ballast, an overall survey of representative tanks selected by the surveyor is to be carried out. If such surveys reveal no visible structural defects, the examination may be limited to a verification that the hard protective coatings remain in good condition.

- A ballast tank is to be examined at subsequent annual intervals where:

  - A hard protective coating has not been applied from the time of construction, or
  - A soft or semi-hard coating has been applied, or
  - Substantial corrosion is found within the tank, or
  - The hard protective coating is found to be in less than good condition and the hard protective coating is not repaired to the satisfaction of the surveyor.

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

3.5.1.3 Oil tankers 10-15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder are not required unless deemed necessary by the attending surveyor.

- In lieu of dry-dock survey, an under water survey may be considered as equivalent.

3.5.1.4 Oil tankers over 15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, pressure testing of cargo and ballast tanks and the requirements for longitudinal strength evaluation of hull girder are not required unless deemed necessary by the attending surveyor.

- In application of first para., 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 wit 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.

3.5.2 Surveys for chemical tankers

3.5.2.1 Examination of weather deck

- 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.

3.5.2.2 Chemical tankers 5-10 years of age

- For ballast tanks, an overall survey of representative tanks selected by the surveyor is to be carried out. If such surveys reveal no visible structural defects, the examination may be limited to a verification that the hard protective coatings remain in good condition.

- A ballast tank is to be examined at subsequent annual intervals where:

A hard protective coating has not been,

- Applied from the time of construction, or
- A soft or semi-hard coating has been applied, or
- Substantial corrosion is found within the tank, or
- The hard protective coating is found to be in less than good condition and the hard protective coating is not repaired to the satisfaction of the surveyor.

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

3.5.2.3 Chemical tankers 10-15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, pressure testing of cargo and ballast tanks is not required unless deemed necessary by the attending surveyor.

- In lieu of dry dock survey, an under water survey may be considered as equivalent.

3.5.2.4 Chemical tankers over 15 years of age

- The requirements of the intermediate survey are to be to the same extent as the previous class renewal survey. However, pressure testing of cargo and ballast tanks is not required unless deemed necessary by the attending surveyor.

- In application of first para., 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.

3.6 Liquefied gas tankers -additional requirements-

The intermediate survey is preferably to be carried out with the ship in a gas-free condition. The extent of the testing required for the intermediate survey will normally be such that the survey cannot be carried out during a loading or discharging operation.

3.6.1 Ballast tanks

- 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 coating, soft or semi-hard coating or poor coating condition, the examination is to be extended to other ballast tanks of the same type.
- For ships over 10 years of age, an overall survey of all ballast tanks is to be carried out.
- If such examinations reveal no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.
- 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.
- When such conditions are found in double bottom ballast tanks, the tanks in question may be internally examined at annual intervals.
- The minimum requirements for close-up surveys at intermediate survey are given in Table 3.2.

4. Machinery and Systems

4.1 General (all ships)

4.1.1 The survey is to cover the following items:

- Performing of the following measurements:
  - Auxiliary diesel (s) crank web deflection, where relevant,
  - Main engine (s) crank web deflection,
  - Axial thrust bearing clearance of shafting system,
  - Axial thrust bearing clearance of main and auxiliary turbine rotors,
- Examination of electrical equipment in gas-dangerous spaces with respect to corrosion, flameproof enclosures, correct rating of lamps, earthing, function testing of pressurized equipment and of associated alarms, insulation resistance testing of power circuits.
- Operational testing of the following:
  - Emergency generating set, including emergency switchboard,
  - Emergency bilge valve,
  - Bilge, ventilation and monitoring systems for the carriage of dangerous goods,
  - Drainage appliances of starting air and control air receivers,
  - General operational test of the machinery for their unrestricted operability.

4.2 Oil and chemical tankers -additional requirements-

4.2.1 Surveys of oil tankers

- For ships over 15 years of age heating coils, tank cleaning apparatus and other equipment in cargo tanks, cofferdams and pipe tunnels within the cargo area are to be examined. Attachments of sacrificial anodes in tanks are to be examined.

Table 3.2 Minimum requirements for close-up survey at hull intermediate surveys of liquefied gas tankers

10 < age ≤ 15	Age > 15
Close-up survey of: - all web frames and both transverse bulkheads in a representative ballast tank **(1)** and **(2)** - the upper part of one web frame in another representative ballast tank - one transverse bulkhead in another representative ballast tank **(2)**	Close-up survey of: - all web frames and both transverse bulkheads in 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 adjacent longitudinal bulkhead structure.*

Note:

1. *Ballast tanks include topside, double hull side, double bottom, hopper side, or any combined arrangement of the aforementioned, and peak tanks where fitted.*

2. *For areas in tanks where protective coating is found to be in good condition, the extent of close-up survey may be specially considered by* ***TL****.*

3. *For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of close-up surveys may be specially considered by* ***TL****.*

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 suffered defects in similar tanks, or on similar ships according to available information,*
- *in tanks having structures approved with reduced scantlings.*

4.2.2 Surveys of chemical tankers

- Examination of systems for cargo heating and cooling.
- Ships over 10 years of age, examination of fittings in way of the representative cargo tanks.

For ships over 15 years of age heating coils, tank cleaning apparatus and other equipment in cargo tanks, cofferdams and pipe tunnels within the cargo area are to be examined. Attachments of sacrificial anodes in tanks are to be examined.

4.3 Liquefied gas tankers -additional requirements-

In addition to requirements listed in B 3.7 and B 4.6, the following additions are to be applied.

4.3.1 Instrumentation and safety systems

4.3.1.1 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.

4.3.1.2 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.

4.3.1.3 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.

4.3.2 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.

Note:

See also IACS Rec. No.35 - Inspection and maintenance of electrical equipment installed in hazardous areas.

4.3.3 Miscellaneous

The instrumentation and safety systems for burning cargo as fuel are to be examined in accordance with the requirements of 4.3.1.1.

D. Class Renewal Surveys

1. General

1.1 Class renewal survey is a major survey including visual examinations, measurements and testing of the hull and machinery, equipment and systems of sufficient extent to ensure that the ship complies with the relevant rule requirements and is in satisfactorily maintained condition.

1.2 The required examinations, measurements and tests are to be carried out before the class renewal survey is regarded as completed.

1.3 Possible deficiencies are to normally be rectified before the renewal survey is regarded as completed.

TL may accept that minor deficiencies, recorded as condition of class, are rectified within 3 months after the survey completion date.

1.4 Class renewal surveys are to be performed to the extent of annual surveys with the following additions.

2. Hull and Equipment

2.1 General (all ships)

2.1.1 The survey is to cover the following items:

- The examination of the hull is to be supplemented by thickness measurements and testing, as stated in the following, 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.

Thickness measurements are to be carried out in accordance with Table 3.3. The surveyor may extend the thickness measurements as deemed necessary. When thickness measurements indicate substantial corrosion, the extent of thickness measurements is to be increased to determine areas of substantial corrosion. Table 3.1 may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the survey is credited as completed.

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.

- Examination of underwater parts **(4)**.
- The anchors and chain cables are to be ranged, examined and the required complement and condition verified. The chain locker, holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker

(4) *See IACS UR Z3.*

tested. At class renewal survey No. 2 and subsequent class renewal surveys, chain cables are to gauged and renewed in cases where their mean diameter is worn below the limits allowed by **TL**.

- All spaces including holds and their tween decks where fitted, double bottom, deep, ballast, peak and cargo tanks, pump rooms, 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, lub oil and fresh water tanks is to be carried out in accordance with Table 3.4.

- Engine room structure is to be examined. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and engine room bulkheads in way of tank top and bilge wells. Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspect, thickness measurements are to be carried out, and renewals or repairs made when wastage exceeds allowable limits.

- 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.

- Boundaries of double bottom, deep, ballast, peak, and other tanks, including holds adapted for the carriage of salt water ballast, are to be tested with a head of liquid to the top of air pipes or to near the top of hatches for ballast/cargo holds. Boundaries of fuel oil, lub oil and fresh water tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil, lub 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. The surveyor may extend the testing as deemed necessary.

- Hatch covers and coamings are to be surveyed as follows:

  - A thorough inspection of the items listed in B, 3 for hatch covers and coamings, including close-up survey of hatch cover plating and hatch coaming plating, are to be carried out.

  - Checking of the satisfactory operation of all mechanically operated hatch covers is to be made, including stowage and securing in open position, proper fit and efficiency of sealing in closed conditions, operational testing of hydraulic and power components, wires, chains and link drives.

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

  - Checking the residual thickness of coamings, steel pontoon or hatch cover plating and stiffening members as deemed necessary by the Surveyor.

- For all ships except for passenger ships, automatic air pipe heads are to be completely examined (both externally and internally) as indicated in Table 3.5. 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.

Table 3.3 Minimum requirements for thickness measurements at class renewal survey

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.
	2) One transverse section of deck plating in way of a cargo space within the amidships 0.5 L.	2) Two transverse sections within the amidships 0.5 L in way of two different cargo spaces.	2) A minimum of three transverse sections in way of cargo spaces within the amidships 0.5 L.
		3) All cargo holds hatch covers and coamings (plating and stiffeners).	3) All cargo holds hatch covers and coamings (plating and stiffeners).
		4) Internals in forepeak and after peak tanks.	4) Internals in forepeak and after peak tanks.
			5) All exposed main deck plating full length.
			6) Representative exposed superstructure deck plating (poop, bridge and forecastle deck).
			7) Lowest strake and strakes in way of tween decks of all transverse bulkheads in cargo spaces together with internals in way.
			8) All wind-and-water strakes, port and starboard, full length.
			9) All keel plates full length. Also, additional bottom plates in way of cofferdams, machinery space and aft end of tanks.
			10) Plating of sea chests. Shell plating in way of overboard discharges as considered necessary by the attending surveyor.

Notes:

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

2. *Thickness measurements of internals may be specially considered by the surveyor if the hard protective coating is in good condition.*

3. *For ships less than 100 m. in length, the number of transverse sections required at class renewal survey no.3 may be reduced to one (1), and the number of transverse sections required at subsequent class renewal surveys may be reduced to two (2).*

4. *For ships more than 100 m. in length, at class renewal survey no. 3, thickness measurements of exposed deck plating within amidships 0.5 L may be required.*

Table 3.4 Minimum requirements for internal examination at hull class renewal surveys of fuel oil, lub oil and fresh water tanks

Tank	Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Fuel oil bunker tanks - Engine room - Cargo length area	 None None	 None One	 One Two	 One Half, minimum 2
Lub 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 class renewal survey, on a rotational basis.*

3 *Peak tanks (all uses) are subject to internal examination at each class renewal survey.*

4 *At class renewal survey No.3 and subsequent surveys, one deep tank for fuel oil in the cargo length area is to be included, if fitted.*

Table 3.5 Survey requirements for automatic pipe heads at class renewal surveys

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 and subsequent 10 < Age
- 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. - Two air pipe heads, one port and one starboard, on exposed decks, serving spaces aft of 0.25 L, preferably air pipes serving ballast tanks. **(1) (2)**	- All air pipe heads located on the exposed decks in the forward 0.25 L. - 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)**	- All air pipe heads located on the exposed decks

(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.*

2.2 Passenger ships

2.2.1 For examination of structures in passenger ships generally arranged with superstructure extending over most of the ship length, having structures with discontinuities and sides penetrated by large openings, special attention to be given to the integrity of main structural members.

2.2.2 Air pipe heads are to be examined as deemed necessary by the surveyor.

2.3 General dry cargo ships -additional requirements-

2.3.1 Examination of the hull

All cargo holds, water 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 (see 2.3.6) and testing (see 2.3.7) to ensure that the structural integrity remains effective.

2.3.2 Examination of piping systems

All piping systems within the spaces stated in 2.3.1 are to be examined and operationally tested to working pressure to attending surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

For surveys of automatic air pipes see 2.1.1.

2.3.3 Hatch covers and coamings

Thickness measurements of the hatch cover and coaming plating and stiffeners is to be carried out as given in Table 3.6.

2.3.4 Dry dock survey

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

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, lub oil and fresh water tanks, is to be carried out at each class renewal survey.

For fuel oil, lub oil and fresh water tanks, see Table 3.4 above.

2.3.5.2 The minimum requirements for close-up surveys at class renewal survey are given in Table 3.7.

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 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 3.7 may be specially considered.

2.3.6 Extent of thickness measurements

2.3.6.1 The minimum requirements for thickness measurements at class renewal surveys are given in Table 3.6.

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 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 3.6 Minimum requirements for the thickness measurements at hull class renewal surveys of general dry cargo ships

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
1. Suspect areas.	1. Suspect areas. 2. One transverse section of deck plating in way of a cargo space within the amidships 0.5 L. 3. Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.7.	1. Suspect areas. 2. Two transverse sections within the amidships 0.5 L in way of two different cargo spaces. 3. Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.7. 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 0.5 L. 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. Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.7. 4. All wind and water strakes full length.

Notes:

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

2. *For ships less than 100 m. in length, the number of transverse sections required at class renewal survey No. 3 may be reduced to one and the number of transverse sections at class renewal survey No. 4 and subsequent surveys may be reduced to two.*

Table 3.7 Minimum requirements for close-up survey at hull class renewal surveys of general dry cargo ships

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
(A) Selected shell frames in one forward and one aft cargo hold and associated tween deck spaces. **(B)** One selected cargo hold transverse bulkhead. **(D)** All cargo holds 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 webs with associated plating and framing in two representatives water ballast tanks of each type (i.e. topside, hopper side, side tank or double bottom tank). **(D)** All cargo hold hatch covers and coamings (plating and stiffeners). **(E)** Selected areas of all deck plating and under deck 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 holds 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 under deck 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 Class Renewal Survey No.3.

(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 under deck structure inside line of hatch openings between cargo hold hatches.*
(F) *Inner bottom plating.*

***Note**: Close-up survey of cargo hold transverse bulkheads to be carried out at the following levels:*

- *Immediately above the inner bottom and immediately above the tween decks, as applicable.*
- *Mid-height of the bulkheads for holds without tween decks.*
- *Immediately below the main deck plating and tween deck plating.*

Table 3.1 may 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 3.6 may 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. For fuel oil tanks, the representative tanks are to be pressure tested.

2.3.7.2 The surveyor may extend the tank 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 base 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 Additional requirements for single hold cargo ships after determining compliance with SOLAS II-1/23-3 and II-1/25

For ships complying with the requirements of SOLAS II-1/23-3 and II-1/25 for hold water level detectors, the class renewal survey is to include an examination and a test, at random, of the water ingress detection system and of their alarms.

2.4 Single skin bulk carriers –additional requirements-

All cargo holds, Ballast Tanks, including double bottom tanks, pipe tunnels,cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in 2.4.2 and 2.4.3, 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.

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

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

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

Note:

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

2.4.1 Extent of overall and close-up surveys

2.4.1.1 An overall survey of all tanks and spaces is to be carried out at each class renewal survey. Fuel oil tanks in the cargo length area are to be surveyed as stated in Table 3.8.

2.4.1.2 The minimum requirements for close-up surveys at class renewal survey are given in Table 3.9.

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

Table 3.8 Minimum requirements for surveys of fuel oil tanks in the cargo length area at hull class renewal surveys of single and double skin bulk carriers

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
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 are to be examined at each class renewal survey, on a rotational basis.*

3. *Peak tanks (all uses) are subject to internal examination at each class renewal survey.*

4. *At class renewal survey No. 3 and subsequent class renewal surveys, one deep tank for fuel oil in the cargo area is to be included, if fitted.*

2.4.1.4 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 3.9 may be specially considered.

2.4.2 Extent of thickness measurements

2.4.2.1 The minimum requirements for thickness measurement at class renewal survey are given in Table 3.10.

For additional thickness measurement applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2, see IACS URs S19 and S23.

For additional thickness measurement applicable to the side shell frames and brackets, see IACS UR S31.

2.4.2.2 Provisions for extended measurements for areas with substantial corrosion are given in Table 3.11. These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

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

- 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
- Required to be measured at annual intervals.

2.4.2.3 The surveyor may further extend the thickness measurements as deemed necessary.

2.4.2.4 For areas in tanks where hard protective coatings are found to be in a good condition, the extent of thickness measurement according to Table 3.10 may be specially considered.

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

2.4.2.6 Representative thickness measurement to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds and 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 extent of thickness measurements may be specially considered provided the surveyor is satisfied by the close-up survey, that there is no structural diminution, and the hard protective coating where applied remains efficient.

Table 3.9 Minimum requirement for close-up survey at hull class renewal surveys of single skin bulk carriers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
(A) 25% of shell frames in the forward cargo hold at representative positions. **(A)** Selected frames in remaining cargo holds. **(B)** One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type (i.e. topside, or hopper 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 plating. For bulk carriers 100.000 dwt and above, all shell frames in the forward cargo hold and 50% of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. **(B)** One transverse web with associated plating and longitudinals in each water ballast tank. **(B)** Forward and aft transverse bulkhead in one ballast tank, including stiffening system. **(C)** All cargo holds 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. **(B)** All transverse bulkheads in ballast tanks, including stiffening system. Areas **(C)**, **(D)** and **(E)** as for class renewal survey No.2.	**(A)** All shell frames in all cargo holds including upper and lower end attachments and adjacent shell plating. Areas **(B) - (E)** as for class renewal survey No. 3.

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

Note: *Close-up survey of transverse bulkheads to be carried out at four levels:*

Level (a) *Immediately above the inner bottom and immediately above the line of gusset (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 3.10 Minimum requirements for the thickness measurements at hull class renewal surveys of bulk carriers

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
	Within the cargo length: Two transverse sections of deck plating outside line of cargo hatch openings.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Two transverse sections, one in the amidship area, outside line of cargo hatch opening. - All wind and water strakes.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Three transverse sections, one in the amidship area, outside line of cargo hatch opening. - Each bottom plate.
	Wind and water strakes in way of the two transverse sections considered above. Selected wind and water strakes outside the cargo length area.	Selected wind and water strakes outside the cargo length area.	All wind and water strakes, full length.
	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.9.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.9.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.9.
		See IACS URs S19 and S23 for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with URs S19 and S23.	See IACS URs S19 and S23 for additional thickness measurement guidelines applicable to the vertically corrugated transverse watertight bulkhead between cargo hold Nos. 1 and 2 on ships subject to compliance with URs S19 and S23.
	See IACS UR S31 for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with UR S31.	See IACS UR S31 for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with UR S31.	See IACS UR S31 for additional thickness measurement guidelines applicable to the side shell frames and brackets on ships subject to compliance with UR S31

Table 3.11 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of bulk carriers within the cargo area

Sheet 1

SHELL STRUCTURES

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	a. 5 point pattern for each panel between longitudinals
2. Bottom/side shell longitudinals	Minimum of three longitudinals in way of suspect areas	3 measurements in line across web 3 measurements on flange

Table 3.11 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of bulk carriers within the cargo area

Sheet 2

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	a. 5 point between stiffeners over 1 meter length
	b. Transverse band within 25 mm. of welded connection to shelf plate	b. 5 point between stiffeners over 1 meter length
2. Transverse bulkhead	a. Transverse band at approximately mid height	a. 5 point pattern over 1 m^2 of plating
	b. Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with upper stools)	b. 5 point pattern over 1 m^2 of plating

Table 3.11 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of bulk carriers within the cargo area

Sheet 3

DECK STRUCTURE INCLUDING CROSS STRIPS, MAIN CARGO HATCHWAYS, HATCH COVERS, COAMINGS AND TOPSIDE TANKS

Structural member	Extent of measurement	Pattern of measurement
1. Cross deck strip plating	Suspect cross deck strip plating	5 point pattern between underdeck stiffeners over 1 meter length
2. Under deck stiffeners	a. Transverse members	a. 5 point pattern at each end and mid span
	b. Longitudinal member	b. 5 point pattern on both web and flange
3. Hatch covers	a. Side and end skirts, each 3 locations	a. 5 point pattern at each location
	b. 3 longitudinal bands outboard strakes (2) and centreline strake (1)	b. 5 point measurement each band
4. Hatch coamings	Each side and end coaming, one band lower 1/3, one band upper 2/3 of coaming	5 point measurement each band i.e. end or side coaming
5. Topside water ballast tanks	a. Watertight transverse bulkheads	
	i. lower 1/3 of bulkhead	i. 5 point pattern over 1 m^2 of plating
	ii. upper 2/3 of bulkhead	ii. 5 point pattern over 1 m^2 of plating
	iii. stiffeners	iii. 5 point pattern over 1 m length
	b. 2 representative swash transverse bulkheads	
	i. lower 1/3 of bulkhead	i. 5 point pattern over 1 m^2 of plating
	ii. upper 2/3 of bulkhead	ii. 5 point pattern over 1 m^2 of plating
	iii. stiffeners	iii. 5 point pattern over 1 m length
	c. 3 representative bays of slope plating	
	i. lower 1/3 of tank	i. 5 point pattern over 1 m^2 of plating
	ii. upper 2/3 of tank	ii. 5 point pattern over 1 m^2 of plating
	d. longitudinals, suspect and adjacent	d. 5 point pattern both web and flange over 1 m length
6. Main deck plating	Suspect plates and adjacent (4)	5 point pattern over 1 m^2 of plating
7. Main deck longitudinals	Minimum of 3 longitudinals where plating measured	5 point pattern on both web and flange over 1 m length
8. Web frames/transverses	Suspect plates	5 point pattern over 1 m^2

Table 3.11 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of bulk carriers within the cargo area

Sheet 4

DOUBLE BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurement
1. Inner/double bottom plating	Suspect plate plus all adjacent plates	5 point pattern for each panel between longitudinals over 1 meter length
2. Inner/double bottom longitudinals	Three longitudinals where plates measured	3 measurements in line across web and 3 measurements on flange
3. Longitudinal girders or transverse floors	a. Suspect plates	a. 5 point pattern over about 1 m^2
4. Watertight bulkheads (WT floors)	a. Lower 1/3 of tank	a. 5 point pattern over 1 m^2 of plating
	b. Upper 2/3 of tank	b. 5 point pattern alternate plates over 1 m^2 of plating
5. Web frames	Suspect plates	5 point pattern over 1 m^2 of plating
6. Bottom/side shell longitudinals	Minimum of three longitudinals in way of suspect area	3 measurements in line across web 3 measurements on flange

Table 3.11 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of bulk carriers within the cargo area

Sheet 5

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: 5 point pattern of both web and flange b. 5 point pattern within 25 mm. of welded attachment to both shell and lower slope plate

2.4.3 Extent of tank testing

2.4.3.1 All boundaries of water ballast tanks, deep tanks and cargo holds used for water ballast within the cargo length area are to be pressure tested. For fuel oil tanks, only representative tanks are to be pressure tested.

2.4.3.2 The surveyor may extend the testing as deemed necessary.

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

2.4.3.4 Boundaries of ballast holds are to be tested with a head of liquid to near to the top of hatches.

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

2.4.3.6 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.

2.4.4 Additional class renewal survey requirements after determining compliance with SOLAS XII/12 and XII/13

2.4.4.1 For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the class renewal survey is to include an examination and a test of the water ingress detection systems and of their alarms.

2.4.4.2 For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the class renewal survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

2.5 Double skin bulk carriers -additional requirements-

All cargo holds, Ballast Tanks, including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as required in 2.5.2 and 2.5,3 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.

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.

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

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

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

2.5.1 Extent of overall and close-up surveys

2.5.1.1 An overall survey of all tanks and spaces is to be carried out at each class renewal survey. Fuel oil tanks in the cargo length area are to be surveyed as stated in Table 3.8.

2.5.1.2 The minimum requirements for close-up surveys at class renewal survey are given in Table 3.12/sheet 1 for double skin bulk carriers, excluding ore carriers and in Table 3.12/sheet 2 for ore carriers, respectively.

2.5.1.3 The Surveyor may extend the close- up

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

2.5.1.4 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 3.12 may be specially considered,

2.5.2 Extent of thickness measurements

2.5.2.1 The minimum requirements for thickness measurement at class renewal survey are given in Table 3.13.

2.5.2.2 Provisions for extended measurements for areas with substantial corrosion are given in Table 3.14.

These extended thickness measurements are to be carried out before the survey is credited as completed. Suspect areas identified at previous surveys are to be examined. Areas of substantial corrosion identified at previous surveys are to have thickness measurements taken.

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

- 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

- Required to be measured at annual intervals.

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

2.5.2.4 For areas in tanks where hard protective coatings are found to be in a good condition, the extent of thickness measurements according to Table 3.13 may be specially considered.

2.5.2.5 Transverse sections are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements, one of which is to be in the amidships area.

2.5.2.6 Representative thickness measurement to determine both general and local levels of corrosion in the transverse web frames in all 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 extent of thickness measurements may be specially considered provided the surveyor is satisfied by the close-up survey, that there is no structural diminution, and the hard protective coating where applied remains efficient.

2.5.3 Extent of tank testing

2.5.3.1 All boundaries of water ballast tanks, deep tanks and cargo holds used for water ballast within the cargo length area are to be pressure tested. For fuel oil tanks, only representative tanks are to be pressure tested.

2.5.3.2 The surveyor may extend the testing as deemed necessary.

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

2.5.3.4 Boundaries of ballast holds are to be tested with a head of liquid to near to the top of hatches.

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

2.5.3.6 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.

Table 3.12 Minimum requirement for close-up survey at hull class renewal surveys of double skin bulk carriers, excluding ore carriers - Sheet 1

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type. (This is to include the foremost topside and double side water ballast tanks on either side). **(A)**	One transverse web with associated plating and longitudinals as applicable in each water ballast tank. **(A)** Forward and aft transverse bulkhead, 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). **(A)** 25% of ordinary transverse web frames in the foremost double side tanks. **(B)**	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. **(A)** 25% of ordinary transverse web frames in all double side tanks. **(B)**	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. **(A)** All ordinary transverse web frames in all double side tanks. **(B)** Areas **(C) – (E)** as for age interval 10 to 15 years.
Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(C)**	One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted. **(C)**	All cargo holds transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(C)**	
All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	
	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. **(E)**	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. **(E)**	

(A), (B), (C), (D) *and* **(E)** *are areas to be subjected to close-up surveys and thickness measurements.*

(A) *Transverse web frame or watertight transverse bulkhead in topside, hopper side and double side ballast tanks. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.*

(B) *Ordinary transverse frame in double side tanks.*

(C) *Cargo hold transverse bulkhead plating, stiffeners and girders.*

(D) *Cargo hold hatch covers and coamings.*

(E) *Deck plating and underdeck structure 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 gusset (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 3.12 Minimum requirement for close-up survey at hull class renewal surveys of ore carriers - Sheet 2

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
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. **(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. **(A)**	All web frame rings complete including adjacent structural members in a 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 by **TL**. **(A)**	As for class renewal survey for age interval 10 to 15 years.
Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(C)**	One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted. **(C)**	All cargo holds transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(C)**	Areas **(C) – (E)** as for age intervals 10 to 15 years.
All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	All cargo holds hatch covers and coamings (plating and stiffeners). **(D)**	
	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. **(E)**	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches. **(E)**	

(A), (C), (D) *and* **(E)** *are areas to be subjected to close-up surveys and thickness measurements.*

(A) *Transverse web frame or watertight transverse bulkhead in ballast wing tanks and void spaces. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.*

(C) *Cargo hold transverse bulkhead plating, stiffeners and girders.*

(D) *Cargo hold hatch covers and coamings.*

(E) *Deck plating and underdeck structure 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 gusset (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 3.13 Minimum requirements for the thickness measurements at hull class renewal surveys of double skin bulk carriers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
	Within the cargo length: Two transverse sections of deck plating outside line of cargo hatch openings.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Two transverse sections, one in the amidship area, outside line of cargo hatch opening. - All wind and water strakes.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Three transverse sections, one in the amidship area, outside line of cargo hatch opening. - Each bottom plate.
	Wind and water strakes in way of the two transverse sections considered above. Selected wind and water strakes outside the cargo length area.	Selected wind and water strakes outside the cargo length area.	All wind and water strakes, full length.
	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12.

2.5.4 Additional class renewal survey requirements after determining compliance with SOLAS XII/12 and XII/13

2.5.4.1 For ships complying with the requirements of SOLAS XII/12 for hold, ballast and dry space water level detectors, the class renewal survey is to include an examination and a test of the water ingress detection systems and of their alarms.

2.5.4.2 For ships complying with the requirements of SOLAS XII/13 for the availability of pumping systems, the class renewal survey is to include an examination and a test of the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold, and of their controls.

Table 3.14 Requirements for extent of thickness measurement at those areas of substantial corrosion of double skin bulk carriers within the cargo length area

Sheet 1

BOTTOM, INNER BOTTOM and HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
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.
Bottom, inner bottom and hopper structure longitudinals	Minimum of three longitudinals in each bay where bottom plating measured.	Three measurements in line across the flange and three measurements on the vertical web.
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.
Bottom floors, including the watertight ones	Three floors in the bays where bottom plating measured, with measurements at both ends and middle.	Five point pattern over 2 m^2 area.
Hopper structure web frame ring	Three floors in the bays where bottom plating measured.	Five point pattern over 1 m^2 of plating Single measurements on flange.
Hopper structure transverse watertight bulkhead or swash bulkhead.	- lower 1/3 of bulkhead	Five point pattern over 1 m^2 of plating
	- upper 2/3 of bulkhead	Five point pattern over 2 m^2 of plating
	- stiffeners (minimum of three)	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.
Panel stiffening	Where applicable	Single measurements

Table 3.14 Requirements for extent of thickness measurement at those areas of substantial corrosion of double skin bulk carriers within the cargo length area

Sheet 2

DECK STRUCTURE INCLUDING CROSS STRIPS, MAIN CARGO HATCHWAYS, HATCH COVERS, COAMINGS AND TOPSIDE TANKS

Structural member	Extent of measurement	Pattern of measurements
Cross deck strip plating	Suspect cross deck strip plating	Five point pattern between underdeck stiffeners over 1 m. length.
Underdeck stiffeners	Transverse members Longitudinal members	Five point pattern at each end and mid span Five point pattern on both web and flange.
Hatch covers	Side and end skirts, each three locations Three longitudinal bands, outboard strakes (2) and centreline strake (1)	Five point pattern at each location Five point measurement each band.
Hatch coamings	Each side and end of coaming, one band lower 1/3, and one band upper 2/3 of coaming.	Five point measurement each band i.e. end or side coaming.
Topside ballast tanks .	a) watertight transverse bulkheads: - lower 1/3 of bulkhead - upper 2/3 of bulkhead - stiffeners	 Five point pattern over 1 m^2 of plating Five point pattern over 1 m^2 of plating Five point pattern over 1 m. length
	b) two representative swash transverse bulkheads: - lower 1/3 of bulkhead - upper 2/3 of bulkhead - stiffeners	 Five point pattern over 1 m^2 of plating Five point pattern over 1 m^2 of plating Five point pattern over 1 m. length
	c) three representative bays of slope plating - lower 1/3 of tank - upper 2/3 of tank	 Five point pattern over 1 m^2 of plating Five point pattern over 1 m^2 of plating
	d) longitudinals, suspect and adjacent	Five point pattern on both web and flange over 1 m. length.
Main deck plating	Suspect plates and adjacent (4)	Five point pattern over 1 m^2 of plating
Main deck longitudinals	Suspect plates	Five point pattern on both web and flange over 1 m. length.
Web frames/transverses	Suspect plates	Five point pattern over 1 m^2 of plating

Table 3.14 Requirements for extent of thickness measurement at those areas of substantial corrosion of double skin bulk carriers within the cargo length area

Sheet 3

STRUCTURE IN DOUBLE SIDE SPACES OF DOUBLE SKIN BULK CARRIERS INCLUDING WING VOID SPACES OF ORE CARRIERS

Structural member	Extent of measurement	Pattern of measurements
Side shell and inner plating:		
- Upper strake and strakes in way of horizontal girders	- Plating between each pair of transverse frames/longitudinals in a minimum of three bays (along the tank)	- Single measurement
- All other strakes	- Plating between every third pair of longitudinals in same three bays	- Single measurement
Side shell and inner side transverse frames/longitudinals on:		
- Upper strake	- Each transverse frame / longitudinal in same three bays	- Three measurements across web and one measurement on flange.
- All other strakes	- Every third transverse frame/longitudinal in same three bays	- Three measurements across web and one measurement on flange.
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
Vertical web and transverse bulkheads:		
- Strakes in way of horizontal girders	- Minimum of two webs and both transverse bulkheads	- Five point pattern over approx. 2 m^2 area
- Other strakes	- Minimum of two webs and both transverse bulkheads	- Two measurements between each pair of vertical stiffeners
Horizontal girders .	Plating on each girder in a minimum of three bays	Two measurements between each pair of longitudinal girder stiffeners
Panel stiffening	Where applicable	Single measurements

Table 3.14 Requirements for extent of thickness measurement at those areas of substantial corrosion of double skin bulk carriers within the cargo length area

Sheet 4

TRANSVERSE BULKHEADS IN CARGO HOLDS

Structural member	Extent of measurement	Pattern of measurements
Lower stool, if fitted	- Transverse band within 25 mm. of welded connection to inner bottom	- Five point pattern between stiffeners over 1 m. length
	- Transverse band within 25 mm. of welded connection to shelf plate	- Five point pattern between stiffeners over 1 m. length
Transverse bulkheads	- Transverse band at approximately mid height	- Five point pattern over 1 m^2 of plating
	- Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with upper stools)	- Five point pattern over 1 m^2 of plating

2.6 Oil and chemical tankers -additional requirements-

2.6.1 Surveys for oil tankers

2.6.1.1 Examination of hull and tanks

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 measurements to ensure that 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.

2.6.1.2 Examination of cargo and ballast piping

Cargo piping on deck, including crude oil washing piping, 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.

2.6.1.3 Dry dock survey

A survey in dry dock is to be a part of the class renewal 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 class renewal surveys, if not already performed.

Note:

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

2.6.1.4 Examination of tank protection

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:

- Hard protective coating has not been applied from the time of construction, or
- A soft or semi-hard coating has been applied,or

- Substantial corrosion is found within the tank, or

- The hard protective coating is found to be in less than good condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

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

2.6 .1.5 Extent of overall and close-up survey

- An overall survey of all tanks and spaces is to be carried out at each class renewal survey.

- The minimum requirements for close-up surveys at class renewal survey are given in Table 3.15 for oil tankers, ore/oil ships,etc. and Table 3.16 for double hull oil tankers.

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

  - In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.

  - In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

- For areas in tanks where hard protective coating are found to be in a good condition, the extent of close-up surveys according to Table 3.15 for oil tankers, ore/oil ships,etc. and Table 3.16 for double hull oil tankers may be specially considered.

2.6.1.6 Extent of thickness measurement

- The minimum requirements for thickness measurements at class renewal survey are given in Table 3.17 for oil tankers, ore/oil ships,etc. and Table 3.18 for double hull oil tankers.

- Provisions for extended measurements for areas with substantial corrosion are given in Table 3.19 for oil tankers, ore/oil ships,etc. and Table 3.20 for double hull oil tankers, and as may be additionally specified in the survey programme. 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.

- The surveyor may further extend the thickness measurements as deemed necessary.

- For areas in tanks where hard protective coating are found to be in a good condition, the extent of thickness measurements according to Table 3.17 for oil tankers, ore/oil ships,etc.and Table 3.18 for double hull oil tankers may be specially considered.

- 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 0.5L amidships.

- In case of oil tankers of 130 m. in length and upwards and more than 10 years of age, for the evaluation of the ship's longitudinal strength, the sampling method of thickness measurements is given 2.6.1.7.

2.6.1.7 Sampling method of thickness measurements for longitudinal strength evaluation and repair methods

2.6.1.7.1 Extent of longitudinal strength evaluation

Longitudinal strength should be evaluated within 0.4 L amidships for the extent of the hull girder length that contains tanks therein and within 0.5 L amidships for adjacent tanks which may extend beyond 0.4 L amidships, where tanks means ballast tanks and cargo tanks.

Table 3.15 Minimum requirements for close-up survey at hull class renewal surveys of oil tankers ore/oil ships and etc.

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
(A) One web frame ring in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast. **(B)** One deck transverse in a cargo oil tank. **(D)** One transverse bulkhead in a ballast tank **(D)** One transverse bulkhead in a cargo oil wing tank. **(D)** One transverse bulkhead in a cargo oil centre tank.	**A)** All web frame rings in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast. **(B)** One deck transverse in each of the remaining ballast tanks, if any. **(B)** One deck transverse in a cargo wing tank. **(B)** One deck transverse in two cargo centre tanks. **(C)** Both transverse bulkheads in a wing ballast tank, if any, or a cargo wing tank used primarily for water ballast. **(D)** One transverse bulkhead in each remaining ballast tank. **(D)** One transverse bulkhead in a cargo oil wing tank. **(D)** One transverse bulkhead in two cargo centre tanks.	**A)** All web frame rings in all ballast tanks **(A)** All web frame ring in a cargo wing tank. **(A)** A minimum of 30% of all web frame rings in each remaining cargo wing tank (see note). **(C)** All transverse bulkheads in all cargo and ballast tanks. **(E)** A minimum of 30% of deck and bottom transverses including adjacent structural members in each cargo centre tank. **(F)** As considered necessary by the surveyor.	As class renewal survey No. 3. Additional transverses included as deemed necessary by **TL**.

(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*
(E) *Deck and bottom transverse including adjacent structural members.*
(F) *Additional complete transverse web frame ring.*

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

Table 3.16 Minimum requirements for close-up survey at hull class renewal surveys of double hull oil tankers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
One web frame **(1)**, in a ballast tank (see note 1).	All web frames **(1)**, in a ballast tank, (see note 1). The knuckle area and the upper part (5 metres approximately) of one web frame in each remaining ballast tank **(6).**	All web frames **(1)**, in all ballast tanks .	As for class renewal survey for age from 10 to 15 years. Additional transverse areas as deemed necessary by TL.
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 ballast tank (see note 1)	One transverse bulkhead **(4)**, in each 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).		

(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 metres approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.*

(7) *Web frame in a cargo oil tank means deck transverse, longitudinal bulkhead vertical girder and cross ties, where fitted, including adjacent structural members.*

Note:

1. *Ballast tank: means double bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.*

2. *Where no centre cargo tanks are fitted (as in case of centre longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.*

Table 3.17 Minimum requirements for the thickness measurements at hull class renewal surveys of oil tankers, ore/oil ships, and etc.

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
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)	Within the cargo area: - Each deck plate - One transverse section	Within the cargo area: - Each deck plate - Two transverse sections **(1)** - All wind and water strakes.	Within the cargo area: - Each deck plate - Three transverse sections **(1)** - Each bottom plate.
	Selected wind and water strakes outside the cargo area.	Selected wind and water strakes outside the cargo area.	All wind and water strakes, full length.
Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.15.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.15.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.15.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.15.

(1) *At least one section is to include a ballast tank within 0.5 amidships.*

Table 3.18 Minimum requirements for the thickness measurements at hull class renewal surveys of double hull oil tankers

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
One section of deck plating for the full beam of the ship within the cargo area	Within the cargo area: - Each deck plate - One transverse section	Within the cargo area: - Each deck plate - Two transverse sections **(1)** - All wind and water strakes.	Within the cargo area: - Each deck plate - Three transverse sections **(1)** - Each bottom plate.
	Selected wind and water strakes outside the cargo area.	Selected wind and water strakes outside the cargo area.	All wind and water strakes, full length.
Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.16.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.16.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.16.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.16.

(1) *At least one section is to include a ballast tank within 0.5 amidships.*

Table 3.19 Requirements for extent of thickness measurement at those areas of substantial corrosion Class renewal survey of oil tankers, ore/oil ships, and etc.within the cargo length area

Sheet 1

BOTTOM STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
Bottom plating	Minimum of three bays across tank, including aft bay Measurements around and under all suction bell mouths.	Five point pattern for each panel between longitudinals and webs.
Bottom longitudinals	Minimum of three longitudinals in each bay where bottom plating measured.	Three measurements in line across the flange and three measurements on vertically web.
Bottom girders and brackets	At fore and aft transverse bulkhead, bracket toes and in centre of tanks.	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face plate. Five point pattern on girder/bhd. brackets.
Bottom transverse webs	Three webs in the bays where bottom plating measured, with measurements at both ends and middle.	Five point pattern over 2 m^2 area. Single measurements on face flat.
Panel stiffening	Where provided	Single measurements

Table 3.19 Requirements for extent of thickness measurement at those areas of substantial corrosion Class renewal survey of oil tankers, ore/oil ships, and etc.within the cargo length area

Sheet 2

DECK STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
Deck plating	Two bands across tank	Minimum of three measurements per plate per band
Deck longitudinals	Minimum of three longitudinals in each of two bays	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 in centre of tanks.	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face flat. Five point pattern on girder/bhd. brackets.
Deck transverse web	Minimum of two webs with measurements at middle and both ends of span.	Five point pattern over 2 m^2 area. Single measurements on face flat.
Panel stiffening	Where provided	Single measurements

Table 3.19 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of oil tankers, ore/oil ships, and etc.within the cargo length area
Sheet 3

SIDE SHELL AND LONGITUDINAL BULKHEADS

Structural member	Extent of measurement	Pattern of measurements
Deckhead and bottom strakes, and strakes in way of stringer platforms	Plating between each pair of longitudinals in a minimum of three bays	Single measurements
All other strakes	Plating between every 3 rd pair of longitudinals in same three bays	Single measurements
Longitudinals - deckhead and bottom strakes	Each longitudinal in same three bays	Three measurements across web and 1 measurement on flange
Longitudinals - all others	Every third longitudinal in same three bays	Three measurements across web and 1 measurement on flange
Longitudinals - bracket	Minimum of three at top, middle and bottom of tank in same three bays	Five point pattern over area of bracket
Web frames and cross ties	Three webs with minimum of three locations on each web, including in way of cross tie connections	Five point pattern over about 2 m^2 area, plus single measurements on web frame and cross tie face flats.

Table 3.19 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of oil tankers, ore/oil ships, and etc.within the cargo length area

Sheet 4

TRANSVERSE BULKHEADS AND SWASH BULKHEADS

Structural member	Extent of measurement	Pattern of measurements
Deckhead and bottom strakes, and strakes in way of stringer platforms	Plating between pair of stiffeners at three locations- approx. ¼, ½ and ¾ width of tank	Five point pattern between stiffeners over 1 m length
All other strakes	Plating between pair of stiffeners at middle location	Single measurements
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
Stiffeners	Minimum of three typical stiffeners	For web, five point pattern over span between bracket connections (Two measurements across web at each bracket connection, and one at centre of span). For flange, single measurements at bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	Five point pattern over areas of bracket
Deep webs and girders	Measurements at toe of bracket and at centre of span	For web, five point pattern over abt. 1 m^2. Three measurements across face flat.
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 3.20 Requirements for extent of thickness measurement at those areas of substantial corrosion Class renewal survey of double hull oil tankers within the cargo length area

Sheet 1

BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
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.
Bottom, inner bottom and hopper structure longitudinals	Minimum of three longitudinals in each bay where bottom plating measured.	Three measurements in line across the flange and three measurements on vertical web.
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.
Bottom floors, including the watertight ones	Three floors in the bays where bottom plating measured, with measurements at both ends and middle.	Five point pattern over 2 m^2 area.
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.
Hopper structure transverse watertight bulkhead or swash bulkhead	- lower 1/3 of bulkhead	Five point pattern over 1 m^2 of plating.
	- upper 2/3 of bulkhead	Five point pattern over 2 m^2 of plating.
	- stiffeners (minimum of three)	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.
Panel stiffening	Where applicable	Single measurements

2.6.1.7.2 Sampling method of thickness measurement

- Pursuant to the requirements of item 2.6.1.6, transverse sections should be chosen such that thickness measurements can be taken for as many different tanks in corrosive environment as possible, e.g. ballast tanks sharing a common plane boundary with cargo tanks fitted with heating coils, other ballast tanks, cargo tanks permitted to be filled with sea water and other cargo tanks. Ballast tanks sharing a common plane boundary with cargo tanks fitted with heating coils and cargo tanks ermitted to be filled with sea water should be selected where present.

- The minimum number of transverse sections to be sampled should be in accordance with Table 3.17 or 3.18, as applicable. The transverse sections should be located where the largest thickness reductions are suspected to occur or are revealed from deck and bottom plating measurements and should be clear of areas which have been locally renewed or reinforced.

Table 3.20 Requirements for extent of thickness measurement at those areas of substantial corrosion Class renewal survey of double hull oil tankers within the cargo length area

Sheet 2

DECK STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
Deck plating	Two transverse bands across tank	Minimum of three measurements per plate per band
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 (usually in cargo tanks only)	At fore and aft transverse bulkhead, bracket toes and in centre of tanks.	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across flange. Five point pattern on girder/bhd. brackets.
Deck transverse webs	Minimum of two webs with measurements at middle and both ends of span.	Five point pattern over 1 m^2 area. Single measurements on flange.
Vertical web and transverse bulkhead in wing ballast tank (two metres from deck)	Minimum of two webs, and both transverse bulkheads	Five point pattern over 1 m^2 area.
Panel stiffening	Where applicable.	Single measurements

- At least two points should be measured on each deck plate and/or bottom shell plate required to be measured within the cargo area in accordance with the requirements of Table 3.17 or 3.18, as applicable.

- Within 0.1D (where D is the ship's moulded depth) of the deck and bottom at each transverse section to be measured in accordance with the requirements of Table 3.17 or 3.18, as applicable, every longitudinal and girder should be measured on the web and face plate, and every plate should be measured at one point between longitudinals.

- For longitudinal members other than those specified above to be measured at each transverse section in accordance with the requirements of Table 3.17 or 3.18, as applicable, every longitudinal and girder should be measured on the web and face plate, and every plate should be measured at least in one point per strake.

- The thickness of each component should be determined by averaging all of the measurements taken in way of the transverse section on each component.

2.6.1.7.3 Additional measurements where the longitudinal strength is deficient

- Where one or more of the transverse sections are found to be deficient in respect of the longitudinal strength requirements, the number of transverse sections for thickness measurement should be increased such that each tank within the 0.5L amidships region has been sampled. Tank spaces that are partially within, but extend beyond, the 0.5L region, should be sampled.

- Additional thickness measurements should also be performed on one transverse section forward and one aft of each repaired area to the extent necessary to ensure that the areas bordering the repaired section also comply with the a.m. requirements.

Table 3.20 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of double hull oil tankers within the cargo length area

Sheet 3

STRUCTURE IN WING BALLAST TANKS

Structural member	Extent of measurement	Pattern of measurements
Side shell and longitudinal bulkhead plating:		- Single measurements
- Upper strake and strakes in way horizontal girders	- Plating between each pair of longitudinalsin a minimum of three bays (along the tank).	- Single measurements
- All other strakes	- Plating between every third pair of longitudinals in same three bays.	
Side shell and longitudinal bulkhead longitudinals on:		
- Upper strake and strakes in way horizontal girders	- Each longitudinal in same three bays	- Three measurements across web and one measurements on flange
- All other strakes	- Every third longitudinal in same three bays	- Three measurements across web and one measurements on flange
Longitudinals - brackets	Minimum of three at top, middle and bottom of tank in same three bays.	Five point pattern over area of bracket.
Vertical web and transverse bulkhead (excluding deckhead area)		
- Strakes in way horizontal girders	- Minimum of two webs and both transverse bulkheads	- Five point pattern over approx. 2 m^2 area.
- Other strakes	- Minimum of two webs and both transverse bulkheads	- Two measurements between each pair of vertical stiffeners
Horizontal girders	Plating on each girder in a minimum of three bays	Two measurements between each pair of longitudinal girder stiffeners
Panel stiffening	Where applicable.	Single measurements

2.6.1.8 Extent of tank testing

- The minimum requirements for tank testing at class renewal survey are given in Table 3.21.
- The surveyor may extend the tank testing as deemed necessary.
- Boundaries of ballast tanks are to be tested with a head of liquid to the top of air pipes.
- Boundaries of cargo tanks are to be tested to the highest point that liquid will rise under service conditions.

Table 3.20 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of double hull oil tankers within the cargo length area

Sheet 4

LONGITUDINAL BULKHEADS IN CARGO TANKS

Structural member	Extent of measurement	Pattern of measurements
Deckhead and bottom strakes, and strakes in way of the horizontal stringers of transverse bulkheads	Plating between each pair of longitudinals in a minimum of three bays	Single measurements
All other strakes	Plating between every third pair of longitudinals in same three bays	Single measurements
Longitudinals on deckhead and bottom strakes	Each longitudinal in the same three bays	Three measurements across web and one measurement on flange
All other longitudinals	Every third longitudinal in same three bays	Three measurements across web and one measurement on flange
Longitudinals - brackets	Minimum of three at top, middle and bottom of tank in same three bays	Five point pattern over area of bracket
Web frames and cross ties	Three webs with minimum of three locations on each web, including in way of cross tie connections	Five point pattern over abt. 2 m^2 area of webs plus single measurements on flanges of web frame and cross tie.
Lower end brackets (opposite side of web frame)	Minimum of three brackets	Five point pattern over abt. 2 m^2 area of brackets plus single measurements on bracket flanges

Table 3.20 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of double hull oil tankers within the cargo length area

Sheet 5

TRANSVERSE WATERTIGHT AND SWASH BULKHEADS IN CARGO TANKS

Structural member	Extent of measurement	Pattern of measurements
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 m length
Deckhead and bottom strakes, and strakes in way of horizontal stringers	Plating between pair of stiffeners at three locations: approx. ¼, ½ and 3/4 width of tank	Five point pattern between stiffeners over 1 m length
All other strakes	Plating between pair of stiffeners at middle location	Single measurements
Strakes in corrugated bulkheads	Plating of each change of scantling at centre of panel and at flange of fabricated connection	Five point pattern over abt. 1 m^2 of plating
Stiffeners	Minimum of three typical stiffeners	For web, five point pattern over span between bracket connections (two measurements across web at each bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	Five point pattern over area of bracket
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

Table 3.21 Minimum requirements to tank testing at class renewal survey of oil and chemical tankers

Class renewal survey No. 1 Age ≤ 5	Class renewal 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

- For double hull oil tankers the testing of double bottom tanks and other spaces nor 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.

2.6.2 Surveys for chemical tankers

2.6.2.1 Examination of hull and tanks

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 measurements to ensure that 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.

2.6.2.2 Examination of cargo and ballast piping

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.

2.6.2.3 Dry dock survey

A survey in dry dock is to be a part of the class renewal 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 class renewal surveys, if not already performed.

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

2.6.2.4 Examination of tank protection

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:

- Hard protective coating has not been applied from the time of construction, or
- A soft or semi-hard coating has been applied, or
- Substantial corrosion is found within the tank, or
- The hard protective coating is found to be in less than good condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

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

2.6.2.5 Extent of overall and close-up survey

- An overall survey of all tanks and spaces is to be carried out at each class renewal survey.
- The minimum requirements for close-up surveys at class renewal survey are given in Table 3.22. 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.

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

  - In particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information.

  - In tanks which have structures approved with reduced scantlings due to an approved corrosion control system.

- For areas in tanks where hard protective coating are found to be in a good condition, the extent of close-up surveys according to Table 3.22 may be specially considered.

2.6.2.6 Extent of thickness measurement

- The minimum requirements for thickness measurements at class renewal survey are given in Table 3.23. Thickness measurement of stainless steel hull structure and piping may be waived, except for clad steel plating.

- Provisions for extended measurements for areas with substantial corrosion are given in Table 3.24 and as may be additionally specified in the survey programme. 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.

- The surveyor may further extend the thickness measurements as deemed necessary.

- For areas in tanks where hard protective coating are found to be in a good condition, the extent of thickness measurements according to Table 3.23 may be specially considered.

- Transverse sections are to be chose 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 0.5L amidships.

2.6.2.7 Extent of tank testing

- The minimum requirements for tank testing at class renewal survey are given in Table 3.21.

Pressure testing of cargo tanks may be accepted based on a confirmation from the master stating that the pressure testing has been carried out according to the requirements with a satisfactory result.

- The surveyor may extend the tank testing as deemed necessary.

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

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

- The testing of double bottom tanks and other spaces nor 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.

2.6.2.8 Chemical tankers over 10 years of age

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.

Table 3.22 Minimum requirements for close-up survey at hull class renewal surveys of chemical tankers

Sheet 1

Class renewal survey No.1 Age < 5	**Class renewal survey No.2 5 < Age < 10**	**Class renewal survey No.3 10 < Age < 15**	**Class renewal 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 1)	**(A)** All web frame rings in all ballast tanks	As class renewal survey No. 3.
(B) One deck transverse in a cargo oil tank.	**(B)** One deck transverse in each remaining ballast tank or on deck **(B)** One deck transverse in a cargo wing tank.	**(A)** All web frame rings in a cargo wing tank.	Additional transverses areas as deemed necessary
(D) One transverse bulkhead lower part in a ballast tank **(D)** One transverse bulkhead lower part in a cargo oil wing tank. **(D)** One transverse bulkhead lower part in a cargo centre tank. (see note 2)	**(B)** One deck transverse in a cargo centre tanks or on deck **(C)** Both transverse bulkheads in a ballast wing tank **(D)** One transverse bulkhead lower part in each remaining ballast tank **(D)** One transverse bulkhead lower part in two cargo centre tanks (see note 2) **(D)** One transverse bulkhead lower part in a cargo wing tank	**(A)** One web frame ring in each remaining cargo tank **(C)** All transverse bulkheads in all cargo tanks. **(C)** All transverse bulkheads in all ballast tanks	

A-D: *are areas to be subjected to close-up surveys and thickness measurements*

(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.*

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

2. *Where no centre cargo tanks are fitted (as in case of centre longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.*

Table 3.22 Minimum requirements for close-up survey at hull class renewal surveys of chemical tankers
Sheet 2

Class renewal survey No.1 Age < 5	Class renewal survey No.2 5 < Age < 10	Class renewal survey No.3 10 < Age < 15	Class renewal survey No.4 and subsequent Age > 15
(1) One web frame ring in a ballast double hull tank (see note 1) tank	**(1)** All web frame rings in a ballast wing tank or ballast double hull tank (see note 1)	**(1)** All web frame rings in all ballast tanks	As class renewal survey No. 3.
(2) One deck transverse in a cargo tank or on deck	**(6)** The knuckle area and the upper part (3 metres aapprox) of one web frame in each remaining ballast tank	**(7)** All web frame rings in a cargo wing tank.	Additional transverses areas as deemed necessary
(4) One transverse bulkhead in a ballast tank (see note 1)		**(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 2)	**(4)** One transverse bulkhead in a each ballast tank (see note 1) **(5)** One transverse bulkhead in two cargo centre tanks (see note 2) **(5)** One transverse bulkhead in a cargo win tank	**(4)** All transverse bulkheads in all ballast tanks	

(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 (3 metres approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.*

(7) *Web frame in a cargo tank means deck transverse, longitudinal bulkhead vertical girder and cross ties, where fitted, including adjacent structural members.*

Note:

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

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

Table 3.23 Minimum requirements for the thickness measurements at hull class renewal surveys of chemical tankers

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
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)	Within the cargo area: - Each deck plate - One transverse section	Within the cargo area: - Each deck plate - Two transverse sections **(1)** - All wind and water strakes.	Within the cargo area: - Each deck plate - Three transverse sections **(1)** - Each bottom plate.
	Selected wind and water strakes outside the cargo area.	Selected wind and water strakes outside the cargo area.	All wind and water strakes, full length.
Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22.

(1) *At least one section is to include a ballast tank within 0.5 L amidships.*

Table 3.24 Requirements for extent of thickness measurement at those areas of substantial corrosion Class renewal survey of chemical tankers within the cargo length area

Sheet 1

BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
Bottom, inner bottom and hopper structure plating	Minimum of three bays across tank, including aft bay Measurements around and under all suction bell mouths.	Five 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 measurements in line across the flange and three measurements on vertical web.
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. Two measurements across face flat where fitted.
Bottom floors, including the watertight ones	Three floors in the bays where bottom plating measured, with measurements at both ends and middle.	Five point pattern over 2 m^2 area.
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.
Hopper structure transverse watertight bulkhead or swash bulkhead	- lower 1/3 of bulkhead	Five point pattern over 1 m^2 of plating.
	- upper 2/3 of bulkhead	Five point pattern over 2 m^2 of plating.
	- stiffeners (minimum of three)	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.
Panel stiffening	Where applicable	Single measurements

Table 3.24 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of chemical tankers within the cargo length area

Sheet 2

DECK STRUCTURE

Structural member	Extent of measurement	Pattern of measurements
Deck plating	Two transverse bands across tank	Minimum of three measurements per plate per band
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 in centre of tanks.	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across flange. Five point pattern on girder/bhd. brackets.
Deck transverse webs	Minimum of two webs with measurements at middle and both ends of span.	Five point pattern over 1 m^2 area. Single measurements on flange.
Vertical web and transverse bulkhead in wing ballast tank for double hull design (two metres from deck)	Minimum of two webs, and both transverse bulkheads	Five point pattern over 1 m^2 area.
Panel stiffening	Where applicable.	Single measurements

Table 3.24 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of chemical tankers within the cargo length area

Sheet 3

SIDE SHELL AND LONGITUDINAL BULKHEADS

Structural member	Extent of measurement	Pattern of measurements
Side shell and longitudinal bulkhead plating: - Deckhead and bottom strakes, and strakes in way horizontal girders - All other strakes	- Plating between each pair of longitudinalsin a minimum of three bays (along the tank). - Plating between every third pair of longitudinals in same three bays.	Single measurements
Side shell and longitudinal bulkhead longitudinals on: - Deckhead and bottom strakes - All other strakes	- Each longitudinal in same three bays - Every third longitudinal in same three bays	Three measurements across web and one measurements on flange
Longitudinals - brackets	Minimum of three at top, middle and bottom of tank in same three bays.	Five point pattern over area of bracket.
Vertical web and transverse bulkheads of double side tanks (excluding deck area) - Strakes in way horizontal girders - Other strakes	- Minimum of two webs and both transverse bulkheads - Minimum of two webs and both transverse bulkheads	- Five point pattern over approx. 2 m^2 area. - Two measurements between each pair of vertical stiffeners
Web frames and cross ties for other tanks than double side tanks	Three webs with minimum of three locations on each web, including in way of cross tie connections and lower end brackets	Five point pattern over approx. 2 m^2 areas of webs, plus single measurements on flanges of web frame and cross tie.
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 3.24 Requirements for extent of thickness measurement at those areas of substantial corrosion
Class renewal survey of chemical tankers within the cargo length area

Sheet 4

TRANSVERSE WATERTIGHT AND SWASH BULKHEADS

Structural member	Extent of measurement	Pattern of measurements
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 m. length
Deckhead and bottom strakes, and strakes in way of horizontal stringers	Plating between pair of stiffeners at three locations: approx. ¼, ½ and 3/4 width of tank	Five point pattern between stiffeners over 1 m. length
All other strakes	Plating between pair of stiffeners at middle location	Single measurements
Strakes in corrugated bulkheads	Plating of each change of scantling at centre of panel and at flange of fabricated connection	Five point pattern over abt. 1 m^2 of plating
Stiffeners	Minimum of three typical stiffeners	For web, five point pattern over span between bracket connections (two measurements across web at each bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	Five point pattern over area of bracket
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
Deep webs and girders	Measurements at toe of bracket and at centre of span	For web, five point pattern over abt. 1 m^2. Three measurements across face flat.

2.7 Liquefied gas tankers -additional requirements-

2.7.1 General

In addition to requirements listed in B.3.7 and C.4.3 the following additions are to be applied.

Ballast tanks, including double bottom tanks, pump rooms, compress 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 measurements to ensure that 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.

All piping systems within the above spaces, except those covered by 3.3 (see also UR Z 16), are to be examined and operationally tested to working pressure to attending surveyor's satisfaction to ensure that tightness and condition remain satisfactory.

2.7.2 Cargo containment survey

2.7.2.1 All cargo tanks are to be examined internally.

2.7.2.2 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.

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.

2.7.2.3 Non-destructive testing:

2.7.2.3.1 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.

2.7.2.3.2 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.

2.7.2.4 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.

2.7.2.5 Where findings of 2.7.2.1 to 2.7.2.4 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 Chapter 10 - Liquefied Gas Tankers, 4.10.6 or 4.10.10 as appropriate. For independent tanks type C, the test pressure is not to be less than 1.25 times the MARVS (Maximum allowable relief valve setting).

2.7.2.6 At every other class renewal survey (i.e., 2nd, 4th, 6th, etc.), all independent cargo tanks type C are to be either:

2.7.2.6.1 Hydraulically or hydro-pneumatically tested to 1.25 times MARVS, followed by non-destructive testing in accordance with 2.7.2.3.1, or

2.7.2.6.2 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.

2.7.2.7 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.

2.7.2.8 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.

For membrane containment systems a tightness test of the secondary barrier shall be carried out in accordance with the system designers' procedures as approved by the **TL**.

For membrane containment systems with glued secondary barriers the values obtained shall be compared with previous results or results obtained at newbuilding stage. If significant differences are observed for each tank or between tanks, the Surveyor is to require an evaluation and additional testing as necessary.

2.7.3 Dry dock survey

A survey in dry dock is to be a part of the class renewal 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 class renewal surveys, if not already performed.

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

2.7.4 Examination of tank protection

2.7.4.1 Where provided, the condition of the 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 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.

2.7.4.2 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.

2.7.5 Extent of overall and close-up survey

- An overall survey of all tanks and spaces, excluding fuel oil, lub oil and fresh water tanks, is to be carried out at each class renewal survey.

- The minimum requirements for close-up surveys at class renewal survey are given in Table 3.25.

- The surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tasks 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.

- For areas in tanks where hard protective coatings are found to be a good condition, the extent of close-up surveys according to Table 3.25 may be specially considered.

2.7.6 Extent of thickness measurement

- The minimum requirements for thickness measurements at class renewal survey are given in Table 3.26.

- 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 3.1 may be used as guidance for these additional thickness measurements.

- For areas in tanks where hard protective coatings are found to be in a good condition, the extent of thickness measurement according to Table 3.26 may be specially considered.

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

Table 3.25 The minimum requirements for close-up survey at hull class renewal surveys of liquefied gas tankers

Class renewal survey No. 1 Age ≤ 5	Class renewal survey No. 2 5 < Age ≤ 10	Class renewal survey No. 3 and subsequent Age > 10
One web frame in a representative ballast tank of the topside, hopper side and double hull side type **(1)** One transverse bulkhead in a ballast tank **(3)**	All web frames in a ballast tank, which is to be a double hull side tank or a topside tank. If such tanks are not fitted, another ballast tank is to be selected **(1).** One web frame in each remaining ballast tank **(1).** One transverse bulkhead in each ballast tank **(2).**	All web frames in all ballast tanks **(1).** All transverse bulkheads in all ballast tanks **(2).**

(1) *Complete transverse web frame including adjacent structural members.*

(2) *Transverse bulkhead complete, including girder system and adjacent members, and adjacent 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 any combined arrangement of the aforementioned, and peak tanks where fitted.*

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 **TL**.*

3. *For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of close-up surveys may be specially considered by **TL**.*

4. *The surveyor may extend the close-up surveys as deemed necessary, taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases:*

- *in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar ships according to available information.*

- *in tanks having structures approved with reduced scantlings.*

Table 3.26 Minimum requirements for the thickness measurements at hull class renewal surveys of liquefied gas tankers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
One section of deck plating for the full beam of the ship within 0.5 L amidships in way of a ballast tank, if any.	Within the cargo area: - Each deck plate - One transverse section within 0.5 L amidships in way of a ballast tank, if any	Within the cargo area: - Each deck plate - Two transverse sections **(1)** - All wind and water strakes.	Within the cargo area: - Each deck plate - Three transverse sections **(1)** - Each bottom plate. - Duct keel plating and internals
	Selected wind and water strakes outside the cargo area.	Selected wind and water strakes outside the cargo area.	All wind and water strakes, full length.
Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.25.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.25.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.25.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.25.
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 that of a general cargo ship, the extent of thickness measurements may be increased to include the tank top plating at the discretion of the surveyor.*

2. *For areas in spaces where coatings are found to be in good condition, the extent of thickness measurements may be specially considered by TL.*

3. *The surveyor may extend the thickness measurements as deemed necessary. Where substantial corrosion is found, the extent of thickness measurements is to be increased to the satisfaction of the surveyor.*

2.7.7 Extent of tank testing

- All boundaries of water 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.
- The surveyor may extend the tank testing as deemed necessary.
- 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.

2.8 Survey Requirements for Shell and Inner Doors of Ro-Ro Ships

2.8.1 The Class Renewal Survey is to include, in addition to the requirements of the Annual Survey as required in B 3.8, examination, tests and checks of sufficient extent to verify that the bow, inner, side shell and stern doors, are in satisfactory condition and considered able to remain in compliance with applicable requirements, subject to proper maintenance and operation in accordance with the Operation and Maintenance Manual or manufacturer's recommendations and the periodical surveys being carried out at the due dates for the five year period until the next Class Renewal Survey .

2.8.2 The examinations of the doors are to be supplemented by thickness measurements and testing to verify compliance with applicable requirements so that the structural and weathertight integrity remain effective. The aim of the examination is to identify corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

2.8.3 The bow, inner, side shell and stern doors are to be surveyed as follows:

2.8.3.1 A survey of the items listed in 3.8.4, including close-up survey of securing, supporting and locking devices, together with welding, is to be carried out, for details refer to IACS UR Z 24.

2.8.3.2 Non-destructive testing and thickness measurements are to be carried out on securing, supporting and locking devices, including welding, to the extent considered necessary by the surveyor. Whenever a crack is found, an examination with NDT is to be carried out in the surrounding area and for similar items as considered necessary by the surveyor.

2.8.3.3 The maximum thickness diminution of hinging arms, securing, supporting and locking devices is to be treated according to the normal procedure of TL for primary structures, but is not to be more than 15% of the as-built thickness or the maximum corrosion allowance of TL, whichever is less. Certain designs may be subject to TL's special consideration.

2.8.3.4 Checking the effectiveness of sealing arrangements by hose testing or equivalent is to be carried out.

2.8.3.5 Clearances of hinges, bearings and thrust bearings are to be taken. Unless otherwise specified in the OMM or by manufacturer's recommendation, the measurement of clearances on Ro-Ro cargo ships may be limited to representative bearings where dismantling is needed in order to measure the clearances. If dismantling is carried out, a visual examination of hinge pins and bearings together with NDT of the hinge pin is to be carried out.

2.8.3.6 The non-return valves of the drainage system are to be dismantled and examined.

3. Machinery and Systems

3.1 General (all ships)

3.1.1 The survey is to cover the following items:

- The propulsion system is to be inspected for the proper functioning of the following:
  - Intermediate shafts and bearings, including thrust bearings,
  - Gearings,
  - Mechanical and flexible couplings,
  - Turning gear.

  Furthermore the propulsion system is to be tested for proper functioning of the following:
  - Alarm and safety system,
  - Manual and remote control of the machinery,
  - Transfer to stand-by manual control in the engine room in case of power supply failure to the remote control system.
- Components of main propulsion engines listed below are to be inspected and where deemed necessary by the surveyor checked in dismounted condition:
  - Cylinders, cylinder covers, pistons, piston rods and bolts, crossheads, crankshaft and all bearings,

- Camshaft with drive and bearings,
- Tie rod, frame, foundation and fastening elements,
- Injection system, attached pumps and compressors, superchargers, suction and exhaust lines, charge air coolers, filters, starting, reversing and manoeuvring equipment.

- The vibration behaviour of the main propulsion turbines is to be proved, possibly by regular checks during operation. Depending on the results obtained and as required by the surveyor, the turbine casing will have to be opened.

- The safety equipment of the turbines is to be tested**.**

- For all essential auxiliary engines, the survey scope is identical to that applying to main propulsion engines. A reduction in the scope of survey may be agreed upon examination of the maintenance protocol.

- The following machinery components are to be inspected and tested in the dismantled condition, where deemed necessary by the surveyor:
  - All pumps of the essential systems;
  - Air compressors, including safety equipment;
  - Separators, filters and valves;
  - Coolers, preheaters;
  - Main and auxiliary steering gear;
  - Anchor and other windlasses, including their drives;
  - Pipings, pipe connections, compensators and hoses;
  - Tank level indicators;
  - Installations preventing the ingress of water into open spaces
  - Fresh water distillation plant
  - Oil purifiers
  - Additional systems and components, where deemed necessary by the surveyor.

- The electrical equipment, including the generators, the motors of the essential auxiliary machinery, the switch gear, including its protective and interlocking device, cable network is to be examined externally. The insulation resistance is to be measured.

- Electrical installations, including machinery and equipment, located in spaces in which there is a risk of inflammable gas or steam air mixture accumulating, are to be checked as to the explosion protection provided.

- If the ship is propelled by electric machinery, the propulsion motors, the propulsion generators, exciters, particularly the windings of these machines and their ventilating systems are to be examined and tested. Checking of the electric switch gear for operability is to also cover the protective, safety and interlocking devices. The electric cables and their connections are to be inspected. The insulation resistance of all electric machinery and equipment is to be tested.

- Proof is to be furnished to the surveyor of the entire fire extinguishing equipment being ready for operation.

Emergency exits/escapes are to be inspected.

For CO_2 cylinders, see I.3.

On the occasion of every class renewal survey all CO_2 hose assemblies are to be subjected to a visual check.

All CO_2 hose assemblies made of synthetic rubber are to be replaced by type approved CO_2 hose assemblies not later than 10 years from the date of manufacture.

- The survey for control and monitoring system of main and auxiliary machinery is to include verification of correct functioning of the alarm system, safety system, and automatic control loops.

Ships equipped for periodically unattended machinery space and machinery centralised operated are to comply with the above requirements.

- Where pipes lead through tanks, they are to be examined and, if required by the surveyor, subjected to hydraulic tests. Depending on the results obtained, thickness measurements are to be carried out.

- Upon completion of class renewal surveys, the surveyor must be satisfied that the entire machinery installation, including the electrical machinery and equipment is operable without any restriction. In case of doubt, this may have to be proved by trials and operational tests.

- In ships assigned DK class notation, dynamic positioning systems including electrical control systems are to be subjected to operational tests.

- In ships with class notations FF1, FF2 or FF3, the fire fighting equipment are to be inspected and tested.

- In ships having class notation DG, the equipment for the carriage of dangerous goods (e.g. special fire fighting, alarm, ventilation and explosion protection equipment) is to be surveyed.

- For ships with inert gas plant (including ships with class notation INERT), the scrubber, deck water seal and non-return valves are to be opened up for examination.

  Pressure testing may be required if deemed necessary by the surveyor.

- In ships with FC (fuel cell) class notation, the survey is to include the following:

  - Examination of gastight bulkheads,
  - Testing of FC fuel tanks high level alarms
  - Examination and testing of FC fuel tanks safety relief valves, tank room or secondary barrier space p/v valves and relief hatches, as relevant, FC fuel handling machinery, portable gas detectors and oxygen analyser.

- For ships with gas turbine installations the survey is to include verification of records and major overhaul reports on board.

- For single hold cargo ships complying with the requirements of SOLAS II-1/23-3 and II-1/25 and for bulk carriers complying with the requirements of SOLAS XII/12 and XII/13, an examination and test of the water ingress detection system and of their alarms is to be carried out.

3.2 Oil and chemical tankers -additional requirements-

3.2.1 Heating coils, tank cleaning apparatus and other equipment in cargo tanks, cofferdams and pipe tunnels within the cargo area are to be examined. Heating coils are normally to be subjected to pressure test. Attachments of sacrificial anodes in tanks are to be examined.

3.2.2 For chemical tankers the survey is to include the following:

- Examination of systems for cargo heating and cooling.

- Testing of the instrumentation of the cargo plant

- Examination and testing of valves for drop lines, gas return lines and automatic shut-down of loading, drip trays and spray shields, emergency discharge pumps.

- Verification of the arrangement for discharge of contaminated water.

- Stripping tests of two cargo tanks.

3.3 Liquefied gas tankers -additional requirements-

In addition to requirements listed in B.3.7 and C.4.3, the following additions are to be applied.

3.3.1 Pressure and Vacuum Relief Valves

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.

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 class renewal survey.

3.3.2 Piping Systems

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.

The pressure relief valves are to be function-tested. A random selection of valves is to be opened for examination and adjusted.

3.3.3 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 periodical survey of machinery.

3.3.4 Miscellaneous

Systems for removal of water or cargo from interbarrier spaces and holds are to be examined and tested as deemed necessary.

All gas-tight bulkheads are to be inspected. The effectiveness of gas-tight shaft sealing is to be verified.

The following equipment is to be examined: hoses and spool pieces used for segregation of piping systems for cargo, inert gas and bilging.

It is to be verified that all cargo piping systems are electrically bonded to the hull.

E. Bottom Survey

1. Scope of the survey

1.1 When a ship is in drydock or on a slipway, it is to be placed on blocks of sufficient height and with the necessary staging to permit the examination of elements such as shell plating including bottom and bow plating, stern frame and rudder, sea chests and valves, propeller, etc.

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 the connection between the bilge strikes and the bilge keels. Important plate unfairness or other deterioration which do not necessitate immediate repairs are to be recorded.

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 not be opened up more than once in a special survey period unless considered necessary by the Surveyor.

1.4 Visible parts of rudder, rudder pintles, rudder shafts and couplings and stern frame are to be examined. If considered necessary by the Surveyor, the rudder is to be lifted or the inspection plates removed for the examination of pintles. The clearance in the rudder bearings is to be ascertained and recorded. Where applicable, pressure test of the rudder may be be required as deemed necessary by the surveyor.

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

1.6 Visible parts of side thrusters are to be examined.

Note:
For the survey of propeller shafts, refer to A.4.9.

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

2. General

2.1 Bottom surveys are surveys of the outside of the ship's hull below the load water line and related items.

2.2 The survey is to include the following examinations:

- Bottom and side plates of the shell plating,
- Rudder with attachments and bearings.

Visible parts of the following items are to be examined:

- Rudder,
- Rudder horn,
- Sole piece,
- Rudder stock with couplings,
- Rudder pintles and gudgeons.

For oil lubricated rudder bearings, the sealing arrangement is to be examined for tightness and the bearings are to be checked for wear as far as practicable.

For water lubricated rudder bearings the bearing clearances are to be measured.

For cone couplings, nuts are to be examined for verifying that all parts are intact and secure.

For flange couplings, bolts and nuts are to be examined for verifying that all parts are intact and secure.

- All sea valves, including scuppers and sanitary discharges are to be fully or partly opened and examined at alternate bottom survey.
- Steering fins, shaft brackets and other appendages are to be examined.
- Propellers with attachments and bearings.

The propeller blades, propeller boss and shaft external part is to be examined.

The propeller shaft external sealing arrangement and the propeller blade sealing arrangement are to be examined for tightness.

For water lubricated bearing, the propeller shaft bearing clearances are to be measured.

The following items are to be examined for tightness:

- Propeller nut
- Propeller hub coupling bolt and nuts, if bottom survey afloat, only the securing of the protective arrangement is to be examined.
- Propeller blade bolts:
  - Stabilizer fins.
  - All thrusters are to be examined externally. This examination covers survey of gear housing, propeller blades, bolt locking and other fastenings.

3. In Water Surveys

3.1 General

Every alternate bottom survey may in general be permitted while the ship is afloat for ships having class notation IWS.

3.2 Approvals

3.2.1 The diving firm assisting in in-water surveys must be approved by **TL** for this purpose.

3.2.2 Validity of an approval granted will depend on the continued qualification of satisfactorily carrying out the work required. The approval will have to be renewed after a period not exceeding 5 years.

3.3 Performance of survey

3.3.1 Unless accessible from outside with the aid of the vessel's trim and/or heel, underwater parts are to be surveyed and/or relevant maintenance work is to be carried out with assistance by a diver whose performance is controlled by a Surveyor, using an underwater camera with monitor, communication and recording systems.

3.3.2 The In-water Survey is to be carried out with the ship in sheltered water and preferably with weak tidal streams and currents. The in-water visibility and the cleanliness of the hull below the waterline is to be clear enough to permit a meaningful examination which allows the surveyor and diver to determine the condition of the plating, appendages and the welding. The **TL** is to be satisfied with the methods of orientation of the divers on the plating, which should make use where necessary of permanent markings on the plating at selected points.

3.3.3 The underwater pictures on the surface monitor screen must offer reliable technical information such as to enable the Surveyor to judge the parts and/or areas surveyed.

3.3.4 Documentation suited for reproduction (video tape with sound) is to be made available to **TL.**

3.4 Additional examinations

3.4.1 Where, for instance, grounding is assumed to have taken place, the Surveyor may demand individual parts of the underwater body to be additionally inspected from inside.

3.4.2 If during the in-water survey damages are found which can be assessed reliably only in dry-dock or require immediate repair, the vessel is to be dry-docked. If the coating of the underwater body is in a condition which may cause corrosion damages affecting vessel's class to occur before the next dry-docking the vessel is to be dry-docked.

F. Propeller Shaft Survey

The periodical surveys and tests of propeller shafts and tube shafts, propellers, vane wheels and other system defined in A.4.9 are to be performed as follows.

1. Propeller Shafts and Tube Shafts

1.1 Normal survey

The prerequisites are defined in A.4.9.1.1. It is distinguished between:

- Survey with drawing of the shaft
- Survey without drawing of the shaft

1.1.1 Survey with drawing of the shaft

The scope of normal survey consists in the following:

- Dismantling of propeller and key, where fitted, visual inspection of all parts of the shaft especially the cone, the keyway, the bearing contact areas of the shaft, the bearings, and the thread of the propeller nut, or the fillet of the flange, examination of the propeller fit,
- Non-destructive examination by an approved crack-detection method of the aft end of the cylindrical part of the shaft and of about one third of the length of the taper from the large

end and of the area of the keyway, or the fillet of the flange in case of a solid flange coupling. The crack detection test of the aft flange fillet area may be dispensed with for the solid flange couplings fitted at the end of the shaft, see also A.4.9.1.1.1.

- Examination of the bearing clearances and/or wear down before dismantling and after reassembling of the shaft with recording of the values measured,

- Overhaul of the shaft sealing glands according to manufacturer's instructions (sealing rings, liners, etc.).

1.1.2 Survey without drawing of the shaft

Where the prerequisites as defined in A.4.9.1.1.2 apply, for oil lubricating arrangement the scope of normal survey without drawing of the shaft consists in the following:

- Examination of all accessible parts of the shaft including the propeller connection to the shaft,

- Non-destructive examination by an approved crack-detection method of the aft end of the cylindrical part of the shaft and of about one third of the length of the taper from the large end and of the area of the keyway for keyed propellers, or of the forward part of the aft shaft taper for keyless propellers, or of the after fillet flange area of the shaft for solid flange coupling propellers.

  The crack detection test of the aft flange fillet area may be dispensed with for the solid flange couplings fitted at the end of the shaft, see also A.4.9.1.1.1.

  The area to be examined is to be sufficiently exposed, if necessary by shifting of the propeller shaft or backing-off of the propeller,

- Examination of the bearing clearances, respectively wear down of the aft bearing,

- Overhaul of the shaft sealing glands according to manufacturer's instructions (sealing rings, liners, etc.),

- Examination of the records of all regularly carried out lubricating oil analyses,

- Examination of the records of the oil consumption and the bearing temperatures.

Where doubts exist regarding the findings, the shaft is to be drawn to permit an entire examination.

1.2 Modified survey

The prerequisites are defined in A.4.9.1.2. It is distinguished between:

- Survey with exposing the aft bearing contact area of the shaft,

- Survey without exposing the aft bearing contact area of the shaft.

1.2.1 Survey with exposing the aft bearing contact area of the shaft

The scope of the modified survey consists in the following:

- Drawing the shaft to expose the aft bearing contact area of the shaft,

- Examination of the forward bearing as far as possible and of all accessible parts of the shaft including the propeller connection to the shaft,

- Examination and overhaul of the oil sealing glands according to manufacturer's instructions (sealing rings, liners, etc.),

- Examination of the bearing clearances and/or wear down of the shaft with recording of the values measured,

- Examination of the lubricating oil analysis and consumption to be within permissible limits,

- For keyed propellers, performing a non-destructive examination by an approved crack

detection method of about one third of the length of the taper from the large end, for which dismantling of the propeller is required, examination of the propeller fit.

- For keyless propellers performing a visual examination to confirm the good condition of the sealing arrangements.

Where doubts exist regarding the findings, the shaft is to be further dismantled, respectively drawn.

1.2.2 Survey without exposing the aft bearing contact area of the shaft

Where the prerequisites as defined in A.4.9.1.2.2 apply, the scope of the modified survey without exposing the aft bearing contact area of the shaft consists in the following:

- Examination and overhaul of the oil sealing glands according to manufacturer's instructions (sealing rings, liners, etc.),

- Examination of the bearing clearances and/or wear down of the shaft with recording of the values measured,

- For keyed propellers, performing a non-destructive examination by an approved crack detection method of about one third of the length of the taper from the large end, for which dismantling of the propeller is required, examination of the propeller fit.

In addition to this the survey shall include the following:

- Examination of the records of all regularly carried out lubricating oil analyses,

- Examination of the records of the oil consumption and the bearing temperatures.

Where doubts exist regarding the findings, the shaft is to be further dismantled, respectively drawn.

1.3 Partial survey

The prerequisites are defined in A.4.9.1.3. The partial survey consists in the following:

- Checking of the oil sealing for leakages,

- Examination of the bearing clearances and/or wear down of the shaft with recording of the values measured,

- Examination of the records of the lubricating oil analysis,

- Examination of the records of the oil consumption and the bearing temperatures.

Where the propeller is fitted to a keyed shaft taper, in addition:

- Dismantling of the propeller and examination of propeller fit

- Non-destructive examination by an approved crack-detection method of the aft end of the cylindrical part of the shaft and of about one third of the length of the taper from the large end and of the area of keyway are to be performed.

Where doubts exist regarding the findings, the shaft is to be further dismantled, respectively drawn.

2. Propellers

Propellers are to be examined visually on the occasion of each propeller shaft or tube shaft survey.

Damages, such as cracks, deformation, cavitation effects, etc. are to be reported and repaired at the Surveyor's discretion.

Controllable pitch propellers are to be checked for oil leakages. The function of the controllable pitch propellers has to be tested. The maintenance according to manufacturer's instructions has to be checked.

3. Other Systems

As far as practicable, the gearing and control elements of rudder and steering propellers are to be examined through inspection openings. For other systems such as pod propulsion systems, pump jet units, etc. the scope of survey is to be agreed with **TL** Head Office. The maintenance according to manufacturer's instructions is to be checked. A function test is to be carried out.

G. Boiler Survey

1. External Inspection

External survey of boilers including test of safety and protective devices and test of safety valve using its relieving gear is to be carried out annually.

The operability and general condition of the entire boiler, including its valves and fittings, pumps, pipings, insulations, foundation, control and regulation systems, and its protective and safety equipment, are to be examined. Also, the boiler records, operational documentation and qualification of the boiler operator are to be checked.

For exhaust gas heated boilers, the safety valves are to be tested by the Chief Engineer at sea within the boiler external survey window, see A.4.10.2. This test is to be recorded in the log book for review by the attending Surveyor prior to crediting the Annual Survey of Machinery.

2. Internal Inspection

Water tube boilers used for main propulsion, including reheat boilers, all other boilers of essential service, and boilers of non-essential service having working pressure exceeding 0.35 N/mm^2 (3.5 bar) and a heating surface exceeding 4.5 m^2, are to be surveyed internally.

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

At each survey the boilers, super heaters and economizers are to be examined internally on water-steam side and fire sides. Boiler mountings and safety valves are to be examined at each survey and opened out as considered necessary by **TL**.

The adjustment of the safety valves is to be verified during each boiler internal survey. For exhaust gas boilers, if steam cannot be raised at port, the safety valves are to be adjusted at the test bench. The correct set pressure is to be verified by the Chief Engineer at sea and the results recorded in the log book for review by **TL.**

Review of the following records since the last boiler survey is to be carried out as part of the survey:

- Operation,
- Maintenance,
- Repair history,
- Feed water chemistry.

Where the design of the boiler does not permit of 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.

Where there are doubts concerning the thickness of the boiler walls, it is to be ascertained by means of a recognized gauging method. On the basis of the result of such inspection the allowable working pressure at which the boiler may be operated in future is to be decided on.

The hydraulic pressure test is to be carried out to a test pressure of 1.5 times the maximum allowable working pressure.

If this is less than 2 bars, then the test pressure should be at least 1 bar more than the maximum allowable working pressure. In no case the test pressure may exceed the test pressure applied during the constructional check and hydrostatic pressure test of the boiler after completion.

In addition to above requirements, in exhaust gas heated economizers of the shell type, all accessible welded joints are to be subjected to a visual examination for cracking. It is left to the discretion of the Surveyor if non-destructive testing is required for this purpose additionally.

3. Extraordinary Inspection

Beyond the above mentioned periodical inspections extraordinary inspections including non-destructive tests and hydraulic pressure tests may be required at the Surveyor’s discretion, e.g. in case of damages, repairs and maintenance work.

4. Steam Pipes

4.1 Steam pipes with steam temperatures of up to 350°C and with outside diameters of more than DN 75, are to be examined at random. Random examina-tions of the internal condition of the pipelines, especially of pipe bends, or additional more detailed examinations may be required. Instead of the internal inspection, a hydraulic test may be affected to a pressure equal to 1.5 times the design pressure, but not exceeding that of the prescribed test pressure for the pertinent boiler plant.

4.2 In the case of steam pipes with steam temperatures exceeding 350°C (at least two) selected individual parts of pipes are to be dismounted from each piping system (main steam pipe and auxiliary steam pipes of each service group) having an outside diameter exceeding DN 32. Approximately 10% of the welding seams at bends, flanges or tee-branches are to be subjected to an inspection for cracks by recognized non-destructive test methods.

Before being used again, removed screws of flanged joints are to be inspected for their general condition and cracks and renewed, if necessary.

4.3 Steam pipes designed to resist steam temperatures exceeding 500°C and welded piping systems are to be examined as follows:

Flanged pipes in accordance with 4.2; however, the inspection for cracks has to cover at least 20% of the weld seams.

If internal examination of welded piping systems through the inspection holes appears to be inadequate or if their reliable assessment is not possible even by ultrasonic testing or an equivalent examination method, it may be necessary to cut out certain parts of pipes. At least 20% of the welding seams are to be inspected for cracks.

4.4 Heating coils in oil tanks and vessels are to be subjected to a pressure test to 1.5 times the allowable working pressure.

The same applies to heating coils in cargo tanks.

H. Thermal Oil Heater Survey

1. External Inspection

Thermal oil plants are to be subjected to a functional test, while in operation. In detail, the following items are to be examined:

- The entire thermal oil plant for leakages,
- The condition of the insulation,
- The functioning of the indication, control and safety equipment,
- The remote controls for the shut-off and discharge valves,
- The leakage monitors for the heaters,
- The emergency switch-off devices (oil firing, pumps),
- The safety switch-off devices for the oil burner
- Lighting, emergency lighting and labelling.

Reference is to be made to the test reports on the annual checks to be performed by an appropriate testing institution for continued used of the thermal oil. This is to be confirmed in the report.

2. Internal Inspection

During the internal inspection the heating surfaces and, where appropriate, the combustion chamber, are to be examined for contamination, corrosion, deformations and leakages.

As a rule, tightness tests are to be carried out to the admissible working pressure. Following repairs and renewals of plant components exposed to pressure, a pressure test is to be carried out to 1.5 times the admissible working pressure.

I. Pressure Vessels Survey

1. General

Subject to A.4.12, pressure vessels are to be inspected internally and externally.

2. Supplementary Testings

Where pressure vessels cannot satisfactorily be 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 times the allowable working pressure PB. If the maximum allowable working pressure is less than 2 bars, then the test pressure should be at least 1 bar more than the maximum allowable working pressure. Pressure vessels manufactured in accordance with DIN 4810 are, subject to that standard, to be tested to 1.3 times the admissible working pressure. The test pressure must in no case exceed the initial test pressure.

3. CO_2 Low-Pressure Fire-Extinguishing Systems

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

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

Following a hydraulic pressure test, the vessels and/or bottles are to be carefully dried.

J. Thickness Measurements and Corrosion Tolerances

1. General

1.1 The thicknesses of structural elements are checked by measurements, in order to assess whether or not the values stipulated in the Construction Rules are observed, taking into account the admissible tolerances. Unless severe corrosion has occurred owing to particular service conditions, thickness measurements will not be required until Class Renewal II.

1.2 Thickness measurements are to be carried out in accordance with recognized methods, by authorized personnel or companies. Rust and contamination are to be removed from the components to be examined. The Surveyor is entitled to require check measurements or more detailed measurements to be performed in his presence. The thickness measurements are to be witnessed by the surveyor on board to the extent necessary to control the process.

The scope of thickness measurement as well as the reporting shall be fixed in a survey planning meeting between the surveyor(s), representatives of the owner and the approved thickness measurement operator/firm well in advance of measurements and prior to commencing the survey.

Thickness measurements of structures in areas where close-up surveys are required shall be carried out simultaneously with the close-up surveys.

2. Authorization

2.1 The personnel or the company entrusted with thickness measurements must be approved by **TL** for this purpose.

2.2 Validity of an approval granted will depend on the continued qualification. The approval will have to be renewed after period not exceeding 3 years.

3. Scope of Measurements

3.1 Main hull structural elements: In Class Renewal II and all subsequent ones the plate thicknesses of the main hull (essential longitudinal and transverse) structural elements are to be checked by measurements. The number of measurements depends on the vessel's maintenance condition and is left to the Surveyor's discretion.

The minimum requirements for thickness measurements on the occasion of class renewal surveys are stated in Table 3.3, depending on the ship’s age. Respective thickness measurements to determine the general level of corrosion are to be carried out.

3.2 The extent of thickness measurements may be reduced, in comparison with those stated in Table 3.2, provided during the close-up examination the Surveyor satisfies himself that there is no structural diminution, and the protective coating, where applied, continues to be effective.

The Surveyor may extend the thickness measurement as deemed necessary. This applies especially to areas with substantial corrosion.

Transverse sections should be chosen where largest corrosion rates are suspected to occur or are revealed by deck plating measurements.

3.3 Seawater ballast tanks: In the case of major corrosion damages, the structural elements of seawater ballast tanks are to be checked by thickness measurements.

3.4 Where special reasons exist, the Surveyor may demand thickness measurements to be carried out already on the occasion of Class Renewal I, also outside the area of 0,5L amidships. The same applies in the case of conversion or repair of a ship.

3.5 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 fourth annual survey.

3.6 **Equipment:** In Class Renewal II and all subsequent Class Renewals the cross sectional areas of the anchor chain cables are to be determined. The mean diameters of the anchor chain cables are to be determined by representative measuring approx. 3 links per length (27,5 m.), made at the ends of the links in way of the maximum wear.

4. Corrosion and Wear Tolerances

4.1 Where thickness measurements according to 3. result in corrosion and wear values exceeding those stated in the following, the respective hull structural elements will have to be renewed.

TL reserves the right where applicable to modify the indicated values according to 4.3 and 4.5.3 referring to the maximum permissible large surface corrosion allowances.

Where reduced material thicknesses were admitted for the newbuilding (effective system of corrosion protection), the permissible corrosion allowances are to be based on the unreduced rule thicknesses.

4.2 Longitudinal strength

Maximum permissible reduction of midship section modulus: 10%.

4.3 Local strength

Maximum permissible large-surface reduction of plate thickness and web thickness of profiles: t_K

for $t \leq 11.5$ mm.: $t_K = 1.5$ mm.

for $t > 11.5$ mm.: $t_K = 0.09\ t + 0.45$ mm.,

max. 3.0 mm.

t = Plate and/or web thickness in [mm], as stipulated in the Construction Rules.

Maximum permissible locally limited reduction of thickness is 0.2 t. However, in some cases, further reductions may be allowed according to “Permissible Reduction of Thickness”.

In ballast tanks in way of 1.5 m. below the weather deck, if the weather deck is the tank deck: $t_K = 2.5$ mm.

In cargo oil tanks in way of 1.5 m. below the weather deck, if the weather deck is the tank deck, and for horizontal structural elements in cargo oil and fuel tanks: $t_K = 2.0$ mm.

In dry cells, such as fore-to-aft passageways of container ships and comparable spaces:

for $t \leq 11.5$ mm.: $t_K = 1.0$ mm.

for $t > 11.5$ mm.: $t_K = 0.09\ t$,
max. 2.5 mm.

For hatch covers of dry cargo holds, $t_K = 1.0$ mm.

Max. permissible surface reduction of the side shell in way of the ice belt: 2.0 mm.

For single skin hatch covers and for the plating of double skin hatch covers, steel renewal is required where the gauged thickness is less than tnet + 0.5 mm.Where the gauged thickness is within the range t_{net} +0.5 mm and tnet + 1.0 mm, coating (applied in accordance with the coating manufacturer's requirements) or annual gauging may be

adopted as an alternative to steel renewal. Coating is to be maintained in good condition.

For the internal structure of double skin hatch covers, thickness gauging is required when hatch cover top or bottom plating renewal is to be carried out or when this is deemed necessary, at the discretion of the surveyor, on the basis of the plating corrosion or deformation condition. In these cases, steel renewal for the internal structures is required where the gauged thickness is less than tnet.

For corrosion addition t_K = 1.0 mm the thickness for steel renewal is tnet and the thickness for coating or annual gauging is when gauged thickness is between tnet and tnet + 0.5 mm.

4.4 Anchor equipment

Maximum permissible reduction of diameter of chain links 12%.

Maximum permissible reduction in weight of anchors: 10%.

4.5 High speed craft

4.5.1 For high-speed (seagoing) craft as defined in the **TL** Construction Rules the following corrosion and wear tolerances apply.

4.5.2 Longitudinal strength

Maximum permissible reduction of midship section modules: 10%

4.5.3 Local strength

Where applicable, maximum permissible large surface reduction of plate thickness of profiles: t_K

for t ≤ 10.5 mm.: t_K = 0.5 mm.

for t > 10.5 mm.: t_K = 0.03 t + 0.2 mm.,

max. 1.0 mm.

Tank bottoms: 1.0 mm.

Maximum permissible locally limited reduction of thickness: 0.1 t.

If the measures for corrosion protection described in the Rules for high speed craft, Chapter 7 - High Speed Craft, Section 3, K.3.1.5 are fully applied, the corrosion reduction t_k can be assumed as 0.0 mm. for steel and the aluminium alloys described in K.3.2.3.

4.5.4 For anchor chain cables the maximum permissible reduction of the mean diameter of chain links is 10%.

K. Surveys for Special Ship Types

1. Inland Vessels

1.1 General requirements

1.1.1 The following rules relate to inland vessels.

1.1.2 Unless otherwise stated in the following, the rules in subsections A apply, as far as of relevance for inland vessels.

1.1.3 In case of inland vessels annual surveys are required for steam boilers only.

1.1.4 As a matter of principle, the class period for hull and machinery is identical. However, surveys and inspections performed in accordance with items 1.3 and 1.4 respectively may be recognized for the class renewal, even if conducted more than 15 months before the date of expiry of the class.

1.1.5 Records on the periodical inspections of steam boilers, thermal oil heaters, pressure vessels and piping systems are entered into special inspection certificates to be kept on board.

1.2 Intermediate surveys

1.2.1 General

Intermediate surveys will be carried out about 2.5 years, but not later than 3 years, after commissioning and each class renewal. The survey may be affected with the ship afloat and will in general cover an external check of the main hull elements and of all components which are of significance for the vessel's safety such as the steering gear, the machinery, including the electrical installation, and pressure vessels with their safety devices.

1.2.2 Machinery installations, general

1.2.2.1 The following items are to be checked:

- Main and auxiliary machinery, with accessories,
- Electrical machinery and pertinent switch gear, including cables.

1.2.2.2 The automation equipment is to be checked in accordance with TL Survey programme.

1.2.2.3 For internal surveys of steam boilers, see 1.3.4.7.

1.2.2.4 Steering gear

The steering gear is to be function-tested.

1.2.3 Machinery installations, safety systems (tankers)

On tankers the following installations and equipment are to be checked:

- Electrical equipment, in particular electrical installations in areas of explosion hazard, in which ignitable gas mixtures or water vapours may accumulate,
- Level/overfill alarms,
- Level indicators,
- Tank venting systems,
- Flame arresters,
- Pipings, valves and fittings, pumps,
- Pump room equipment, including ventilation system,
- Fire-extinguishing equipment.

1.2.4 Dry docking

Intermediate surveys have to be carried out in dry-dock;

- If the vessel's shell is riveted,
- If the vessel's age exceeds 20 years and if required by the Surveyor.

1.3 Class Renewal Surveys

1.3.1 Hull, general

1.3.1.1 The class renewal survey will be held while the ship is in dry-dock or on the slipway. The ship has to be placed on blocks of sufficient height so as to allow the keel, bottom plating, rudder, propeller and propeller shaft to be inspected.

1.3.1.2 The survey will cover all structural elements of the ship and all component parts essential for her operation and safety, such as steering gear, watertight doors, hatchways, capstans and windlasses, anchors, cables and hawsers, as well as fire protection installations.

1.3.1.3 In order to render possible inspection of all inner structural elements, such as frames, floor plates, stringers, shell plating, decks, deck beams, bulkheads, ceiling, inner bottom, the cargo holds and all cargo tanks are to be emptied and cleaned and -where necessary- freed of gas. Service tanks (fuel, lubricating-oil and fresh-water tanks) need not be emptied if their tightness, while completely filled, is proved by means of an external inspection.

1.3.1.4 If deemed necessary, the Surveyor may require the rust to be removed from selected areas of the ship's structure and have the thickness of the shell plating, of the built-in tanks, the walls of which do not form part of the shell plating, of the decks and bulkheads measured by recognized test methods (e.g. ultrasonic measurements). Defective coverings (e.g. cement and asphalt) must be removed in accordance with the Surveyor's instructions. Prior to renewing paintwork or coverings, the ship's steelwork concerned is to be inspected.

1.3.1.5 On the occasion of each survey, at least one bottom ceiling strake on either side and near of the centre keelson and one strake each of the bottom and bilge ceiling at the ship's sides will have to be removed in each compartment over their entire length in order to allow the inner surface of the bottom plates to be inspected. At every third survey, at least one third of the

ceiling will have to be removed at the Surveyor's discretion.

1.3.2 Hull, tankers

1.3.2.1 On tankers which -as can be proved- have exclusively carried cargo not causing corrosion, the cargo tanks shall be inspected at every other class renewal only, provided that it may be assumed on the basis of random checks that the component parts are still in satisfactory condition, and provided that no objections will result from the pressure tests as per 1.3.2.2.

1.3.2.2 During each class renewal, the cofferdams of tankers are to be hydrostatically tested to the test pressure as defined in the Construction Rules for Inland Steel Ships. At every other class renewal, in tankers, the cargo tanks are to be tested by water and/or air pressure, to the test pressure stated in the Rules.

Where substances are carried which cause corrosion in connection with water, the kind of testing is to be specified.

1.3.2.3 At every class renewal, tanks of tankers carrying acids and lyes will be subjected to an internal examination and, at every other class renewal, to a hydrostatic pressure test. The test pressure to be fixed in accordance with the Construction Rules depends on the density of the cargo.

1.3.2.4 Tanks for the carriage of pressurized liquefied gases are to be tested like pressure vessels. Deviating there from, cargo tanks need to be subjected to an internal inspection on the occasion of every other class renewal only, if in these tanks only gases or gas mixtures have been carried, which have no corrosive effect upon their walls, and if random checks suggest that the tanks are in satisfactory condition.

1.3.3 Tankers, piping systems

Cargo pipings, including valves and fittings, pumps as well as gas-freeing and safety equipment are to be surveyed.

At each class renewal, the loading and discharge pipes of tankers are to be tested to 1.2 times the allowable working pressure.

1.3.4 Machinery

1.3.4.1 The class renewal survey includes the surveys and checks mentioned in 1.2.

1.3.4.2 The main and auxiliary machinery, including the electric generators, may also be inspected on the occasion of overhaul work of the machinery plant. The survey dates will be fixed by **TL**, taking into account the intervals between repairs as recommended by the engine manufacturers.

Where, owing to service periods, intervals between repairs of main propulsion engines exceed a period of class, an inspection is to be provided for, permitting the condition of engine components subject to wear to be assessed. The inspection will also cover the couplings, gears and adjacent shafts and bearings.

1.3.4.3 Electrical installations

1.3.4.3.1 The electrical installation in the engine room, in the compartments and on deck will be checked, including cables, wires, distributors, etc. The windings of the electric generators and motors for essential auxiliary machinery will be checked for their condition, as will be parts subject to wear, such as collectors, slip rings and carbon brushes.

1.3.4.3.2 On tankers, the electrical installations and equipment are to be checked for compliance with the relevant explosion protection requirements.

1.3.4.4 The automation equipment is to be checked in accordance with **TL** survey programme.

1.3.4.5 All pressure vessels will be surveyed internally and externally during each class renewal.

For pressure vessels, which cannot be properly inspected internally or the condition of which cannot be ascertained during the internal inspection, either a non-destructive testing method is to be applied or, additionally, a hydrostatic test is to be performed.

The hydrostatic test will be conducted to 1.5 times the maximum allowable working pressure. Pressure tanks according to DIN 4810 are to be tested to a test pressure of 5.2 and 7.8 bar respectively, depending on

their pressure stage, i.e. 4 or 6 bars. In no case must the test pressure exceed the initial test pressure.

1.3.4.6 Supply steam pipings and cargo heating equipment, such as steam heating coils in oil bunkers/vessels and cargo tanks will be surveyed and subjected to a hydrostatic test to 1.5 times the maximum allowable working pressure. Random checks of the inner condition of the pipings, in particular of the pipe bends, may likewise be demanded, or additional examinations may be required.

1.3.4.7 Boiler installations

For inspections of steam boilers, see A.4.10 and G.

External inspections are to be carried out annually and internal inspections on the occasion of each intermediate survey and class renewal.

1.3.4.8 Thermal oil plants

Thermal oil plants are to be subjected to periodical surveys.

External inspections are to be performed on the occasion of each intermediate and class renewal survey. Proof of continued usability of the thermal oil shall be furnished annually by a competent testing institution.

Internal inspections, including a tightness test of the whole plant, are to be performed at intervals of 5 years, counting from commencement of initial operation and possibly in connection with a class renewal survey.

1.4 Periodical Surveys of Propeller and Stern Tube Shafts

1.4.1 Survey intervals

1.4.1.1 Propeller and stern tube shafts are to be drawn for inspection, at intervals of 5 years (SW). For exception, see 1.4.1.2.

1.4.1.2 Propeller and stern tube shafts

- Mechanically grease-lubricated or,
- With oil sealing glands and oil-lubricated bearings or
- Made of corrosion-resistant material may be subjected to a modified survey (SWM) at intervals of 5 years, unless the survey results require drawing of the shafts.

1.4.1.3 Omni directional propellers for main propulsion purposes are subject to the same survey intervals as propeller and stern tube shafts.

1.4.1.4 Within the scope of complete or modified surveys of the propeller shaft, the remote and local control gear of controllable-pitch propellers is to be surveyed at the Surveyor's discretion.

1.4.1.5 The aforementioned surveys may be carried out with a time window of ±6 months, independent of the other surveys for class renewal.

1.4.2 Scope of surveys

1.4.2.1 Survey of the drawn shaft (SW)

As far as applicable, the survey of drawn shaft covers:

- The shaft in its entirety, especially the cone, the keyway and thread, or the fillet of the flange,
- Checking for true running,
- Non-destructive examination of the aft part of the shaft by approved crack detection methods,
- Examination of the oil sealing glands and the chrome steel liner,
- Examination of the contact surfaces and liners of the shaft,
- Examination of the stern tube bearing,
- Examination of the propeller (fit and general condition),
- Examination of the bearing clearances before and after the survey.

The gearing and control elements of omnidirectional propellers for main propulsion purposes are to be exposed for the survey.

1.4.2.2 Modified Survey (SWM)

As far as applicable, the scope of the modified survey covers;

- All accessible parts of the shaft, including the propeller connection to the shaft,
- Checking for true running,
- The propeller,
- Checking of the oil sealing glands,
- Measurement of the clearances of the stern tube bearings,
- Non-destructive examination of the aft part of the shaft by approved crack detection methods.

The modified survey (SWM) also applies to omnidirectional propellers as per 1.4.2.1, if their gearing and control elements can be surveyed through inspection openings.

1.5 Class extension surveys

On owners' special application, following surveys of hull and machinery afloat, **TL** may within two periods of class, extend the class by no more than 12 months in total, provided that the surveys show that hull and machinery are in unobjectionable condition.

In that case, the last survey in dry-dock must not date back more than 5 years, counting from the date of the respective class renewal survey. With ships of over 20 years of age or the hull structural elements of which are riveted, the last survey in dry-dock must not date back more than 3 years.

1.6 Damage and Repair Surveys

Every damage affecting the safety of the ship or her machinery or endangering her cargo must be reported to **TL** and be inspected by a Surveyor prior to commencement of repair work.

1.7 Conversion and modification surveys

All conversions and modifications of component parts covered by the Construction Rules must be carried out under Surveyor supervision.

Conversion drawings will have to be submitted to the **TL** and approved prior to commencement of work.

Hull and machinery components and parts of the equipment may have to be replaced if, subject to the Construction Rules, they are inadequate in dimensions and size for the converted or modified ship. **TL** may, however, grant exemptions.

2. Floating Docks

2.1 General

2.1.1 For floating docks subject to classification by **TL**, unless otherwise agreed, class renewal surveys are to be conducted at intervals of 5 years.

2.1.2 Floating docks which are not classified may on application be subjected to a condition survey, e.g. prior to sale or conversion.

2.1.3 If classification is intended, the procedure to be followed regarding documents to be submitted and the scope of surveys for classification is analogous to that outlined in Section 2, B.3. Structural plans of the essential structural elements of the dock structure and particulars on their machinery and equipment are to be submitted for approval.

2.2 Class Renewal Surveys

2.2.1 Dock structure

2.2.1.1 For class renewal, the dock structure should be immersed as little as possible; the structural elements above the waterline will be inspected both, internally and externally, and the watertight compartments internally only, at the Surveyor's discretion. Particular attention is to be paid to the pipings arranged inside the compartments, including

their valves; these, as well as the inlet and outlet valves, are to be checked for tightness and operability.

2.2.1.2 The partition bulkheads of the watertight compartments are to be checked for tightness and tested by compressed air (max. 0.2 bar). The compartments to be tested will be selected by the Surveyor, depending on the age and general condition of the dock; however, at least every other compartment is to be tested.

2.2.1.3 If only every other compartment is pressure-tested, on the occasion of a trial docking also the tightness of the safety deck is to be tested.

2.2.1.4 Thickness measurements as parts of the dock structure are to be carried out on the occasion of every other class renewal, and/or the Surveyor may require them to be carried out, if he suspects an inadmissible degree of corrosion.

2.2.1.5 Dry dockings or bottom surveys with the dock in inclined position will be confined to particular cases (averages, leakages, etc.) upon agreement between owners/operators and **TL**.

2.2.2 Machinery equipment

The machinery equipment for operation of the dock, including the electrical equipment, is to be surveyed and checked analogously to the procedure outlined in D.3, as far as applicable.

2.2.3 Equipment

The equipment required for operation of the dock, e.g. bilge and keel blocks and -if fitted- their drives, warping capstans, cranes, bridge connections, shore connections and the dock mooring equipment are to be covered by the condition survey.

Changes introduced since the last class renewal are to be documented.

3. Oil Recovery Vessels

3.1 General requirements

3.1.1 Application

3.1.1.1 The following instructions refer to oil recovery vessels as defined by the TL Construction Rules.

3.1.1.2 Unless otherwise stated in the following, the rules as per A, B.3.6, B.4.5, C.3.5, C.4.2, D.2.6 and D.3.2 apply.

3.1.2 Extent of surveys

3.1.2.1 The surveys are to cover installations, outfit and equipment for:

- Operation in oil covered waters,
- Recovering oil floating on the water,
- The carriage and handling of oil cargo.

They also cover the surveys required by the SOLAS regulations for oil tankers.

The protective equipment and the safety equipment required by the SOLAS regulations for protection of the personnel as well as other equipment and outfit, which are no class requirement items, are not covered by the present Rules for Classification and Surveys. These items will, however, be included in the surveys, if compliance with the requirements of an flag state has to be certified.

3.1.2.2 Hull: The following requirements under 3.2. to 3.4. define the minimum extent of examinations. The surveys shall be extended where substantial corrosion and/or structural defects are found, and will include an additional close-up survey where deemed necessary by the Surveyor.

3.1.3 Documents to be carried on board

The following information is to be readily available for the Surveyor's use in connection with the survey:

- Operations and equipment manual
- Maintenance records for the gas detection and alarm system

and any information that will help to identify suspect areas requiring inspection.

3.1.4 Access to structures

3.1.4.1 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 it to be duly examined without any risk.

3.1.4.2 For close-up surveys in cargo and salt water ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- Permanent or temporary staging,
- Passages through structures,
- Lifts and moveable platforms,
- Boats or rafts,
- Other equivalent means.

3.1.5 Survey at sea

Upon prior agreement with the owner, **TL** may carry out surveys at sea or at anchorage, provided the

Surveyor is given the necessary assistance, including safety equipment, by the personnel on board.

3.2. Annual Surveys

3.2.1 General

3.2.1.1 In addition to the surveys as stipulated in B, the following installations, structural elements, items of equipment and outfit, including facilities for handling and carriage of the oil cargo, are to be surveyed in order to ensure that they are maintained in satisfactory condition.

Prior to inspection, the Surveyor shall examine the documentation required to be kept on board for this type of vessel, as a basis for the survey.

3.2.1.2 The annual survey is to ensure that the equipment for operation in oil-covered waters and for oil recovery as well as the cargo handling installations and pertinent safety equipment are in good working order.

For the aforementioned surveys normally access to cargo holds or other spaces within the cargo area necessitating gas-freeing is not required, unless checking of the equipment for correct functioning is not possible otherwise.

3.2.2 Installations on the weather deck

On the weather deck the oil recovery equipment will have to be surveyed and/or checked.

3.2.3 Pump rooms

Equipment in pump rooms and other enclosed spaces used during oil recovery and cargo handling operations is to be checked, in particular as to leakages and potential sources of danger.

3.2.4 Equipment for operation in oil-covered waters

The following equipment for operation in oil-covered waters is to be visually examined and to be checked:

- Air locks,
- Arrangements for affecting the closures necessary for explosion protection,
- Ventilation system for pressurizing accommodation and machinery spaces,
- Vapour detection and alarm systems and portable gas detection equipment.

3.2.5 Electrical installations

In gas-dangerous spaces and zones the electrical equipment, including cables and their supports is to be visually examined, particularly regarding explosion protection.

3.2.6 Fire-extinguishing systems

The scope of survey of the fire-extinguishing systems is as specified in B 4.1.

3.3 Intermediate surveys

3.3.1 General

In addition to the surveys and checks listed in item 3.2 above, on the occasion of the second or the third annual survey the checks mentioned below will be carried out. If deemed necessary by the Surveyor, apart from the survey a functional test will be performed.

3.3.2 Installations in the cargo area

3.3.2.1 Irrespective of the vessel's age the condition of the cargo, oil recovery, tank cleaning, bunkering, ballast, steam and venting systems, as well as of the ventilation and ventilator heads are to be checked. In cases of doubt pressure tests and/or wall thickness measurements may be demanded.

Cargo tank high velocity vent and pressure/vacuum valves are to be function tested, and if deemed necessary by the Surveyor, to be opened up and re-adjusted.

3.3.2.2 In the case of oil recovery vessels beyond this, the following are to checked:

- Drainage of cargo tank vent lines,
- Bonding devices of all piping systems and independent cargo tanks,
- Cargo hoses (repeat test, if needed),
- Sea inlet discharge valves,

3.3.3 Ballast and cargo tanks

For the scope of the surveys refer to C.3.1.

3.3.4 Thickness measurements

Thickness measurements have to be carried out in sections found to be suspect on occasion of the previous class renewal survey.

In case of substantial corrosion the extent of the thickness measurements is to be increased.

3.3.5 Electrical installations

For the scope of the surveys refer to C.4.1.

3.4 Class Renewal Surveys

3.4.1 General requirements

3.4.1.1 In addition to the class renewal surveys of the ship's hull, the machinery plant and electrical installation, the cargo system, the oil recovery system and pertinent safety devices listed in 3.3.2 for intermediate survey are to be subjected to through examination and testing for proper functioning at the surveyor's discretion.

It is to be verified that the relevant instructions, documentation and information material, such as cargo handling plans, cargo tank loading limit information, etc. are kept on board.

3.4.1.2 The class renewal survey of cargo handling installations and related control, alarms and safety devices cannot normally be carried out during loading or discharging operations and is preferably to be carried out with the ship in gas-free condition.

3.4.1.3 Spaces and areas used in connection with cargo handling (e.g. cargo control rooms and pump rooms), are to be examined with respect to their general condition and possible sources of danger. All accessible gas-tight bulkhead penetrations including gastight shaft sealings are to be visually examined.

3.4.1.4 The equipment for operation of the vessel in oil-covered waters has to be subjected to through surveys and operational tests.

3.4.2 Hull

3.4.2.1 General requirements

3.4.2.1.1 All cargo tanks, sea water ballast tanks including double bottom tanks, pipe tunnels, coffer-dams and void spaces bounding cargo holds, decks and outer hull are to be examined. This examination is to be supplemented by thickness measurements and tank testing as deemed necessary to ensure that the structural integrity continues to be given.

The examination is to be sufficiently through for revealing substantial corrosion, significant deformations, fractures, damages or other structural deteriorations.

3.4.2.1.2 All piping systems within the above spaces are to be examined and tested under working conditions to ensure their continued satisfactory condition.

Special attention is to be given to ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces.

3.4.2.1.3 The survey extent of combined ballast / cargo holds is to be determined based on the records of ballast history.

3.4.2.2 Surveys

3.4.2.2.1 An overall survey of all tanks and spaces is

to be carried out.

3.4.2.2.2 The scope of Close-up surveys shall be established based on the requirements shown in Table 3.15, or for double hull vessels, Table 3.16, depending on following items:

- Age of the vessel,
- Operation profile of the vessel during the last period of class.

The surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tanks under survey and the condition of the corrosion protection system, and also in the following cases;

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

3.4.2.2.3 Corrosion protection: Where provided, the condition and/or function of coating or corrosion protection of ballast tanks are to be examined.

3.4.2.3 Thickness measurements

3.4.2.3.1 The scope of thickness measurements shall be established based on the requirements shown in Table 3.18, depending on following items:

- Age of the vessel,
- Operation of the vessel during the last period of class,
- Results of the close-up surveys according to 3.4.2.2.2.

3.4.2.3.2 Transverse sections should be chosen where largest corrosion rates suspected to occur or are revealed by deck plating measurements.

In cases where three sections are to be measured, at least one should include a ballast tank within 0.5 L amidship.

3.4.2.4 Tank testing

3.4.2.4.1 The scope of tank testing shall be established based on the requirements shown in Table 3.21, depending on following items:

- Age of the vessel,
- Operation of the vessel during the last period of class,
- Results of the close-up surveys according to 3.4.2.2.2,
- Results of the thickness measurements according to 3.4.2.3.

3.4.3 Cargo area equipment

3.4.3.1 Cargo, oil recovery and ballast piping systems, including valves and fittings, are to be internally inspected for corrosion as deemed necessary by the Surveyor. Subsequently, a pressure test is to be carried out.

3.4.3.2 Cargo, stripping, oil recovery, and ballast pumps are to be examined and checked. Pressure relief valves of pumps are to be function tested.

3.4.3.3 Cargo tank high velocity vent and pressure/ vacuum valves are to be overhauled, adjusted by makers/recognized firm and tested under supervision of a Surveyor.

3.4.3.4 Tank venting systems are to be examined; flame arresters are to be opened as far as necessary, and cleaned.

3.4.3.5 Cargo tank heating systems are to be examined and pressure-tested to 1.5 times the operating pressure.

3.4.3.6 The bilge systems of pump rooms are to be inspected and tested.

3.4.3.7 All ventilation systems in the cargo area, including portable fans are to be examined and function-tested.

3.4.3.8 The following equipment is to be function-tested:

- Level indicators of cargo tanks,
- Liquid level alarms,
- Overflow controls,
- Pressure and temperature alarms,
- Remote-control systems of cargo pumps,
- Sampling arrangements of cargo tanks, if fitted.

3.4.4 Equipment for operation in oil-covered waters

The equipment for operation in oil-covered waters and the pertinent safety equipment has to be subject to through surveys and operational tests.

3.4.5 Electrical installations

In addition to the inspection and testing as per 3.3.5 the protection devices of electric motors are to be tested.

4. Barges and Pontoons

4.1 General

4.1.1 Scope

Survey requirements specified in this item are to apply to steel barges and pontoons notwithstanding the requirements specified in other items of this section.

4.1.2 General requirements

4.1.2.1 The general requirements on periodical surveys are to follow the requirements specified in Section 2 and 3.

4.1.2.2 Notwithstanding the requirement in 4.1.2.1, periodical surveys for barges and pontoons not engaged in international voyages or those less than 24 m. in length are to comply with the following:

4.1.2.2.1 Annual surveys specified A.4.1 are not required to be carried out.

4.1.2.2.2 Intermediate surveys specified in A.4.2 are to be carried out within 3 months (before or after) of the second or third anniversary date.

4.1.2.2.3 Surveys other than annual and intermediate surveys are to be carried out in accordance with the requirements in A.4.3, A.4.7, A.4.10 and A.4.13.

4.2 Annual survey

4.2.1 General

4.2.1.1 For survey items deemed necessary by the surveyor, surveys equivalent to class renewal surveys may be carried out.

4.2.1.2 Annual surveys for machinery are not carried out.

4.2.2 Annual survey for hull and equipment

At annual surveys for hull and equipment, surveys applicable to the barge's and pontoon's construction and equipment are to be performed according to the requirements specified in B.

4.3 Intermediate survey

4.3.1 General

For survey items deemed necessary by the surveyor, surveys equivalent to class renewal surveys may be carried out.

4.3.2 Intermediate survey for hull and equipment

At intermediate surveys for hull and equipment, surveys applicable to the barge's and pontoon's construction and equipment are to be performed according to the requirements specified in C.

4.3.3 Intermediate survey for machinery

In the intermediate survey for machinery, open-up inspection of auxiliary generator engines, auxiliary

machinery, heat exchangers and air tanks that are used as parts of important systems are to be performed. These open-up inspections may be dispensed with, however, where it is verified that this machinery is in satisfactory condition as a result of a general examination and investigation of the maintenance records by the surveyor.

4.4 Class renewal surveys

4.4.1 Class renewal survey for hull and equipment

Class renewal surveys for hull and equipment are to be in accordance with the relevant requirements specified in D.2 corresponding to the barges's and pontoon's structure and equipment.

4.4.2 Class renewal survey for machinery

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

4.5 Bottom survey

4.5.1 For bottom surveys of the barge and pontoon, bottom survey items related to barges and pontoons in the requirements of E. are to be carried out.

4.6 Boiler survey

4.6.1 Boiler surveys are to be carried out in accordance with G.

5. Fishing Vessels

See special rules for Classification and Construction of Fishing Vessels.

6. Yachts

See special rules for Classification and Construction of Yachts.

7. High Speed Crafts

See special rules for Classification and Construction of High Speed Crafts.

8. Dynamic Positioning Systems

See special **TL** rules for Classification and Construction of Dynamic Positioning Systems.

9. Diving Systems

See special **TL** rules for Classification and Construction of Diving Systems.

10. Submersibles

See special **TL** rules for Classification and Construction of Submersibles

11. Underwater Equipment

See special **TL** rules for Classification and Construction of Underwater Equipment.

12. Offshore Installations

See special **TL** rules for Classification and Construction of Offshore Installations.

13. Multi-point Mooring Systems

See special **TL** rules for Classification and Construction of Multi-point Mooring Systems.

14. Wind Turbines

See special **TL** rules for Classification and Construction of Wind Turbines.

L. Additional Safety Measures for Bulk Carriers

1. Strength Evaluation of the Foremost Cargo Hold

The strength of the transverse watertight corrugated bulkhead between cargo holds No. 1 and 2 **(5)** and the

allowable hold loading **(6),** i.e. the strength of the internal structure of the double bottom in hold No. 1 have to be evaluated for flooded condition of the foremost cargo hold.

This applies to existing bulk carriers of 150 m. in length and above, intended to carry solid bulk cargoes having a density of 1,78 t/m^3, or above, with single deck, top-side tanks, hopper tanks and single side shell or double skin construction of less than 760 mm. breadth.

In connection with this strength calculation additional thickness measurements have to be taken of the aforementioned structures. Renewal and strengthening required are to be approved by **TL**. Thickness measurements and strength calculations are to be performed at all subsequent Intermediate Surveys (for ships over 10 years) and Class Renewal Surveys.

2. Damage Stability Requirements

Bulk carriers of 150 m. in length and above of single side skin construction have to comply with the damage stability requirements as specified in SOLAS Reg. XII/4.

For possible exemptions refer to SOLAS Reg. XII/9

3. Cargo Hold Hatch Cover Securing Arrangements

Bulk carriers which were not built in accordance with the particular requirements **(7)** for evaluation of the scantlings of hatch covers and hatch coaming of cargo holds have to comply with the additional requirements **(8)** for cargo hatch cover securing arrangements.

4. Side Shell Frames and Brackets

Single side bulk carriers which were not built in accordance with the particular requirements **(9)** for side structures, as well as Oil/Bulk/Ore (OBO) carriers, have to be assessed for compliance with the respective renewal criteria for side shell frames and brackets **(10).**

In connection with this, additional thickness measurements and strength calculations have to be performed for the aforementioned structures. Renewal and strengthening required are to be approved by **TL**. Thickness measurements and strength calculations have to be performed at all subsequent intermediate and Class Renewal Surveys**.**

5. Strength and Securing of Small Hatches on Exposed Fore Deck

All bulk carriers have to comply with the requirements **(11)** concerning the strength and securing devices for small hatches fitted on the exposed fore deck.

Those hatches are designed for access to spaces below deck and are capable to be closed weather-tight or watertight, as applicable. There opening is normally 2.5 square meters or less.

6. Strength of Fore Deck fittings and Equipment

All bulk carriers have to comply with the requirements **(12)** concerning the strength of air pipes, ventilator pipes and their closing devices and windlasses.

7. Restriction from Sailing with any Hold Empty

Bulk carriers of 150 m. in length L and upwards of single-side skin construction carrying dry cargoes having a density of 1,780 kg/m^3 and above, have to comply with the requirements **(13)** concerning the loading of cargo holds in full load condition (at least 90% of ship's deadweight). Requirements are applicable after the vessel reaches 10 years of age and only if the vessel meets not the requirements for withstanding flooding of any one cargo hold.

(5) *For requirements see UR S 19 of IACS.*

(6) *For requirements see UR S 22 and S 23 of IACS.*

(7) *For requirements see UR S 21 of IACS.*

(8) *For requirements see UR S 30 of IACS.*

(9) *For requirements see UR S 12 of IACS.*

(10) *For requirements see UR S 31 of IACS.*

(11) *For requirements see UR S 26 of IACS.*

(12) *For requirements see UR S 27 of IACS.*

(13) *For requirements see SOLAS XII/14.*