RULES
FOR THE
CLASSIFICATION
OF INLAND
NAVIGATION VESSELS

PART 1
CLASSIFICATION
AND SURVEYS

Croatian
Register of
Shipping

June
2018
RULES
FOR THE CLASSIFICATION OF
INLAND NAVIGATION VESSELS

Part 1 – CLASSIFICATION AND SURVEYS

June 2018

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By the decision of the General Committee of Croatian Register of Shipping,

RULES FOR THE CLASSIFICATION OF INLAND NAVIGATION VESSELS
PART 1 – CLASSIFICATION AND SURVEYS

have been adopted on 29th May 2018 and shall enter into force on 5th June 2018
1. HISTORICAL RECORD

- Croatian Register of Shipping (hereinafter referred to as CRS) is a heritor of ship classification activities at the eastern Adriatic coast.
- The Austrian Veritas was founded in this area, already in 1858, as the third classification society in the world.
- In 1918 the Austrian Veritas changed its name into the Adriatic Veritas and was acting as such till year 1921.
- CRS, acting till 1992 as JR (Yugoslav Register of Shipping), was founded in 1949.
- CRS Head Office is situated in Split, Republic of Croatia.
- CRS is the classification society, member of International Association of Classification Societies (IACS), starting from May 2011.
- From April 1973 till January 2005, when IACS generally discontinued associate status, CRS was an associate IACS member.
- CRS is certified by British Standards Institution (BSI) confirming that CRS operates the Quality Management System which complies with the requirements of BS EN 9001:2015 for the scope of classification and statutory certification of ships, statutory certification of marine equipment and recreational crafts, and BSI Annual Statement of Compliance confirming that CRS Quality Management System complies with IACS Quality System Certification Scheme.

2. STATUS

- CRS is an independent, not for profit but common welfare oriented, public foundation performing:
  - classification of ships;
  - statutory certification of ships on behalf of the national Maritime Administrations;
  - statutory certification of recreational crafts;
  - certification of materials and products;
  - conformity assessment of recreational crafts;
  - conformity assessment of marine equipment;
  - conformity assessment of pressure vessels;
  - certification / registration of quality management systems.
- The present status of CRS is defined by the Law on Croatian Register of Shipping (OFFICIAL GAZETTE No. 1996/81, as amended with No. 2013/76) and Charter of CRS.

3. MISSION

- CRS mission in the field of classification and statutory certification is to promote the highest internationally adopted standards in the safety of life and property at sea and inland waterways, as well as in the protection of the sea and inland waterways environment.

4. LIABILITY

1. CRS is neither, and nor may be considered as, an Underwriter, Consulting Engineer, Naval Architect, Shipbuilder, Shipowner or Operator, and cannot assume or be exposed to the obligations and responsibilities incumbent on such functions, even though experience of CRS enables it to answer enquiries concerning matters not covered by its Rules, Recommendations, Guidance notes, Instructions, Documents or other evidence.
2. Practices and procedures of CRS are selected by CRS in its sole and absolute discretion based on its experience and knowledge, and in conformity with generally accepted professional standards in the relevant field of the classification Societies.
3. Nothing contained herein, or in any information, report, certificate or like document issued in connection with or pursuant to the performance by CRS of its services, shall be deemed to relieve any designer, naval architect or engineer, shipbuilder or manufacturer, shipyard, seller, supplier, contractor or subcontractor, repairer, or owner, operator, manager or any other person or entity from any warranty or other contractual obligations or responsibilities, expressed or implied or from any negligent act, error or omission whatsoever, nor may create any right, claim or benefit to any third party.
4. CRS shall exercise due diligence in selection or appointment of its surveyors and all other personnel whose attendance and work is employed or engaged for the purpose of performing its services.
5. Nevertheless, if any person or entity uses services of CRS and suffers loss, damage or expenses thereby, which is attributable or proved to have been caused by any negligent act, omission or error of the surveyors, servants, agents, appointees, officers, managers or directors of CRS or purporting to act in the name and on behalf of CRS, or any negligent inaccuracy, advice, report or evidence is given by or in the name of and/or on behalf of CRS, then the liability of CRS is limited in respect of any direct or indirect claim whatsoever to an amount not exceeding five times the amount of the fee charged or chargeable by CRS for the relevant service.
6. Where the fees are related to a number of services, the amount of fees shall be apportioned for the purpose of the calculation of the maximum compensation of the limited liability, as established by the preceding paragraph, in accordance with the estimated time involved in the performance of each service.
7. Any liability for consequential damages is expressly excluded.
8. These rules (General Conditions) are construed and interpreted in accordance with the English Law.
9. Any dispute arising out of the services rendered by CRS shall be referred to the Permanent Arbitration Court with the Croatian Chamber of Commerce in Zagreb, Republic of Croatia.
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Rules for the classification of Inland Navigation Vessels
June 2018
I  PRINCIPLES OF CLASSIFICATION

1  THE RULES

1.1  Purpose of the Rules

1.1.1  Rules for the Classification of Inland Navigation Vessels (hereafter referred to as: the Rules) developed by the CROATIAN REGISTER OF SHIPPING (hereafter referred to as: the Register) are prescribing requirements for the assignment and the maintenance of class for inland navigation vessels as well as vessels operated in restricted maritime stretches of water.

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

1.1.2  The Rules consist of the following parts:

Part 1 – Classification and Surveys;
Part 2 – Hull and Hull Equipment;
Part 3 – Machinery, Systems and Electricity;
Part 4 – Additional Requirements for Notations.

1.1.3  When and if applicable for inland navigation vessels, other Rules of the Register, e.g. Rules for High Speed Craft, Rules for Materials and Welding, Rules for Vessels made of Wood, Aluminium Alloys and Reinforced Plastics may be used (see Figure 1.1.1).

1.1.4  Parts of the Rules are divided in Chapters, Sections, Heads, Items and Sub-items. For this purpose a maximum of six digit decimal system has been adopted throughout, e.g.:

<table>
<thead>
<tr>
<th>A.</th>
<th>B.</th>
<th>C.</th>
<th>D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates Section number</td>
<td>indicates Head number</td>
<td>indicates Item number</td>
<td>indicates Sub-item number</td>
</tr>
</tbody>
</table>

Title numbers of Parts and Chapters of the Rules are given in page headers.

The cross-referencing within the text is as follows:

1. if the text is in the same Part and in the same Chapter of the Rules, e.g. see requirements in 2.7.1.1 (i.e. down to Sub-item number);
2. if the text is in the same Part, but in different Chapter of the Rules, e.g. see requirements as stated in the present Rules, Chapter II, 1.2.2 (i.e. down to Item number);
3. if the text is in the Rules, but in another Part of the Rules, e.g. see requirements as stated in the Rules, Part 25 – Metallic materials, 2.3 (i.e. down to Head number).

The cross-reference for Figures, Tables and Formulas is as follows:

1. if the Table (Formula or Figure) is in the same Part and in the same Chapter of the Rules, e.g. as shown in Table 3.4.2-1 (table number is composed of Section (3), Head (4), Item (2) and Table (1) number);
2. if the Table (Formula or Figure) is in the same Part, but in different Chapter of the Rules, e.g. as shown in the present Rules, Chapter I, Table 4.2.2-1;
3. if the Table (Formula or Figure) is in the Rules, but in another Part of the Rules, e.g. as shown in the Rules, Part 2 – Hull and Hull Equipment, Chapter III, Table 3.1.2-1.

1.2  Scope of the Rules

1.2.1  The Rules are applicable, with no consideration of navigation area, to:

1. new inland navigation vessels;
2. existing inland navigation vessels, in cases of significant repairs, modifications, reconstruction, conversion or alternations of the equipment, as well as, when the purpose of the vessel, navigation area or number of the passengers which the vessel is permitted to carry has been changed, in extent deemed necessary by the Register on a case by case basis;
3. existing vessels, except for those stated in 1.2.1.2 solely if it is explicitly specified in the Rules;
4. existing vessels in the case of admission to class (classification after construction);
5. floating establishment, floating object, floating equipment in extent as deemed necessary by the Register on a case by case basis;
6. all other type of vessels provided that their structural elements or any installations are found to be equivalent for the respective Character of classification including class Notations regarding design, function and structural safety of the vessel.

1.2.2  The Rules are prescribing technical standards for the design, construction and maintenance related to:

1. structural elements and structural strength of the hull and where necessary the watertight integrity of all essential parts of hull and its appendages;
2. safety and reliability of the propulsion and steering system and those features and auxiliary systems for establishing and maintaining basic conditions on board.

In addition to above, the Rules are prescribing requirements related to:

3. stability;
4. subdivision;
5. fire protection.
1.2.3 Compliance with the class related requirements as stated in the Rules does not relieve the Owner from compliance with any statutory requirement demanded by the Flag Administration / Authorities.

In the case of fittings, appliances, details or general finish of the vessel, not covered by the Rules, but specially demanded by the Owner, the Register does not bear any consequences for possible discrepancy of such demands with Flag Administration / Authorities statutory requirements.

1.3 Adoption of the Rules

1.3.1 The Rules are adopted by the General Committee of the Register on the basis of the decision of the Technical Committees.

1.3.2 If not explicitly stated otherwise, the new Rules, as well as the amendments to existing Rules, shall enter into force, after they have been adopted by the General Committee of the Register, on the date indicated on the inside page of the Rules or the in the relevant Chapter of the Rules.

As a general rule, the Rules are printed in English. Notwithstanding before stated, in cases of dispute, and when the Rules are exceptionally printed both in English and Croatian, English version should have precedence and should be taken as the relevant one, while the Croatian version should be considered as a translation only.

1.4 Application of the Rules

1.4.1 The applicable Rules for assignment of class to a newbuilding are those being in force at the date of contract for construction, as specified in the “Request for survey during construction” (definition of date of “contract for construction” see 1.7.11).

Above stated is also applicable to existing vessels when undergoing major conversions, or to the altered part of the vessel in the case of partial alterations.

1.4.2 For vessels in service (existing vessels) requirements of the Rules related to class assignment, maintenance and withdrawal of class are applicable from the date of their entry into force and are determined by the assigned characters of class.

1.5 Interpretation of the Rules

1.5.1 Competent interpretations of the requirements stated in the Rules, or in any other regulation published by the Register, are exclusively in jurisdiction of the Head Office, regardless of other possible interpretations of Surveyors in the Branch offices.

In cases where detailed requirements are not given in the Rules, specific approval by the Register shall be based
on the principles of the Rules, and shall give a safety standard equivalent to that of the Rules.

1.5.2 In general, criteria of the equivalences is applicable for the requirements of the Rules and according to that, any other mode or method of surveys, examinations, calculations or production processes equivalent to those stated in the Rules may be accepted.

Acceptance of the above mentioned criteria is exclusively in jurisdiction of the Head Office and its approval in some cases may be subjected to special conditions.

1.6 Objections against conclusions and interpretations of the Register

Any objections against the line adopted by any official of the Register’s servants in fulfilling their duties or against the conclusions reached shall be raised to the Register by the Interested Party as soon as possible.

If interested parties are not satisfied with final conclusions and interpretations by the Register the final arbitration lays upon the Commission for appeals for the classification and statutory certification, which shall be formed according to the regulation 39 of the Charter of the Register.

1.7 Definitions

1.7.1 Additional requirements - requirements not provided for by the Rules, but imposed by the Register during the survey.

1.7.2 Flag Administration / Authorities - the Administration of the Government of the State whose flag the vessel is entitled to fly.

1.7.3 ADN - European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.

1.7.4 At the discretion of the Surveyor - expresses that the opinion of the Surveyor responsible for the survey or testing shall be considered competent.

1.7.5 Certificate of class - certificate which proves compliance with the requirements of the Rules. In the Certificate of class all characters of classification assigned by the Register are stated, including descriptive notes and service restrictions, if any.

1.7.6 Classification - in general it comprises all the activities and services rendered by the Register in accordance with the Rules.

Classification of vessels is conducted in accordance with the Rules and any other standards to which reference therein may be made.

1.7.7 Class term – period of validity of the Certificate of class (period of class) and normally not being longer than 5 (five) years (see 3.7).

1.7.8 Condition of class - is a requirement to the effect that specific measures, repairs, surveys, etc. shall be carried out within a specific time limit in order to retain class.

1.7.9 Date of build

1. For newbuilding - the year and month at which the newbuilding survey process is completed shall be specified as the “Date of Build”. Where there is substantial delay between completion of construction survey process and the vessel commencing active service, the date of commissioning may be also specified;

2. after modifications - after modifications are completed, the “Date of Build” shall remain assigned to the vessel. Where a complete replacement, or addition of a major portion of the vessel (e.g. a major portion of the vessel may include a complete forward or after section, a complete main cargo section which may include a complete hold/tank of a cargo vessel, a structural modification of a single hull to a double hull vessel) is involved, the following shall apply:

- the “Date of Build” associated with each major portion of the vessel shall be indicated on the Certificate of class, where it has been agreed that the newer structure shall be on a different survey cycle;

- survey requirements shall be based on the “Date of Build” associated with each major portion of the vessel;

- survey due dates may be aligned at the discretion of the Register.

1.7.10 Date of classification

1. For newbuilding - as a general rule, for newbuilding the date of initial classification coincides with the date of build;

2. for existing vessel - as a general rule, for existing vessels or for vessels which were not previously classed with the recognised Classification Society, the date of classification is the date of completion of the Initial class entry survey (admission to class survey) and the assigned Class term will be counted from the date of completion of Initial class entry survey and consequent first issuing if the Certificate of class by the Register.

Notwithstanding above stated, if a vessel was previously classed with the recognized Classification Society, the assigned Class term is never to go beyond the due date of the Renewal survey assigned by the losing society. However, this does not apply to ships with expired or extended certificate of class.

1.7.11 Date of contract for construction

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

2. the date of “contract for construction” of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective Owner and the Shipyard;

3. for the purpose of the Rules, vessels built under a single "contract for construction" are considered a "series of
Chapter I - PRINCIPLES OF CLASSIFICATION

Chapter 1 - Classification and Surveys

1.7.12 Head Office - the Head Office of the Register, or department designated by the Head Office and being in charge for the classification and statutory certification of inland waterway vessels.

1.7.13 Inland navigation - covers operation of vessels on inland waterways, including, rivers, lakes, river mouths and river canals.

NOTE: Inland navigation vessels may operate in coastwise restricted maritime stretches of water complying with the range of navigation specified in 3.5.1 where permitted by the Flag Administration / Authorities. Possible specific requirements of national Flag Administration / Authorities for operation in maritime stretches shall be complied with and take precedence on the present Rules in the case of conflict.

1.7.14 Inland navigation vessel - intended solely or mainly for navigation on inland waterways, as defined in Art. 2 and 3 of the Directive (EU) 2016/1629.

1.7.15 Modification or conversion - modification or conversion of the existing vessel comprises one or more of the following activities:

.1 which substantially alters the dimensions of the vessel;
.2 which substantially alters carrying capacity of the vessel;
.3 which changes the type of the vessel;
.4 the intent of which is substantially to prolong life of the vessel;
.5 which otherwise so alters the vessel that it becomes reasonable to apply requirements as if it were a new vessel;
.6 which changes the navigation area of the vessel;
.7 which changes the maximum permissible number of passengers on the passenger vessel.

Repair or substitution of the elements (components) of the vessel with the identical elements (components) shall not be considered as a modification.

1.7.16 Product - machinery, arrangement, equipment, devices, outfit, as well as their parts and materials to which the requirements of the Rules are applicable while manufacturing.

1.7.17 Recognised Classification Society - Classification Society recognised under provisions of Directive 2006/87/EC, 2016/1629/EU, ADN or other applicable regulations.

1.7.18 Significant wave height - the average of the highest one-third (1/3) of waves (measured from trough to crest), observed over a specific period.

1.7.19 Sister vessels - vessels built to the same reviewed/approved plans for classification purposes. Sister vessels may have minor design alterations provided such alterations do not affect matters related to classification.

1.7.20 Statutory certificates - certificates issued under provisions of national and international statutory instruments (e.g. ES-TRIN, ADN, etc.) issued either by the Flag Administration / Authorities or on its behalf.

1.7.21 Surveyor - a technical staff member acting on behalf of the Register to perform tasks in relation to the services rendered by the Register in accordance with the Rules.

1.7.22 The Owner - party having requested classification or having assumed ownership of a classed vessel. In cases where owners have authorised another party to operate the vessel on their behalf, such party is regarded as the Management Company.

1.7.23 To the satisfaction of the Flag Administration / Authorities - as in various documents such interpretations are vaguely worded, the Register shall, when acting on behalf of the Flag Administration / Authorities, follow guidance issued by national and international statutory instruments unless the Flag Administration / Authorities have instructed otherwise.

1.7.24 To the satisfaction of the Register - expresses the state that corresponds to the requirements of the Rules or additional requirements imposed by the Register.
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2.2.5 In general, Classification Survey is performed by the Surveyors of the Register.

2.2.6 No certificates, statements or attestations with regard to compliance of technical facts or products with the Rules of the Register shall be given or issued by any entity other than the Register.

Statement or attestation given or certificate issued by the Register shall not release the shipyard, Owner, manufacturer, etc. from his contractual obligations towards third parties.

2.2.7 After completing the survey during construction or conversion, or after completing any survey of materials or products, no alteration on the vessel construction, machinery installation, equipment or other parts, to which the requirements of the Rules are applicable, shall be carried out without permission of the Register.

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

2.2.9 Classification Surveys are not performed as a substitute for the Owner's or any other party's own quality and safety control of the vessel, or their obligations to third parties, nor to relieve them of any responsibilities for not maintaining the vessel in good and sail worthy manner.

2.2.10 The Owner shall ensure that the condition of the vessel and maintenance of its equipment is such that the vessel is in any case capable for navigation with no hazards for the vessel, personnel, passengers, cargo-owners, underwriters, Flag State Administrations, Port State Authorities, designers, shipbuilders, manufacturers, repair yards or suppliers.

2.2.11 Classification Survey of existing vessel is performed on the basis of a request submitted by the Owner or party authorized in such capacity by the Owner.

For Classification Surveys of newbuilding refer to the present Rules, Chapter II, Section 3.

For Classification Surveys at the occasion of Initial class entry survey refer to the present Rules, Chapter II, Section 4.

2.2.12 It is the responsibility of the Owner to ascertain the presence of his representative while surveys of existing ships are performed.

2.2.13 While performing surveys of existing vessels, i.e. during surveys of the parts or systems of the vessel, the
Chapter I - PRINCIPLES OF CLASSIFICATION

2.3 Obligations of the Owner

2.3.1 The Owner or his authorized representative shall notify the Register in the following cases:

.1 when docking a vessel;

.2 in cases of changing the purpose of a vessel, modification, conversion and alternation to the hull, machinery installations and other equipment influencing the class of the vessel assigned by the Register. Conversions and alternations shall be performed under the Surveyor's supervision, and shall be in accordance with the requirements of the Rules and/or additional requirements of the Register. This also includes cases of major repairs affecting classification;

.3 in cases when parts of the vessel’s structure normally difficult to access are exposed, (e.g. when any part of the main or auxiliary machinery, including boilers, insulation cement or wooden ceilings, etc. is removed). These activities shall be in accordance with the requirements of the Rules and/or additional requirements of the Register and under the Surveyor's supervision;

.4 when the vessel is put out of service or when the vessel is laid-up or when vessel is scrapped;

.5 in cases of changing the name, changing the port of registry, changing the flag or selling the vessel;

.6 in cases when the vessel sustains damage of such extent that it is presumed that vessel’s class is affected and that safety and integrity of the vessel is endangered;

.7 in cases when class related deficiencies and/or defects are found as a result to Flag Administration / Authorities or Port State Authorities. Should the Owner fails to inform the Register on detention of the vessel by State Authorities due to class related deficiencies, the Register reserves the right to suspend or withdraw Certificate of class.

2.4 Confidentiality and disclosure of information

2.4.1 The Register keeps complete files on all vessels classed by the Register.

The Register maintains confidentiality with respect to all documents and other kinds of information received in connection with the classification entrusted to it by the client.

2.4.2 The Register is obliged not to dispose documents or any other information concerning vessel's classification to third parties without prior consent of the client. However, this shall not apply to:

.1 the obligations the Register has towards the Flag Administration / Authorities;

.2 the obligations the Register has towards legal requirements and international conventions;

.3 technical data of vessels contained in the Register Book;

.4 status of vessel surveys and certificates;

.5 the obligations the Register has towards the European Commission or other competent authorities.

Before mentioned, as far as applicable, applies to files related to approval of manufacturers, products, service suppliers or testing laboratories also.

2.4.3 The service of the Register is available to the Owner at any time when needed, in connection with reports on previously performed surveys, or commencing surveys, as well as with conditions for the classification.

2.4.4 After every performed survey the Register will make available to the Owner a Survey Report concerning conditions of class and related time limit for undertaking necessary repairs, improvements or other measures, i.e. time limit for adjusting the vessel, equipment, machinery installations or other relevant arrangements and systems with the requirements of the Rules.

2.5 Application of statutory requirements

2.5.1 When authorised by the Flag Administration / Authorities concerned, the Register will act on its behalf within the limits of such authorisation. In this respect, the Register will take into account the relevant international and the relevant national requirements, survey the vessel and issue or contribute to issue of the corresponding certificates.

2.5.2 The above surveys do not fall within the scope of the classification of vessels, even though their scope may overlap in part and may be carried out concurrently with surveys for assignment or maintenance of class.

2.5.3 Attention is drawn to the necessity to comply with these applicable national and international statutory instruments which may also contain requirements which are outside of classification as defined in these Rules, such as European Directives, the Regulations of the Central Commission for the Navigation of the Rhine (CCNR) and the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN).

Consequently, statutory requirements regarding vessel construction, such as ADN, may be applied upon agreement with the relevant Flag Administration / Authorities and the Register.

2.5.4 In the case of a discrepancy between the provisions of the applicable international and national statutory instruments and those of the Rules, normally, the former shall take precedence.

2.6 Spare parts

2.6.1 It is the Owner’s responsibility to decide whether and which spare parts will be carried on board. As spare parts are outside the scope of the classification, they will not be checked during Classification Surveys that they are kept on board, maintained in satisfactory condition, or suitably protected and lashed. However, in the case of replacement, the spare parts used shall meet the requirements of the Rules as far as practicable.
2.7 External audits / inspections

2.7.1 In cases of external audits or inspections of processes of the Register, for the certification of the Register and in order to verify compliance of such processes against applicable rules, and as required by internal Quality System, regulations and quality standards, the following parties shall have free access at any stage of classification:

1. authorised representatives of the Flag Administration / Authorities;
2. authorised audit teams (e.g. Accreditation Body or EU Commission or other auditors).

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

2.8 Issuing of the Certificate of class

2.8.1 After completion of the survey during construction, and when the attending Surveyor is of the opinion that all the requirements for the class assignment have been met, the Provisional / Interim Certificate of class shall be issued.

The Provisional / Interim Certificate of class has 3 (three) months validity, i.e. until survey reports and vessel’s class are verified by the Head Office by issuing of full term Certificate of class.

2.8.2 Survey during construction may be considered complete with some minor items unverified, provided that such items are stated as the Conditions of class / recommendation, including related time limits for their rectification. At the same time the attending Surveyor will document the completion of the survey during construction by issuing the Interim Certificate of class and sending conditions of class to the Head Office of the Register.

2.8.3 In case of admission to class of an existing vessel which has not been built under survey of the Register, or in the case of re-admission to class of an existing vessel, the Certificate of class will be issued after the satisfactory completion of the Initial class entry survey, and when the attending Surveyor is of the opinion that all the requirements for the class assignment, or transfer of class have been met.

2.8.4 The class will be assigned to a vessel and a full term validity Certificate of class will be issued to a vessel after examination of the Surveyor’s reports and records, and verification that the requirements of the Rules corresponding to the class have been met.

2.8.5 The Head Office may not issue the Certificate of class if it is presumed that all requirements of the Rules have not been fulfilled, even if the Provisional / Interim Certificate of class has been previously issued.

2.8.6 The Register reserves the right to add special descriptive notation in the Certificate of class, as well as any other information or restrictions having influence on the vessel operation relevant for the classification.

2.9 Maintenance the validity of the Certificate of class

2.9.1 It is the responsibility of the Owner to ensure that all surveys necessary for the maintenance of class are carried out at proper time in accordance with the Rules.

2.9.2 Validity of the Certificate of class is determined with class term with a condition that regular class related surveys shall be carried out in specified intervals as prescribed in the present Rules, Chapter III - Surveys and shall be completed to the satisfaction of Register.

2.9.3 After completion of Initial class entry survey or Class Renewal Survey to the satisfaction of the Register, the Register will issue the Certificate of class.

2.9.4 After completion of Intermediate or other periodical class related survey, to the satisfaction of the Register, the Certificate of class will be endorsed accordingly.

2.9.5 The Register may, in cases of serious deficiencies, suspend or withdraw existing vessel’s Certificate of class and replace it with new certificate having reduced period of validity, during which such deficiencies shall be dealt with.

In cases when deficiencies are of such extent that it is presumed that vessel’s class, it’s safety and integrity, safety of the crew, passengers, or environment is endangered, the Register shall suspend or withdraw vessel’s Certificate of class and shall require the vessel to be surveyed in the first port of call where necessary repairs shall be carried out.

2.9.6 As a rule, in the case of change the ownership the vessel retains its class, provided that the Register is duly informed on such change and that the new Owner requests to keep the current class.

2.10 Use of service suppliers and measuring equipment

2.10.1 For the requirements related to use of service suppliers and measuring equipment at the occasion of class surveys refer to applicable Parts of the Rules for the classification of ships of the Register.

2.11 Extension of the validity

2.11.1 Under exceptional circumstances (for definition see the present Rules, Chapter III, 1.2.10) the Register may grant an extension not exceeding 3 (three) months to allow for completion of the Class Renewal Survey provided that the vessel is attended and that attending Surveyor(s) so recommends after the following has been carried out:

1. re-examination of Condition of class;
2. progression of the class Renewal survey as far as practicable.

2.12 Operating condition of the vessel

2.12.1 The vessel, machinery installations and related essential arrangements and systems shall be adequately manned and competently handled and maintained at a standard complying with the requirements of the Rules.
2.12.2 The vessel shall be loaded and operated in proper manner by competent and qualified crew or operating personnel taking into respect consideration distribution of cargo and ballast, if necessary where applicable to the securing of cargo, as well as to the operation of vessel in heavy weather, including any limitation or restriction imposed by the Register.

In particular, it will be assumed that the draught of the vessel in operating conditions will not exceed that corresponding to the freeboard assigned or the maximum approved for the classification, that the vessel will be properly loaded taking into account both its stability and the stresses imposed on its structures and that cargoes will be properly stowed and suitably secured and that the speed and course of the vessel are adapted to the prevailing wave height and weather conditions.

2.12.3 Damages

2.12.3.1 The Owner or his authorized representative shall notify the Register in the cases when the vessel sustains damage (see 2.3).

2.12.3.2 Any damage or excessive wastage of the vessel’s structure (i.e. shell frames and their end attachments, shell plating, deck structure, deck plating, bottom structure, bottom plating, watertight bulkheads, oil-tight bulkheads, hatch coamings and hatch covers) beyond permissible limits affecting vessel’s class shall be immediately and permanently repaired after the survey.

2.12.4 For locations where adequate repair facilities are not available, consideration may be given to permit the vessel to proceed directly to repair yard. For such intended voyage discharging of the cargo and/or immediate temporary repairs may be required.

2.12.4.1 If concluded by the Register that such damage or wastage is not immediately affecting vessel’s class, its safety and integrity, safety of the crew, passengers, or environment, the vessel may be permitted to be temporarily repaired for a period to be defined, which as a result may have issuing of a new Certificate of class with a reduced period of validity, and/or imposing of appropriate conditions of class.

2.12.5 Repairs, modifications, conversions and alterations

2.12.5.1 Repairs on the vessel's hull, machinery as well as special equipment and installations affecting classification shall be carried out under the supervision of the Register. In such cases the Register shall be notified by the Owner or his authorized representative including foreseen repair measures.

2.12.5.2 The Owner or his authorized representative shall notify the Register in cases modifications, conversions and alterations (see 2.3).

For relevant requirements, refer to the present Rules, Chapter II, Section 3.

2.12.6 Documentation to be kept on board

Certificate of class as well as other documents issued by the Register and any other documentation of significance for the classification, such as (if applicable and if required):

.1 Certificate of class;

.2 survey statements and survey reports;

.3 maintenance schedules;

.4 stability booklet and loading manual;

.5 description of corrosion protection system;

.6 list of important testing and/or monitoring procedures related to the class and other documentation,

shall be kept on board vessel and should be readily available to the Surveyor on request.

2.13 Register book

When the class has been assigned to a vessel, its main particulars and class notations will be entered in the Register Book of inland navigation vessels of the Register. Other than that, details related to the vessel's hull and machinery installation are also entered in the Register Book indicating vessel's particulars, it's deadweight, construction material, main and auxiliary machinery power output, etc.

Register Book is published periodically by the Register. Data contained in the Register Book are regularly updated and are available on-line for public at large on the official web site of the Register also.
3 CLASS NOTATIONS

3.1 General provisions

3.1.1 The Register will assign appropriate class notation to the vessel which meets the requirements of the Rules.

3.1.2 Class notation consists of main and additional characters of class, which are denoting the degree of reliability that vessel deserves as well as vessel’s main particulars.

Class notation assigned to a vessel shall be indicated in the Certificate of class.

3.1.3 Apart from class notation the Register reserves the right to add special descriptive note(s) and which shall be indicated in the Certificate of class, as stated but not limited to ones in this Section.

Descriptive note provides descriptive information regarding vessel type in greater detail, special design assumptions, arrangements or equipment, which are not covered by main class or additional characters of class.

Descriptive note shall not be considered as a class notation, but as additional information only, and consequently in general is not subjected to provisions related to maintenance of class.

3.2 Class Notations

3.2.1 The Register can assign class notation for the following:

1 Hull.
2 Machinery installation.

3.2.2 Class notation for the hull comprises:

1 Main Character of class, comprising:
   a) character denoting survey during construction,
   b) character denoting quality of hull.
2 Additional Character of class, comprising as far as applicable:
   a) character denoting navigation area,
   b) character denoting hull equipment,
   c) character denoting type of the vessel,
   d) other various additional Characters of class.

3.2.3 Class notation for machinery installation comprises:

1 Main Character of class, comprising:
   a) character denoting survey during construction,
   b) character denoting quality of machinery installation,
   c) other various additional Characters of class.

3.2.4 Example of the class notation:

HULL: ★100A1 IWW-2 AC Tanker / DP = 10kPa / TP=13kPa Type N closed / ADN / Ice
MACHINERY INSTALLATION: ★M1

3.3 Main character of class for hull

3.3.1 Main character of class for hull denoting survey during construction and when after construction is maintained in a condition considered satisfactory by the Register.

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One of the following characters:

★ - shall be assigned to a vessel if the hull has been built under survey and to the satisfaction of the Register in accordance with the Rules;

◆ - the hull has been built under survey and in compliance with the rules and to the satisfaction of another recognized Classification Society;

[No symbol] - if the hull has been built without survey of the Register or any recognized Classification Society no symbol is assigned.

3.3.2 Main character of class denoting quality of hull.

One of the following characters shall be assigned:

100A1 - shall be assigned to a vessel which fully complies with requirements of the Rules.
100A2 - shall be assigned to a vessel whose construction due to general condition found by survey does not fully comply with requirements of the Rules.

3.4 Main character of class for machinery installation

3.4.1 Main character of class for machinery installation denoting survey during construction and when after construction is maintained in a condition considered satisfactory by the Register.

One of the following characters:

★ - is assigned to a vessel if the machinery installation has been built under survey and to the satisfaction of the Register in accordance with the Rules.
◆ - the machinery installation has been built under survey, in compliance with the rules and to the satisfaction of another recognized Classification Society.

[No symbol] - the machinery installation has been built without survey of the Register or any other recognized Classification Society.

4.4.2 Main character of class denoting quality of machinery installation. One of the following characters shall be assigned:

M1 - this character of class shall be assigned to a vessel if main propelling and essential auxiliary engines are fully complying with requirements of the Rules.
M2 - this character of class shall be assigned to a vessel if main propelling and essential auxiliary engines are not fully complying with requirements of the Rules.

[No symbol] - character of class may be assigned to existing vessel at the occasion of initial class entry in cases other than above and when the following is fulfilled:

M1 .1 when the propelling and essential auxiliary machinery engines have not been manufactured under the supervision of the Register;
 .2 when the propelling and essential auxiliary machinery engines have not been manufactured under the supervision of the recognized Classification Society;

under presumption that during the survey a thorough examination of existing machinery installation has been carried out with satisfactory result.
EXP - this character of class shall be assigned to a vessel whose machinery installation is constructed in accordance with design, for which sufficient experience is not available. The Register will decide at what intervals the required surveys will have to be carried out. If the experience over a prolonged period of time has proved the efficiency of design the character EXP may be cancelled.

### 3.5 Additional characters of class - Hull

#### 3.5.1 Navigation area

3.5.1.1 Character of class IWW denotes area of permissible navigation of the vessel on waters covered by these Rules. Inland navigation waters cover:
- all inland waterways;
- all restricted maritime stretches of water up to significant wave height of 2,0 m;
- other waters showing comparable conditions.

The character IWW is completed with the range of navigation based on significant wave height for which the vessel has been calculated.

Observance of the navigation area restrictions if any, is a prerequisite for maintaining the validity of the Certificate of class.

3.5.1.2 With regard to the range of navigation it may be added upon request of the Owner and upon examination of drawings and plans where Register can calculate vessel’s scantlings for any wave height up to 2,0 m, based on provisions of the Rules in order to determine ability of a vessel to operate in specified areas or in specific navigation zones. This ability depends on some other factors not considered by the Rules and correspondingly. Range of navigation assigned by the Register should not be compared to a navigation zone or category as defined by national or international Regulations.

If vessel operates in certain rivers, lakes or waters only, the range of navigation character may be supplemented by indicated river, lake or area of navigation, e.g. Danube or Sava.

Anyhow, the assignment of one of below ranges of navigation does not oblige the Owner from compliance with any international and national Regulations established by the Flag Administration / Authorities for a vessel operating in national waters, or a specific area, or a navigation zone.

.1 The range of navigation IWW-0 is assigned to a vessel having a structure with scantlings deemed suitable to navigate on still and smooth stretches of water.

.2 The range of navigation IWW-0,6 is assigned to a vessel having a structure with scantlings deemed suitable to navigate on stretches of water where there may be strong currents and certain roughness of the surface on which a maximum significant wave height of 0,6 m can develop.

.3 The range of navigation IWW-1,2 is assigned to a vessel having a structure with scantlings deemed suitable to navigate on semi-maritime stretches of water, estuaries or lakes on which a maximum significant wave height of 1,2 m can develop.

.4 The range of navigation IWW-2,0 is assigned to a vessel having a structure with scantlings deemed suitable to navigate on semi-maritime stretches of water, estuaries or lakes on which a maximum significant wave height of 2,0 m can develop.

**NOTE:** Geographical navigation area may be additionally restricted by the river/lake state conditions, which shall be indicated in the Certificate of class. As the some navigation conditions on some rivers, lakes or estuaries are very similar to sea navigation conditions, the Owner must state that the vessel is going to be assigned a range of navigation according to these Rules or one of the navigation notations applicable for sea-going ships.

#### 3.5.2 Hull equipment

3.5.2.1 Character of class AC, indicates that the vessel’s hull equipment on anchors and chain cables comply with applicable requirements of the Rules.

3.5.2.2 Character (AC) indicates that the vessel’s hull equipment does not meet fully the requirements of the Rules, but, however, is deemed acceptable for the intended service.

Reference will be made in the Certificate of class to the compliance of the equipment with other recognized standards or Regulations, such as European Directives or Resolution 61 of UNECE.

3.5.2.3 The Register reserves the right not to assign character of class for hull equipment in cases other than above.

#### 3.5.3 Type of the vessel

3.5.3.1 Character of class denoting type of the vessel specifies the type and its particular features, capabilities, service restrictions or special equipment and installations intended for its classification in accordance with the request for the classification.

The assignment of any character of class to a new vessel is subject to compliance with the general Rule requirements laid down in the Rules, Part 2 – Hull and Hull Equipment, Part 3 – Machinery, Systems and Electricity and Part 4 – Additional Requirements for Notations.

3.5.3.2 At least one character of class denoting type of the vessel shall be assigned to every classed vessel. However, this does not preclude that several different type notations are assigned to a vessel. In such a case, the specific Rule requirements applicable to each type notation shall be complied with.

3.5.3.3 The various type notations which may be assigned to a vessel are listed in alphabetical order in Table 3.5-1. The additional Characters of class to the type notations are listed in Table 3.6-1.
3.5.4 Notations related to the type of vessel

3.5.4.1 Notation **Barge** is applicable for vessels without propulsion intended for the carriage of solid cargo and/or bulk complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, 2.2*, or 2.3, as applicable.

3.5.4.2 Notation **Cargo vessel** is applicable for vessels intended for the carriage of solid cargo and/or bulk complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, 2.2*, or 2.3, as applicable.

3.5.4.3 Notation **Dredger** is applicable to vessels specially equipped for dredging activities (excluding carrying dredging material) complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 7.*

This type notation may be completed by the type of the dredger, e.g. **Suction dredger** or **Cutter dredger**.

3.5.4.4 Notation **Hopper barge** is applicable to vessels specially equipped for carrying spoils or dredged material only, complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 7.*

3.5.4.5 Notation **Hopper dredger** is applicable to vessels specially equipped for dredging activities and carrying spoils and dredged material, complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 7.*

3.5.4.6 Notation **Passenger vessel** is applicable to vessels specially intended to carry more than 12 passengers complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 4.*

This notation may be accompanied by the type of passenger vessel (i.e. HSC, ro-ro pax/ferry, cabin vessel, daily cruises vessel, etc.)

3.5.4.7 Notation **Pontoon** is applicable to units without propulsion intended to carry cargo and/or equipment on deck only, complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 6.*

If is unit equipped with a permanently fitted crane, specifically arranged and intended for lifting of heavy cargoes, the crane shall be certified and the type and service.

Notation **Pontoon** may be accompanied by the type of installations on deck of the pontoon, e.g. **Pontoon / Crane**.

3.5.4.8 Notation **Pushed barge** is applicable to vessels without propulsion as a part of a pushed convoy or a side-by-side formation intended for the carriage of solid cargo and/or bulk complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, 2.2, or 2.3*, as applicable.

3.5.4.9 Notation **Pusher** is applicable to vessels specially equipped for pushing, complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 5.*

3.5.4.10 Notation **Special type** is applicable to vessels which are not covered by any of the type mentioned above. Requirements of such units are considered by the *Register* on the case by case basis.

3.5.4.11 Notation **Suction hopper barge** is applicable to vessels specially equipped for carrying spoils or dredged material only, and which open longitudinally around hinges complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 7.*

The list of cargoes the tanker is permitted to carry will be issued by the *Register*, in the case of transport of dangerous goods as stated in *Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 1.*

3.5.4.12 Notation **Tanker** is applicable for vessels specially intended for the carriage of liquid or gaseous cargo in bulk complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 3* (see also 3.7 for tanker types).

The list of cargoes the tanker is permitted to carry will be issued by the *Register*, in the case of transport of dangerous goods as stated in *Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 1.*

3.5.4.13 Notation **Tug** is applicable for vessels specially equipped for towing, complying with the *Rules, Part 4 – Additional Requirements for Notations, Chapter I, Section 5.*

3.6 Additional Characters of class

3.6.1 The following additional Characters of class are applicable for cargo vessels, barges and pushed barges:

3.6.1.1 **DDG** – type notation **Cargo vessel** may be accompanied with the additional Character of class **DDG** when the cargo vessel is designed for carriage of dry dangerous goods in accordance with the requirements stated in the *Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 2.*

3.6.1.2 **GRAB** – type notation **Cargo vessel** may be accompanied with the additional Character of class **GRAB** when the structural members of inner bottom, sides and bulkheads within vessel’s cargo hold are appropriately reinforced for loading/unloading cargoes by means of grabs or buckets.

The requirements for the assignment of this Character of class are given in the *Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 2.*

This Character of class may only be assigned to vessels with the type notation **Cargo vessel**.

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Table 3.5-1

<table>
<thead>
<tr>
<th>Type notation</th>
<th>Reference</th>
<th>Applicable requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barge</td>
<td>3.5.4.1</td>
<td>Part 4, Ch. I, 2.2, or 2.3, as applicable</td>
</tr>
<tr>
<td>Cargo vessel</td>
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<td>Part 4, Ch. I, 2.2, or 2.3, as applicable</td>
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<tr>
<td>Dredger</td>
<td>3.5.4.3</td>
<td>Part 4, Ch. 1, Sec 7</td>
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<tr>
<td>Hopper barge</td>
<td>3.5.4.4</td>
<td>Part 4, Ch. 1, Sec 7</td>
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<tr>
<td>Hopper dredger</td>
<td>3.5.4.5</td>
<td>Part 4, Ch. 1, Sec 7</td>
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<td>Part 4, Ch. 1, Sec 4</td>
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<td>Pontoon</td>
<td>3.5.4.7</td>
<td>Part 4, Ch. 1, Sec 6</td>
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<td>Pushed barge</td>
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<td>Part 4, Ch. 1, 2.2, or 2.3, as applicable</td>
</tr>
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<td>Pusher</td>
<td>3.5.4.9</td>
<td>Part 4, Ch. 1, Sec 5</td>
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<tr>
<td>Special type</td>
<td>3.5.4.10</td>
<td>-</td>
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<tr>
<td>Split hopper barge</td>
<td>3.5.4.11</td>
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<td>3.5.4.12</td>
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<td>Tug</td>
<td>3.5.4.13</td>
<td>Part 4, Ch. 1, Sec 5</td>
</tr>
</tbody>
</table>
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3.6.1.3 HVCG (AREAi, Xi [kN/m²]) – type notation

Cargo vessel may be accompanied with the additional Character of class HVCG (AREAi, Xi [kN/m²]) when the vessel’s double bottom and/or hatch covers and/or other cargo areas are designed to withstand heavy cargoes fulfilling applicable requirements of the Rules.

The value Xi indicates the maximum permissible local pressure corresponding to zone AREAi, where the cargo is intended to be stowed, e.g.: Cargo vessel / HVCG (Cargo Holdi, 100 kN/m²).

The requirements for the assignment of this additional Character of class are given in the Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 3.

3.6.1.4 HVCG – type notation

Cargo vessel may be accompanied with the additional Character of class HVCG when the vessel is permitted to carry cargo with maximum density greater than or equal to 2.5 t/m³ indicating the maximum permissible density of cargo when vessel’s double bottom structure complies with the requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 3, e.g.: Cargo vessel / HVCG / Max. density 3.5 t/m³.

3.6.2 The following additional Characters of class are applicable for vessels carrying liquids or gaseous cargo in bulk:

3.6.2.1 TP/DP – test pressure TP and design pressure DP of the cargo tank, measured at the tank top, expansion trunk or dome excluded and expressed in kPa, are added as an additional Character of class. These pressures shall be determined according to the Rules, Part 2 – Hull and Hull Equipment, Chapter III, 5.8 and 5.1 for test pressure and design pressure respectively, taking z equal to zTOP.

3.6.2.2 Type G – additional Character of class Type G is applicable to a tanker built and equipped for the carriage in bulk of gases under pressure or under refrigeration, either in accordance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Sections 1 and 3 or with ADN Regulations for this type of vessel. Character of class Type G will be accompanied with the additional Character of class ADN.

Items not covered by the ADN provisions shall comply with applicable requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter II – Transport of dangerous goods.

Table 3.6-1

List of additional Characters of class

<table>
<thead>
<tr>
<th>Cargo vessels</th>
<th>Reference</th>
<th>Applicable requirements</th>
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</thead>
<tbody>
<tr>
<td>DDG</td>
<td>3.6.1.1</td>
<td>the Rules, Part 4, Chapter II, Section 2</td>
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<td>GRAB</td>
<td>3.6.1.2</td>
<td>the Rules, Part 4, Chapter III, Section 2</td>
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<tr>
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<td>3.6.1.3</td>
<td>the Rules, Part 4, Chapter III, Section 3</td>
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<table>
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<tr>
<th>Vessels carrying liquid or gaseous cargo in bulk</th>
<th>Reference</th>
<th>Applicable requirements</th>
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<tr>
<td>TP/DP</td>
<td>3.6.2.1</td>
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<tr>
<td>Type G</td>
<td>3.6.2.2</td>
<td>the Rules, Part 4, Chapter II, Sections 1 and 4</td>
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<tr>
<td>Type C</td>
<td>3.6.2.3</td>
<td>the Rules, Part 4, Chapter II, Sections 1 and 4</td>
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<td>Type N closed</td>
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<td>Type N open with flame arresters</td>
<td>3.6.2.5</td>
<td>the Rules, Part 4, Chapter II, Sections 1 and 5</td>
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<tr>
<td>Type N open</td>
<td>3.6.2.6</td>
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<tr>
<td>Oil separator vessel</td>
<td>3.6.2.7</td>
<td>the Rules, Part 4, Chapter II, Sections 1, 6 and 7</td>
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<td>Supply vessel</td>
<td>3.6.2.8</td>
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</table>

<table>
<thead>
<tr>
<th>Other additional Characters of class</th>
<th>Reference</th>
<th>Applicable requirements</th>
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<tr>
<td>Intact stability</td>
<td>3.6.3.1</td>
<td>the Rules, Part 4, Chapter III, Section 4</td>
</tr>
<tr>
<td>Damage stability</td>
<td>3.6.3.2</td>
<td></td>
</tr>
<tr>
<td>ADN</td>
<td>3.6.3.3</td>
<td>ADN, Part 4, Chapter II</td>
</tr>
<tr>
<td>Ice</td>
<td>3.6.3.4</td>
<td>the Rules, Part 4, Chapter III, Section 2</td>
</tr>
</tbody>
</table>
### Additional Requirements for Notations

#### 3.6.2.3 Type C – additional Character of class Type C is applicable to a tanker built and equipped for the carriage of dangerous liquids in bulk, either in accordance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Sections 1 and 4 or with ADN Regulations for this type of vessel. Character of class Type C will be accompanied with the additional Character of class ADN.

Items not covered by ADN provisions shall comply with applicable requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter II – Transport of dangerous goods.

#### 3.6.2.4 Type N closed – additional Character of class Type N closed is applicable to a tanker built and equipped for the carriage of dangerous liquids in bulk, either in accordance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Sections 1 and 5 or with ADN Regulations for this type of vessel. Character of class Type N closed will be accompanied with the additional Characters of class ADN.

Items not covered by the ADN provisions shall comply with applicable requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter II – Transport of dangerous goods.

#### 3.6.2.5 Type N open with flame arresters – additional Character of class Type N open with flame arresters is applicable to a tanker built and equipped for the carriage of dangerous liquids in bulk, either in accordance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Sections 1 and 5 or with ADN Regulations for this type of vessel. Character of class Type N open with flame arresters will be accompanied with the additional Character of class ADN.

Items not covered by the ADN provisions shall comply with applicable requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter II – Transport of dangerous goods.

#### 3.6.2.6 Type N open – additional Character of class Type N open is applicable to a tanker built and equipped for the carriage of dangerous liquids in bulk, either in accordance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Sections 1 and 5 or with ADN Regulations for this type of vessel. Character of class Type N open will be accompanied with the additional Character of class ADN.

Items not covered by the ADN provisions shall comply with applicable requirements of the Rules, Part 4 – Additional Requirements for Notations, Chapter II – Transport of dangerous goods.

#### 3.6.2.7 Oil separator vessel – additional Character of class Oil separator vessel is applicable to a Type N open tanker with a deadweight of up to 300,0 tonnes, built and equipped to accept and carry oily and greasy wastes from other vessels, which are in compliance either with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 6 or with ADN Regulations for Type N open tanker.

### Supply vessel – additional Character of class

Supply vessel is applicable to a Type N open tanker with a deadweight of up to 300,0 tonnes, built and equipped to carry and deliver to other vessels of products intended for the operation of vessels, which are in compliance with the applicable requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 7 or with ADN Regulations for Type N open tanker.

#### 3.6.3 Other additional Characters of class

#### 3.6.3.1 Intact stability – additional Character of class

Intact stability may be assigned to a vessel for which an intact stability calculation has been examined by the Register and found in compliance with applicable Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 4.

The criteria considered for this examination has to be specified and has to be annexed to the Certificate of class. The approved intact stability file shall be kept on board.

#### 3.6.3.2 Damage stability – additional Character of class

Damage stability may be assigned to a vessel for which an intact and damage stability calculation has been examined by the Register and found in compliance with applicable Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 4.

The criteria considered for this examination has to be specified and has to be annexed to the Certificate of class. The approved damage buoyancy and stability file shall be kept on board.

#### 3.6.3.3 ADN – additional Character of class ADN should be assigned if the vessel’s structure, stability and equipment are in compliance with the Regulations Annexed to the European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways, as amended. Assigned Character of class ADN is, in no way, intended to replace statutory certificate.

#### 3.6.3.4 Ice – if vessel’s hull structure, machinery and other properties are designed in compliance with the Rules requirements for navigation in drift ice, as stated in the Rules, Part 4 – Additional Requirements for Notations, Chapter III, Section 2, additional Character of class Ice should be assigned.

### Descriptive notes

#### 3.7.1 Class term

As a general rule, nominal Class term has five (5) year duration. However, three (3) year Class term is assigned to vessel it should be indicated in the Certificate of class as a descriptive note, as follows:

“The vessel is assigned with three years Class term”

#### 3.7.2 The nominal Class term may be extended in compliance with the present Rules, Chapter III, 1.3.

In exceptional cases the Class term may be additionally reduced and for a limited time, if the vessel does not fully comply with the Rules but has been permitted to operate under restrictions.
3.7.2 Building material

3.7.2.1 In the case that materials other than normal strength steel have been used for hull construction the following descriptive notes should be entered in the Certificate of class:

.1 in the case that hull structure is partly built of HTS:
“Hull structure partly built of high tensile steel”

.2 in the case that hull structure is built of aluminium:
“Hull structure built of aluminium”

.3 in the case that hull structure is built of composite materials (e.g. FRP):
“Hull structure built of composite material”

.4 in the case that hull structure is built of wood:
“Hull structure built of wood”

3.7.3 Type of construction

3.7.3.1 Depending of the type of construction of the hull the following descriptive note should be entered in the Certificate of class:

.1 for vessels and units built with a single hull structure in accordance with the applicable Rule requirements (Rules, Part 2, Chapter V, Sections 2 and 3):
“Single hull vessel”

.2 for vessels and units completely built with a double hull structure in accordance with the applicable Rule requirements (Rules, Part 2, Chapter V, Sections 2 and 3):
“Double hull vessel”

.3 for single hull vessels and units built with a double bottom in accordance with the applicable Rule requirements (Rules, Part 2, Chapter V, Section 2):
“Double bottom vessel”

.4 for single hull vessels and units built with a double sides only in accordance with applicable Rule requirements (Rules, Part 2, Chapter V, Section 3):
“Double side vessel”

3.7.4 Cargo vessels being the part of a pushed convoy

3.7.4.1 For vessels having type notation Cargo vessel, when the vessel (not carrying dangerous goods) is intended to be a part of a pushed convoy or a side-by-side formation comprising a cargo vessel or a tank vessel carrying dangerous substances and complies with the Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 9, the following descriptive note should be entered in the Certificate of class:
“Cargo vessel not carrying dangerous substances - part of pushed convoy carrying dangerous substances”

3.7.5 Tankers being the part of the convoy

3.7.5.1 For vessels having type notation Tanker, when the vessel (not carrying dangerous goods) is intended to be a part of a pushed convoy or a side-by-side formation comprising a cargo vessel or a tanker carrying dangerous substances and complies with the Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 9, the following descriptive note should be entered in the Certificate of class:
“Tanker not carrying dangerous substances - part of pushed convoy carrying dangerous substances”

3.7.6 Non-homogenous loading

3.7.6.1 For vessels having type notation Cargo vessel or Tanker, comprising:

.1 when the Cargo vessel is designed in such a way that cargo holds may be loaded non-homogeneously (in such cases some cargo holds may be empty, at a draught up to the scantling draught fulfilling applicable Rule requirements for general strength, and when the corresponding loading conditions are listed in the reviewed or approved loading manual);

.2 when the Tanker is designed in such a way that cargo tanks may be loaded non-homogeneously (in such cases some holds may be empty, at a draught up to the scantling draught fulfilling applicable Rule requirements for general strength, and when the corresponding loading conditions are listed in the reviewed or approved loading manual),

the following descriptive note should be entered in the Certificate of class:
“Non-homogenous loading”

This may be accompanied with the indication of the different maximum loads permitted in each cargo tank (cargo hold) and which cargo tanks (cargo holds) may be empty, if appropriate (e.g. Holds Nos. 1, 3 and 5 may be empty).

3.7.7 Vessels used for propulsion of a pushed convoy

3.7.7.1 For vessels having type notation Tug, Pusher or Cargo vessel when the tug, pusher or cargo vessel used for propulsion of a pushed convoy or a side-by-side formation comprising:

.1 a tank vessel carrying dangerous substances and complies with the Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 8, or

.2 a cargo vessel carrying dangerous substances and complies with the Rule requirements stated under the Rules, Part 4 – Additional Requirements for Notations, Chapter II, Section 8,

the following descriptive note should be entered in the Certificate of class:
“Tug (Pusher) - part of pushed convoy carrying dangerous substances”, or

“Cargo vessel – used for propulsion of pushed convoy carrying dangerous substances”

3.7.8 Type of propulsion

3.7.8.1 For vessels or units of non-propelled type, the following descriptive note should be entered in the Certificate of class:
“Non-self-propelled vessel or unit”

3.7.9 Navigation in ice

3.7.9.1 The following descriptive note should be entered in the Certificate of class:
“Vessel compliant for navigation in drift ice”
3.7.10 Maximum permitted temperature

3.7.10.1 For vessels where the data on maximum permitted temperature of the cargo to be carried is needed, the following descriptive note should be entered in the Certificate of class:

“Maximum permitted temperature of cargo: xx °C”

3.7.11 Maximum permitted density

3.7.11.1 For vessels where the data on maximum permitted density of the cargo to be carried is needed, the following descriptive note should be entered in the Certificate of class:

“Maximum permitted density of cargo: xx t/m³”

3.7.12 Unattended machinery space

3.7.12.1 For vessels, that according the opinion of the Register are complying with the automation level requiring periodically unattended machinery space, the following descriptive note should be entered in the Certificate of class:

“Vessel is provided with automation level for periodically unattended machinery space”

3.7.13 Annual survey

3.7.13.1 For vessels for which the conducting of the Annual surveys for the purpose of maintenance of class have been agreed, the Annual survey should performed in compliance with the present Rules, Chapter III, Section 2, with the following descriptive note entered in the Certificate of class:

“Vessel subjected to Annual class surveys”
II CLASSIFICATION

1 ASSIGNMENT OF CLASS

1.1 General

Class is assigned to a vessel upon a completion of Classification Surveys. These surveys may be:

.1 survey during construction - vessels classed under construction of the Register;
.2 survey where the vessel changes its class from some other recognised Classification Society to the Register - vessels classed after construction at the occasion of Initial class entry survey (vessels classed by the recognized Classification Society);
.3 specific cases of admission to class, other than above, (i.e. when the vessel has been classed with non-recognised Classification Society or when the vessel has never been classed) - vessels classed for the first time after construction at the occasion of Initial class entry survey.

2 SUSPENSION OF CLASS, WITHDRAWAL OF CLASS, LAY-UP, READMISSION AND RE-COMMISSIONING

2.1 Suspension of class

2.1.1 Classification is automatically suspended and the Certificate of class becomes invalid in one or more of the following cases:

.1 when the Renewal survey has not been completed or is not under attendance for completion prior to resuming trading, by the due date;
.2 when the Intermediate Survey has not been completed by the end of the corresponding survey time window (see the Rules, Chapter III, Section 3), unless the vessel is under attendance for completion of the Intermediate Survey.

Additionally, class is automatically suspended and Certificate of class shall become invalid in the following cases also:

.3 when conversions or alternations, affecting the class are carried out either without approval of the Register or without requesting the attendance of Register or not to the satisfaction of the Register (see the Rules, Chapter I, 2.3.1.2);
.4 if the Register has not been informed when the vessel sustains damage or defect affecting the class, as stated in the Rules, Chapter I, 2.3.1.6;
.5 if the vessel is not operated in compliance to the conditions or limitations stated in the Certificate of class or other pertinent documents or assigned service notation (e.g. draught, area of navigation, type of cargo, main engine power output).

For laid-up ships see 2.5.1.

2.1.2 In above mentioned cases class will be reinstated upon satisfactory completion of the surveys due. Such surveys shall be credited from the date originally due. However, the vessel is disclassed from the date of suspension until the date class is reinstated.

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

2.1.3 The validity of the Certificate of class may be also suspended by written notice to the Owner, following the decision of the Register, in the following cases:

.1 when conditions of class have not been dealt with, or postponed by agreement;
.2 when non-payment of fees occurs;
.3 when the Owner fails to notify the Register on the voyage repairs and maintenance duly in advance.

2.2 Withdrawal of class

2.2.1 The decision to withdraw a vessel's Certificate of class is made by the Head Office of the Register.

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

2.2.3 class may be also withdrawn at the Owner’s written request.

**NOTE:** The Register may withdraw class if the vessel is reported damaged as a constructive total loss or if the vessel is reported as scrapped.

2.2.4 Upon the decision of the Head Office of the Register the class of the vessel may be withdrawn if the Owner does not fulfill or fails to comply with the requirements stated in the Rules, Chapter I, 2.9.5.

2.3 Notification to the Owner and Flag Administration / Authorities

2.3.1 In the cases of class suspension or class withdrawal the Register will forward the Owner written notice.

2.3.2 The omission of such notice however does not absolve the Owner from his responsibility to comply with the Register requirements for maintenance of class.

2.3.3 The Register shall confirm in writing the class suspension, class withdrawal or class reinstatement to the Flag Administration / Authorities.

2.4 Force Majeure

2.4.1 If, due to circumstances reasonably beyond the Owner or the control of the Register the vessel is not in a port where the overdue surveys can be completed at the expiry of the periods permitted above, the Register may permit the vessel to sail, in class, directly to an agreed port at which the survey can be completed.

**NOTE:** In the above context “Force Majeure” should mean: damage to the vessel, unforeseen inability of the Register to attend the vessel due to the governmental restrictions on right of access or movement of personnel, unforeseeable delays in port or inability to discharge cargo due to unusually lengthy periods of severe weather, strikes, civil strife, acts of war, or other cases of force majeure.

2.5 Lay-up and re-commissioning of laid-up vessels

2.5.1 It is the responsibility of the Owner to notify the Register when the vessel is laid-up, or otherwise taken out of service for a period longer than three (3) months. Such notification shall be made in writing.

The vessel laid-up in accordance with the Rules prior to surveys becoming overdue needs not to be suspended when surveys addressed above become overdue.

However, vessels which are laid-up after being suspended as a result of surveys going overdue remain suspended until overdue surveys are completed.

2.5.2 The Company shall, depending on the foreseen duration of laid-up period, decide on the lay-up condition. Such foreseen lay-up period, with proposed lay-up condition shall be communicated in written to the Register.

2.5.3 In order to maintain the class during lay-up period the Owner may decide to regularly carry out periodical surveys as if the vessel is in service. In the case of dry-docking becoming due during lay-up, it may be postponed by agreement until re-commissioning.

Alternatively, the Owner may apply Lay-up maintenance plan, which shall be submitted to the Register for approval.

Lay-up maintenance plan must include information on the safety conditions to be kept throughout the lay-up period, the measures taken to preserve the maintenance of the vessel throughout the lay-up period, scope of surveys and the surveys requirements to be complied with for lay-up, maintenance of class in lay-up and re-commissioning.

Provisions contained in approved Lay-up maintenance plan regarding surveys and inspections to be conducted during lay-up period, should be applied in lieu of regular periodical surveys.

If the vessel is in possession of the approved Lay-up maintenance plan the Class term may be extended (until re-commissioning), subject to agreement with the Register, subject to compliance of the provisions contained in the Lay-up maintenance plan.

2.5.4 When a vessel is intended for a single voyage from lay-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 permit the vessel to proceed on a single direct voyage from the site of lay-up to the repair yard, upon agreement with the Flag Administration / Authorities, provided the Register finds the vessel in satisfactory condition after surveys, the extent of which shall be based on surveys overdue and duration of lay-up. This is not applicable to vessels whose class was already suspended prior to being laid-up.

2.5.5 Scope of re-commissioning survey of a laid-up vessel depends on several factors, such as time in lay-up, maintenance and preservation measures taken during lay-up, survey status at the time of re-commissioning, reason for recommissioning (such as, but not limited to: single voyage for scrap, single voyage to repair yard, etc.), age and the type of a vessel.

For vessels which have been laid-up for a period up to 12 months, an occasional survey shall be carried out, covering imminently due and overdue surveys, only. In addition to that, a visual inspection of other class related items, not covered by previous requirement, may be required when and if found necessary by the attending Surveyor.

For vessels which have been laid-up for a period more than 12 months, an occasional survey shall be carried out, covering all imminently due and overdue surveys. In addition to that, a sea trial for functional testing of the machinery installation shall be carried out also. The scope of survey may be additionally increased if deemed necessary by the attending Surveyor (e.g. in case of longer lay-up periods with no preservation measures or maintenance).

In cases where the vessel has been laid up or has been out of service for a considerable period because of a major repair or modification and the owner elects to only carry out the overdue surveys, the next period of class will start from the expiry date of the Renewal survey. If the owner...
elects to carry out the next due Renewal survey, the new Class term will start from the survey completion date.

2.5.6 For additional statutory requirements special instructions from the relevant Flag Administration / Authorities, or from local Port State authorities shall apply.

2.6 Readmission to class

2.6.1 For a vessel previously classed by the Register, but whose class has been withdrawn due to whatever reason and which in the meantime has not been in possession of valid Certificate of class, readmission to class is possible subject to written request and in-classing survey.

Request must be submitted to the Register by the Owner.

The scope of in-classing survey for the purpose of re-admission to class shall be specially agreed with the Register on a case by case basis, but, in general, such survey should be conducted within the scope of Renewal survey.

Notwithstanding above stated, the Register reserves the right to decide whether any of periodical surveys held in the former Class term should be taken into account or not.

2.7 Reinstatement of class

2.7.1 Each class survey, as well as each condition of class will be assigned a due date for completion. The Register will notify the Owner of these dates and that the vessel's class will be subject to a suspension procedure if the is item is not dealt with, or postponement by agreement, by the due date.

Classification will be reinstated upon verification the overdue surveys / conditions of class have been satisfactorily dealt with, as stipulated for each particular case.

Such surveys shall be credited from the date originally due.

2.7.2 However, the vessel shall be disclassed from the date of suspension until the date when the validity of the Certificate of class has been reinstated.

3 SURVEY DURING CONSTRUCTION

3.1 General

3.1.1 This Section of the Rules is applicable to all vessels, irrespective of their size or navigation area, when being built under survey of the Register for the purpose of classification, directly comprising the following:

1. review/approval of technical documentation of the vessel;
2. surveys at the premises of the manufacturer during manufacture of the materials, machinery, installations and equipment to be installed on board vessel;
3. surveys during construction of the vessel at the premises of the Shipyard in order to obtain appropriate evidence to satisfy itself that the scantlings and construction meet the Rules requirement in relation to the reviewed or approved drawings;
4. surveys during trials and final tests;
5. assigning the Character of class (refer to the Rules, Chapter I, Section 3) and issuing of the Certificate of class upon satisfactory completion of the survey.

3.1.2 Nevertheless, the Register reserves the right to make justified deviation from this requirement, when survey during construction is desired for special service vessels or vessels not to be engaged in international voyages. As a rule, such deviations will not be accepted in respect to structural strength, intact stability, machinery installations and electrical equipment as covered by main class notations.

Compliance with class related requirements does not relieve the interested party from compliance with any statutory requirement demanded by the Flag Administration / Authorities.

3.1.3 This Section of the Rules shall also apply to shipyard subcontractors, when performing fabrication works which are falling under the scope of Classification Survey as defined in the following paragraphs.

3.1.4 Before starting any activities related to construction, it is necessary that the Owner, the Shipyard or the other interested party submits the "Request for survey during construction” to the Register.

3.1.5 Activities which are foreseen to be undertaken in a view of:

1. major modifications or conversions; or
2. significant repairs; or
3. modifications or alternations of the equipment; or
4. change of the navigation area;
5. change of number of passengers;

directly comprises activities required for newbuilding, as specified in 3.1.1, also, in extent as deemed necessary and reasonable by the Register, considering each specific case separately.

3.2 Technical documentation - general

3.2.1 The list of technical documentation, which shall be submitted for review / approval, shall be previously agreed
with the Register, prior to commencement of delivery of such
technical documentation, for each particular vessel.

The list of technical documentation which shall be
submitted for review/approval is given in applicable
requirements of relevant Parts of the Rules, and summary
listed in Tables 3.2-1 to 3.2-15.

Table 3.2-1
Plans and documents to be submitted for review/approval – hull and hull equipment

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
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<tbody>
<tr>
<td>1. Midship section</td>
<td>• Class characteristics</td>
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<tr>
<td>2. Transverse sections</td>
<td>• Main dimensions of a vessel</td>
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<tr>
<td>3. Longitudinal sections</td>
<td>• Maximum draught</td>
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<tr>
<td>4. Shell expansion</td>
<td>• Block coefficient for the length between perpendiculars at the maximum draught</td>
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<tr>
<td>5. Profiles and decks</td>
<td>• Frame spacing</td>
</tr>
<tr>
<td>6. Double bottom</td>
<td>• Contractual service speed</td>
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<tr>
<td>7. Pillar arrangements</td>
<td>• Density of cargoes</td>
</tr>
<tr>
<td>8. Calculation of hull scantlings</td>
<td>• Design loads on decks and double bottom, sides and inner sides, bottom and inner bottom, bulkheads and other structures, as applicable</td>
</tr>
<tr>
<td>9. Calculation of hull girder longitudinal strength</td>
<td>• Location and height of air vent outlets of various compartments</td>
</tr>
<tr>
<td>10. Welding table</td>
<td>• Setting pressure of safety relief valves, if any</td>
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<td></td>
<td>• Loading and unloading procedures</td>
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<tr>
<td></td>
<td>• Openings in decks, inner hull, if any, and shell and relevant compensations</td>
</tr>
<tr>
<td></td>
<td>• Details of structural reinforcements and/or discontinuities</td>
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<td></td>
<td>• Steel grades</td>
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<td></td>
<td>• Corrosion protection</td>
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<td></td>
<td>• Details related to welding and welding joints</td>
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<tr>
<td>11. Watertight subdivision bulkheads</td>
<td>• Openings and their closing appliances, if any</td>
</tr>
<tr>
<td>12. Watertight tunnels</td>
<td>• Location and height of air vent outlets of various compartments</td>
</tr>
<tr>
<td>13. Fore part structure</td>
<td>• All part structure</td>
</tr>
<tr>
<td></td>
<td>• Location and height of air vent outlets of various compartments</td>
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<tr>
<td>14. Transverse thruster, if any, general arrangement, tunnel structure, connections of thruster with tunnel and hull structures</td>
<td>• Mass and centre of gravity of machinery and boilers, if any</td>
</tr>
<tr>
<td>15. All part structure</td>
<td>• Mass of liquids contained in the engine room</td>
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<td>16. Machinery space structures</td>
<td>• Type, power and rpm. of propulsion machinery</td>
</tr>
<tr>
<td>17. Foundations of propulsion machinery</td>
<td>• Extension and mechanical properties of the aluminium alloy used (where applicable)</td>
</tr>
<tr>
<td>18. Superstructures and deckhouses</td>
<td>• Design loads on hatch covers</td>
</tr>
<tr>
<td>19. Machinery space casing</td>
<td>• Sealing and securing arrangements, type and position of locking bolts</td>
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<tr>
<td>20. Hatch covers, if any</td>
<td>• Distance of hatch covers from the load waterline and from the fore end</td>
</tr>
<tr>
<td>21. Movable decks and ramps, if any</td>
<td>• Arrangement and dimensions of bulwarks and freeing ports on the upper deck and superstructure deck</td>
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<tr>
<td>22. Windows and side scuttles, arrangements and details</td>
<td>• Maximum ahead service speed</td>
</tr>
<tr>
<td>23. Scuppers and sanitary discharges</td>
<td>• Propeller shaft bossing and brackets</td>
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<tr>
<td>24. Bulwarks and freeing ports</td>
<td>• River chests</td>
</tr>
<tr>
<td>25. Rudder 1)</td>
<td>•</td>
</tr>
<tr>
<td>26. Stern frame or stern post, stern tube</td>
<td>•</td>
</tr>
<tr>
<td>27. Propeller shaft bossing and brackets 1)</td>
<td>•</td>
</tr>
<tr>
<td>28. River chests</td>
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Table 3.2-1 (continued)

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
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<tbody>
<tr>
<td>29. Hawse pipes</td>
<td></td>
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<tr>
<td>30. Plan of outer doors and hatchways</td>
<td></td>
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<tr>
<td>31. Plan of manholes</td>
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<td>32. Plan of access to and escape from spaces</td>
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<td>33. Plan of ventilation</td>
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<td>34. Plan of watertight doors and scheme of relevant manoeuvring devices</td>
<td>• Manoeuvring devices</td>
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<tr>
<td></td>
<td>• Electrical diagrams of power control and position indication</td>
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<td></td>
<td>circuits</td>
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<td>35. Equipment</td>
<td>• List of equipment</td>
</tr>
<tr>
<td></td>
<td>• Construction and breaking load of steel wires</td>
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<td></td>
<td>• Material, construction, breaking load and relevant elongation of</td>
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<td>36. Technical specification</td>
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<td>37. General arrangement</td>
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<td>38. Lines plan</td>
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<td>39. Hydrostatic curves</td>
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<td>40. Lightweight distribution</td>
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<tr>
<td>41. Capacity plan</td>
<td>• Indication of the volume and position of the centre of gravity of</td>
</tr>
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<td></td>
<td>all compartments and tanks</td>
</tr>
<tr>
<td>42. Corresponding technical descriptions, calculations and data, as applicable</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Where other steering or propulsion systems are adopted (e.g. steering nozzles or azimuth propulsion systems), the plans showing the relevant arrangement and hull structural scantlings shall be submitted.

General notes:
When direct calculation analyses are carried out by the Designer according to the Rules requirements, they shall also be submitted to the Register.

Table 3.2-2
Plans and documents to be submitted for review/approval – internal combustion engines

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Engine technical specification</td>
<td>• General view plans and engine particulars and crankshaft</td>
</tr>
<tr>
<td></td>
<td>calculation (for each cylinder configuration)</td>
</tr>
<tr>
<td>2. Engine transverse cross-section</td>
<td></td>
</tr>
<tr>
<td>3. Engine longitudinal section</td>
<td></td>
</tr>
<tr>
<td>4. Bedplate and crankcase, cast or welded, with welding details and instructions</td>
<td>• The weld procedure specification (WPS) shall include details of</td>
</tr>
<tr>
<td></td>
<td>pre and post weld heat treatment, weld</td>
</tr>
<tr>
<td></td>
<td>consumables and fit-up conditions</td>
</tr>
<tr>
<td>5. Thrust bearing assembly &lt;1&gt;</td>
<td></td>
</tr>
<tr>
<td>6. Tie rods</td>
<td></td>
</tr>
<tr>
<td>7. Cylinder cover / cylinder block head, assembly</td>
<td></td>
</tr>
<tr>
<td>8. Cylinder liner</td>
<td></td>
</tr>
<tr>
<td>9. Crankshaft details, for each number of cylinders</td>
<td></td>
</tr>
<tr>
<td>10. Crankshaft assembly, for each number of cylinders</td>
<td></td>
</tr>
<tr>
<td>11. Thrust shaft or intermediate shaft (if integral with engine)</td>
<td></td>
</tr>
<tr>
<td>12. Shaft coupling bolts</td>
<td></td>
</tr>
<tr>
<td>13. Counter weights (if not integral with crankshaft)</td>
<td>• Fastening bolts (bolt fastening instructions)</td>
</tr>
<tr>
<td>14. Connecting rod, details</td>
<td></td>
</tr>
<tr>
<td>15. Connecting rod, assembly (bolt fastening instructions)</td>
<td></td>
</tr>
<tr>
<td>16. Piston, assembly</td>
<td></td>
</tr>
<tr>
<td>17. Camshaft drive, assembly</td>
<td></td>
</tr>
<tr>
<td>18. Flywheel</td>
<td></td>
</tr>
<tr>
<td>19. Fuel oil injection pump</td>
<td></td>
</tr>
<tr>
<td>20. Material specification of main parts</td>
<td>• Non-destructive material tests and pressure tests &lt;1&gt;</td>
</tr>
<tr>
<td>21. Arrangement of foundation bolts (for propulsion engines only)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2-2 (continued)

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Schematic layout or other equivalent documentation of fuel oil, lubricating oil, cooling water and starting air system on the engine</td>
<td>• The system so far as supplied by the engine manufacturer</td>
</tr>
<tr>
<td>23. Schematic diagram of engine control and safety system on the engine</td>
<td>• The system so far as supplied by the engine manufacturer</td>
</tr>
<tr>
<td>24. Shielding and insulation of exhaust gas pipes, assembly</td>
<td></td>
</tr>
<tr>
<td>25. Shielding of high-pressure fuel pipes, assembly (all engines)</td>
<td>• Recovery and leak detection devices</td>
</tr>
<tr>
<td>26. Arrangement of crankcase explosion relief valves (only for engines of a cylinder diameter of 200.0 mm and more or a crankcase volume of 0.6 m$^3$ or more)</td>
<td>• Volume of crankcase and other spaces: camshaft drive, scavenge, etc.</td>
</tr>
<tr>
<td>27. Operation and service manuals - maintenance requirements (servicing and repair)</td>
<td>• Details of any special tools and gauges that shall be used with their fitting/settings together with any test requirements on completion of maintenance</td>
</tr>
<tr>
<td>28. Details of the type test program and the type test report</td>
<td></td>
</tr>
<tr>
<td>29. High-pressure parts for fuel oil injection system</td>
<td>• Specification of pressures, pipe dimensions and materials</td>
</tr>
<tr>
<td>30. Cross-sectional drawings with main dimensions</td>
<td></td>
</tr>
<tr>
<td>31. Drawings of rotating parts</td>
<td>• Shaft, turbine wheel, compressor wheel and blades</td>
</tr>
<tr>
<td>32. Details of blade fixing</td>
<td></td>
</tr>
<tr>
<td>33. Arrangement and flow diagram of lubrication system</td>
<td></td>
</tr>
<tr>
<td>34. Technical specification of the turbocharger</td>
<td>• The maximum operating conditions (maximum permissible rotational speed and maximum permissible temperature)</td>
</tr>
<tr>
<td>35. Material specifications for the main parts</td>
<td>• Physical, chemical and mechanical properties, values of tensile strength, average stress to produce creep, resistance to corrosion and heat treatments</td>
</tr>
<tr>
<td>36. Operation and service manual</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1) For comparison with the Register requirements for material, NDT and pressure testing as applicable.
2) To be submitted only if the thrust bearing is integral with the engine and not integrated in the engine bedplate.
3) The type test report may be submitted shortly after the conclusion of the type test.
4) Those plans shall be constructional plans with all main dimensions and shall contain any necessary information relevant to the type and quality of the materials employed. In the case of welded rotating parts, all relevant welding details shall be included in the above plans and the procedures adopted for welding or for any heat treatments will be subject to approval by the Register.

### Table 3.2-3

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shafting arrangement plan</td>
<td></td>
</tr>
<tr>
<td>2. Thrust shaft</td>
<td></td>
</tr>
<tr>
<td>3. Intermediate shafts</td>
<td></td>
</tr>
<tr>
<td>4. Propeller shaft</td>
<td></td>
</tr>
<tr>
<td>5. Shaft liners, relevant manufacture and welding procedures, if any</td>
<td></td>
</tr>
<tr>
<td>6. Couplings and coupling bolts</td>
<td></td>
</tr>
<tr>
<td>7. Flexible couplings</td>
<td></td>
</tr>
<tr>
<td>8. Stern tube</td>
<td></td>
</tr>
<tr>
<td>9. Details of stern tube glands</td>
<td></td>
</tr>
<tr>
<td>10. Oil piping diagram for oil lubricated propeller shaft bearings</td>
<td></td>
</tr>
<tr>
<td>11. Shaft alignment calculation</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1) This drawing shall show the entire shafting, from the main engine coupling flange to the propeller. The location of the thrust block, and the location and number of shafting bearings (type of material and length) are also to be shown.
2) The manufacturer of the elastic coupling is also to submit all data necessary to enable the stresses to be evaluated.
### Table 3.2-4
Plans and documents to be submitted for review/approval – propellers

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid propellers</td>
<td></td>
</tr>
<tr>
<td>1. Sectional assembly</td>
<td></td>
</tr>
<tr>
<td>2. Blade and hub details</td>
<td></td>
</tr>
<tr>
<td>3. Rating (power, rpm, etc.)</td>
<td></td>
</tr>
<tr>
<td>4. Data and procedures for fitting propeller to the shaft</td>
<td></td>
</tr>
<tr>
<td>Built-up and controllable pitch propellers</td>
<td></td>
</tr>
<tr>
<td>5. Same documents requested for solid propellers</td>
<td></td>
</tr>
<tr>
<td>6. Blade bolts and pre-tensioning procedures</td>
<td></td>
</tr>
<tr>
<td>7. Pitch corresponding to maximum propeller thrust and to normal service condition</td>
<td></td>
</tr>
<tr>
<td>8. Pitch control mechanism</td>
<td></td>
</tr>
<tr>
<td>9. Pitch control hydraulic system</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.2-5
Plans and documents to be submitted for review/approval – boilers, pressure vessels and heat exchangers

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Construction drawings with sections and details</td>
<td>• Necessary data for checking the calculations and structures (scantlings, materials, working parameters, location and dimensions of weld seams, fastenings, etc.)</td>
</tr>
<tr>
<td>2. Construction drawings for the components listed in the Rules, Part 3 – Machinery, Systems and Electricity, Chapter I, Table 5.1.5-1, unless all necessary data are shown in drawings mentioned above</td>
<td></td>
</tr>
<tr>
<td>3. Arrangement drawings for mountings and fittings</td>
<td>• Mountings’ and fittings’ specifications</td>
</tr>
<tr>
<td>4. Strength calculations for components subject to pressure other than mountings, fittings, flanges and fastenings, if the latter complies with the recognized standards approved by the Register</td>
<td></td>
</tr>
<tr>
<td>5. Calculation of the diameters of safety valves</td>
<td></td>
</tr>
<tr>
<td>6. Welding process specifications (WPS)</td>
<td></td>
</tr>
<tr>
<td>7. Drawings of oil burning installations</td>
<td>• The description of their mode of operation</td>
</tr>
<tr>
<td>8. Data of heat treatment, of inspection of welded joints, and of hydraulic tests</td>
<td></td>
</tr>
<tr>
<td>9. Data of intended use of pressure vessel and heat exchanger and of working media</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.2-6
Plans and documents to be submitted for review/approval – thermal oil heaters

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Description of the system</td>
<td>• The discharge and return temperature, the maximum film temperature, the total volume of the system, physical and chemical characteristics of the thermal oil</td>
</tr>
<tr>
<td>2. Drawings of the heaters, the expansion tank (vessel) and the drainage and storage tanks</td>
<td></td>
</tr>
<tr>
<td>3. Piping flow chart with fittings</td>
<td></td>
</tr>
<tr>
<td>4. Circuit diagrams of the electrical control system, respectively monitoring and safety devices with limiting values</td>
<td></td>
</tr>
<tr>
<td>5. Functional diagram</td>
<td>• Safety and monitoring devices and valves provided</td>
</tr>
</tbody>
</table>
### Table 3.2-7
Plans and documents to be submitted for review/approval – oil burners and oil firing equipment

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>General drawings of the oil burner</td>
</tr>
<tr>
<td>2.</td>
<td>Piping and equipment diagram of the burner including • Parts list</td>
</tr>
<tr>
<td>3.</td>
<td>Description of function</td>
</tr>
<tr>
<td>4.</td>
<td>Electrical diagrams</td>
</tr>
<tr>
<td>5.</td>
<td>List of equipment regarding electrical control and safety</td>
</tr>
<tr>
<td>6.</td>
<td>Confirmation by the manufacturer that the oil burner and the oil firing equipment are suitable for the fuels intended to be used</td>
</tr>
</tbody>
</table>

### Table 3.2-8
Plans and documents to be submitted for review/approval – compressed gas cylinders

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Description of manufacturing process</td>
</tr>
<tr>
<td>2.</td>
<td>Specification of materials and heat treatment</td>
</tr>
<tr>
<td>3.</td>
<td>Drawings of cylinders and of fittings</td>
</tr>
<tr>
<td>4.</td>
<td>Strength calculation</td>
</tr>
<tr>
<td>5.</td>
<td>Test pressure, in [bar]</td>
</tr>
<tr>
<td>6.</td>
<td>Capacity, in [l], and empty weight, in [kg]</td>
</tr>
</tbody>
</table>

### Table 3.2-9
Plans and documents to be submitted for review/approval – gearing

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Constructional drawings of shafts and flanges • Specification and details of hardening procedure – core and surface mechanical characteristics – diagram of the depth of the hardened layer as a function of hardness values • Specification and details of the finishing procedure – finishing method of tooth flanks (hobbing, shaving, lapping, grinding, shot-peening) – surface roughness for tooth flank and root fillet – tooth flank corrections (helix modification, crowning, tip-relief, end-relief), if any – grade of accuracy according to ISO 1328-1 1997</td>
</tr>
<tr>
<td>2.</td>
<td>Constructional drawings of pinions and wheels</td>
</tr>
<tr>
<td>3.</td>
<td>Shrinkage calculation for shrunk-on pinions, wheels rims and/or hubs with indication of the minimum and maximum shrinkage allowances</td>
</tr>
<tr>
<td>4.</td>
<td>Calculation of load capacity of the gears</td>
</tr>
<tr>
<td>5.</td>
<td>Constructional drawings of casings</td>
</tr>
<tr>
<td>6.</td>
<td>Functional diagram of the lubricating system • Specified grade of lubricating oil • Expected oil temperature in service • Kinematic viscosity of the oil</td>
</tr>
<tr>
<td>7.</td>
<td>Functional diagram of control, monitoring and safety systems</td>
</tr>
<tr>
<td>8.</td>
<td>Longitudinal and transverse cross-sectional assembly of the gearing, with indication of the type of clutch</td>
</tr>
<tr>
<td>9.</td>
<td>Data form for calculation of gears</td>
</tr>
<tr>
<td>10.</td>
<td>Detailed justification of material quality used for gearing calculation (ML, MQ, or ME according to ISO 6336-5)</td>
</tr>
<tr>
<td>11.</td>
<td>Type of driving and driven machines and, if provided, type of flexible coupling</td>
</tr>
</tbody>
</table>
### Table 3.2-9 (continued)

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Maximum power transmitted by each pinion in continuous running and corresponding rotational speed, for all operating conditions, including clutching-in</td>
</tr>
<tr>
<td>13.</td>
<td>Modules of teeth for pinion and wheels</td>
</tr>
<tr>
<td>14.</td>
<td>Pressure angle and helix angle</td>
</tr>
<tr>
<td>15.</td>
<td>Tooth profiles of pinions and wheels together with tip diameters and fillet radius</td>
</tr>
<tr>
<td>16.</td>
<td>Operating centre distance</td>
</tr>
<tr>
<td>17.</td>
<td>Addendum of the cutting tool</td>
</tr>
<tr>
<td>18.</td>
<td>Common face width, operating pitch diameter</td>
</tr>
<tr>
<td>19.</td>
<td>Data related to the bearings • Type, characteristics and designed service life of roller bearings • Materials and clearances of plain bearings • Position of each gear in relation to its bearings</td>
</tr>
<tr>
<td>20.</td>
<td>Torsional vibration data (inertia and stiffness)</td>
</tr>
</tbody>
</table>

**Notes:**
1) Constructional drawings shall be accompanied by the specification of the materials employed including the chemical composition, heat treatment and mechanical properties and, where applicable, the welding details, welding procedure and stress relieving procedure.

### Table 3.2-10

Plans and documents to be submitted for review/approval – piping system

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Technical description of piping systems</td>
</tr>
<tr>
<td>2.</td>
<td>Drawing showing the arrangement of the river chests and vessel side and bottom valves and fittings</td>
</tr>
<tr>
<td>3.</td>
<td>Diagram of the bilge and ballast systems (in and outside machinery spaces) • Calculation for the bilge main, bilge branch lines and bilge pumps capacity as per Rules requirements</td>
</tr>
<tr>
<td>4.</td>
<td>Specification of the central priming system intended for bilge pumps, when provided</td>
</tr>
<tr>
<td>5.</td>
<td>Diagram of the drinking water, scuppers and sanitary discharge systems</td>
</tr>
<tr>
<td>6.</td>
<td>Diagram of the air, sounding and overflow systems</td>
</tr>
<tr>
<td>7.</td>
<td>Diagram of cooling systems (river water and fresh water)</td>
</tr>
<tr>
<td>8.</td>
<td>Diagram of fuel oil system</td>
</tr>
<tr>
<td>9.</td>
<td>Drawings of the fuel oil tanks not forming part of the vessel’s structure, if any</td>
</tr>
<tr>
<td>10.</td>
<td>Diagram of the lubricating oil system</td>
</tr>
<tr>
<td>11.</td>
<td>Diagram of the thermal oil system</td>
</tr>
<tr>
<td>12.</td>
<td>Diagram of the hydraulic systems intended for essential services or located in machinery spaces</td>
</tr>
<tr>
<td>13.</td>
<td>Diagram of steam system, including safety valve exhaust and drain pipes</td>
</tr>
<tr>
<td>14.</td>
<td>Diagram of the boiler feed water and condensate system</td>
</tr>
<tr>
<td>15.</td>
<td>Diagram of the compressed air system including starting air calculation as per Rules requirements</td>
</tr>
<tr>
<td>16.</td>
<td>Diagram of the hydraulic and pneumatic remote control systems</td>
</tr>
<tr>
<td>17.</td>
<td>Diagram of the remote level gauging system</td>
</tr>
<tr>
<td>18.</td>
<td>Diagram of the exhaust gas system</td>
</tr>
<tr>
<td>19.</td>
<td>Diagram of drip trays and gutterways draining system</td>
</tr>
<tr>
<td>20.</td>
<td>Arrangement of the ventilation system</td>
</tr>
<tr>
<td>21.</td>
<td>Drawings and specification of valves and accessories</td>
</tr>
<tr>
<td>22.</td>
<td>Drawings and specification for valves and accessories if not designed in accordance with recognized standards (unconventional design)</td>
</tr>
</tbody>
</table>
### Table 3.2-10 (continued)

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.</td>
<td>Nature, service temperature and pressure of the fluids</td>
</tr>
<tr>
<td>24.</td>
<td>Material, external diameter and wall thickness of the pipes</td>
</tr>
<tr>
<td>25.</td>
<td>Type of the connections between pipe lengths</td>
</tr>
<tr>
<td></td>
<td>- Details of the welding, where provided</td>
</tr>
<tr>
<td>26.</td>
<td>Material, type and size of the accessories</td>
</tr>
<tr>
<td>27.</td>
<td>Capacity, prime mover</td>
</tr>
<tr>
<td></td>
<td>- Location of the pumps, when requested</td>
</tr>
<tr>
<td>28.</td>
<td>Constructional drawings of independent tanks showing</td>
</tr>
<tr>
<td></td>
<td>- The height of the overflow and air pipe above the tank top</td>
</tr>
<tr>
<td>29.</td>
<td>Plastic pipes</td>
</tr>
<tr>
<td></td>
<td>- The chemical composition</td>
</tr>
<tr>
<td></td>
<td>- The physical and mechanical characteristics in function of temperature</td>
</tr>
<tr>
<td></td>
<td>- The characteristics of inflammability and fire resistance</td>
</tr>
<tr>
<td></td>
<td>- The resistance to the products intended to be conveyed</td>
</tr>
</tbody>
</table>

**Notes:**
1) Diagrams are also to include, where applicable, the (local and remote) control and monitoring systems and automation systems.

### Table 3.2-11

Plans and documents to be submitted for review/approval – steering gear

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assembly drawing of the steering gear</td>
</tr>
<tr>
<td></td>
<td>- Sliding blocks, guides, stops and other similar components</td>
</tr>
<tr>
<td>2.</td>
<td>General description of the installation and of its functioning principle</td>
</tr>
<tr>
<td>3.</td>
<td>Operating manuals of the steering gear and of its main components</td>
</tr>
<tr>
<td>4.</td>
<td>Description of the operational modes intended for steering in normal and emergency conditions</td>
</tr>
<tr>
<td>5.</td>
<td>For hydraulic steering gear, the schematic layout of the hydraulic piping of power actuating systems</td>
</tr>
<tr>
<td></td>
<td>- The hydraulic fluid refilling system, with indication of:</td>
</tr>
<tr>
<td></td>
<td>- the design pressure</td>
</tr>
<tr>
<td></td>
<td>- the maximum working pressure expected in service</td>
</tr>
<tr>
<td></td>
<td>- the diameter, thickness, material specification and connection details of the pipes</td>
</tr>
<tr>
<td></td>
<td>- the hydraulic fluid tank capacity</td>
</tr>
<tr>
<td></td>
<td>- the flashpoint of the hydraulic fluid</td>
</tr>
<tr>
<td>6.</td>
<td>For hydraulic pumps of drive units, the assembly longitudinal and transverse sectional drawings and the characteristic curves</td>
</tr>
<tr>
<td>7.</td>
<td>Assembly drawings of the rudder actuators and constructional drawings of their components</td>
</tr>
<tr>
<td></td>
<td>- For hydraulic actuators, indication of:</td>
</tr>
<tr>
<td></td>
<td>- the design torque</td>
</tr>
<tr>
<td></td>
<td>- the maximum working pressure</td>
</tr>
<tr>
<td></td>
<td>- the relief valve setting pressure</td>
</tr>
<tr>
<td>8.</td>
<td>Constructional drawings of the relief valves for protection of the hydraulic actuators</td>
</tr>
<tr>
<td></td>
<td>- the setting pressure</td>
</tr>
<tr>
<td></td>
<td>- the relieving capacity</td>
</tr>
<tr>
<td>9.</td>
<td>Diagrams of the electric power circuits</td>
</tr>
<tr>
<td>10.</td>
<td>Functional diagram of control, monitoring and safety systems</td>
</tr>
<tr>
<td></td>
<td>- The remote control from the wheelhouse, with indication of the location of control, monitoring and safety devices</td>
</tr>
<tr>
<td>11.</td>
<td>Constructional drawings of the strength parts providing a mechanical transmission of forces to the rudder stock (tiller, quadrant, connecting rods and other similar items)</td>
</tr>
<tr>
<td></td>
<td>- The calculation notes of the shrink-fit connections</td>
</tr>
<tr>
<td>12.</td>
<td>For azimuth thrusters used as steering means the specification and drawings of the steering mechanism</td>
</tr>
<tr>
<td></td>
<td>- where applicable, appropriate documents listed above</td>
</tr>
</tbody>
</table>

**Notes:**
1) Constructional drawings shall be accompanied by the specification of the materials employed and, where applicable, by the welding details and welding procedures.
Table 3.2-12
Plans and documents to be submitted for review/approval – thrusters

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General requirements for all thrusters</strong></td>
<td></td>
</tr>
<tr>
<td>1. General arrangements of the thruster</td>
<td></td>
</tr>
<tr>
<td>2. Propeller, including the applicable details</td>
<td></td>
</tr>
<tr>
<td>3. Bearing details</td>
<td></td>
</tr>
<tr>
<td>4. Propeller and intermediate shafts and couplings</td>
<td></td>
</tr>
<tr>
<td>5. Gears, including the applicable details</td>
<td></td>
</tr>
<tr>
<td>6. Rated power and revolutions</td>
<td></td>
</tr>
<tr>
<td>7. Rated thrust</td>
<td></td>
</tr>
<tr>
<td>8. Material specifications of the major parts, including</td>
<td>Their physical, chemical and mechanical properties</td>
</tr>
<tr>
<td>9. Where parts of thrusters are of welded construction, all particulars on the design of welded joints, welding procedures, heat treatments and non-destructive examinations after welding</td>
<td></td>
</tr>
<tr>
<td>10. Where applicable, background information on previous operating experience in similar applications</td>
<td></td>
</tr>
<tr>
<td><strong>Specific requirements for transverse thrusters</strong></td>
<td></td>
</tr>
<tr>
<td>11. Structure of the tunnel</td>
<td>The materials and their thickness</td>
</tr>
<tr>
<td>12. Structural equipment or other connecting devices which transmit the thrust from the propeller to the tunnel</td>
<td></td>
</tr>
<tr>
<td>13. Sealing devices</td>
<td>Propeller shaft gland and thruster-tunnel connection</td>
</tr>
<tr>
<td>14. Pitch control device and corresponding monitoring system for the adjustable pitch propellers</td>
<td></td>
</tr>
<tr>
<td><strong>Specific requirements for rotating and azimuth thrusters</strong></td>
<td></td>
</tr>
<tr>
<td>15. Structural items (nozzle, bracing, etc.)</td>
<td></td>
</tr>
<tr>
<td>16. Structural connection to hull</td>
<td></td>
</tr>
<tr>
<td>17. Rotating mechanism of the thruster</td>
<td></td>
</tr>
<tr>
<td>18. Thruster control system</td>
<td></td>
</tr>
<tr>
<td>19. Piping systems connected to thruster</td>
<td></td>
</tr>
<tr>
<td><strong>Specific requirements for water-jet</strong></td>
<td></td>
</tr>
<tr>
<td>20. General arrangement of the water-jet</td>
<td>The materials, the thicknesses and the forces acting on the hull</td>
</tr>
<tr>
<td>21. Casing (duct) (location and shape)</td>
<td>Their control devices as well as the corresponding hydraulic diagrams</td>
</tr>
<tr>
<td>22. Details of the shafts, flanges, keys</td>
<td></td>
</tr>
<tr>
<td>23. Sealing gland</td>
<td></td>
</tr>
<tr>
<td>24. Bearings</td>
<td></td>
</tr>
<tr>
<td>25. Impeller</td>
<td></td>
</tr>
<tr>
<td>26. Steering and reversing buckets</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2-13
Plans and documents to be submitted for review/approval – liquefied gas installations for domestic purposes

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diagrammatic drawings</td>
<td>• Service pressure</td>
</tr>
<tr>
<td></td>
<td>• Size and nature of materials for piping</td>
</tr>
<tr>
<td></td>
<td>• Capacity and other technical characteristics for accessories</td>
</tr>
<tr>
<td></td>
<td>• In general, all information allowing the verification of the requirements given in the Rules, Part 3 – Machinery, Systems and Electricity, Chapter I, Section 13.</td>
</tr>
</tbody>
</table>

### Table 3.2-14
Plans and documents to be submitted for review/approval – electrical installations

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General plans concerning the entire electrical installation</td>
<td></td>
</tr>
<tr>
<td>2. Plans of the main switchboards, the emergency switchboards, the distribution switchboards, showing the most important technical data such as amperage of the nominal current of fuses and switching devices</td>
<td></td>
</tr>
<tr>
<td>3. Indications of power requirements for electrical service equipment</td>
<td></td>
</tr>
<tr>
<td>4. Types of cables indicating conductor cross-sections</td>
<td></td>
</tr>
<tr>
<td>5. For electric vessel propulsion systems, switchboard plans as well as electric propulsion engine documentation</td>
<td></td>
</tr>
<tr>
<td>6. Plans of electronic steering control, regulating, alarm and safety systems</td>
<td></td>
</tr>
<tr>
<td>7. Control circuit plans</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.2-15
Plans and documents to be submitted for review/approval – fire protection

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Structural fire protection</td>
<td>• The method of construction, purpose and category of the various spaces of the vessels, means of closings of openings in “A” and “B” class divisions</td>
</tr>
<tr>
<td>2. Ventilation plans</td>
<td>• The ducts and any fire dampers in them and the position of the controls for the stopping the system</td>
</tr>
<tr>
<td>3. Means of escape and access to the different compartments</td>
<td>• relevant dimensioning</td>
</tr>
<tr>
<td>4. Fire detection and alarm systems</td>
<td></td>
</tr>
<tr>
<td>5. General water fire-extinguishing systems</td>
<td>• Main and emergency fire pumps and fire main including the capacity and head of the pumps</td>
</tr>
<tr>
<td></td>
<td>• Hydrant and hose locations</td>
</tr>
<tr>
<td>6. Arrangement of each fixed gas fire-extinguishing systems</td>
<td>• Calculations for the quantities of the media used and the proposed rates of application 1)</td>
</tr>
<tr>
<td>7. Arrangement of the automatic pressure water spraying (sprinkler) systems</td>
<td>• The capacity and head of the pumps 1)</td>
</tr>
<tr>
<td>8. Fire control plan</td>
<td></td>
</tr>
<tr>
<td>9. Plan showing the location and arrangement of the emergency stop for the fuel oil unit pumps and for closing the valves on the pipes from fuel oil tanks</td>
<td></td>
</tr>
<tr>
<td>10. Electrical diagram of the fixed gas fire-extinguishing systems</td>
<td></td>
</tr>
<tr>
<td>11. Electrical diagram of the automatic pressure water spraying systems</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2-15 (continued)

<table>
<thead>
<tr>
<th>Plan or document</th>
<th>Containing also information on</th>
</tr>
</thead>
</table>
| 12. General arrangement plan | • Disposition of all the fire-extinguishing equipment including the fire main, the fixed fire-extinguishing systems in the cargo holds, on deck and in the machinery spaces  
• Disposition of the portable and non-portable fire extinguishers |

### Notes:
1) Plans shall be schematic and functional and to contain all information necessary for their correct interpretation and verification, such as:
- service pressures;
- capacity and head of pumps and compressors, if any;
- materials and dimensions of piping and associated fittings;
- volumes of protected rooms, for gas, foam and aerosol fire-extinguishing systems;
- surface areas of protected zones for automatic pressure water spraying, low expansion foam and powder fire-extinguishing systems;
- capacity, in volume and/or in mass, of pressure tanks or compressed gas cylinders containing the extinguishing media or propelling gases, for gas, automatic pressure water spraying, foam and powder fire-extinguishing systems;
- type, number and location of nozzles of extinguishing media for gas, automatic pressure water spraying, foam and powder fire-extinguishing systems.

### General notes:
All or part of the information may be provided, instead of on the above plans, in suitable operation manuals or in specifications of the systems.

Notwithstanding above stated, the Register reserves the right to ask for additional documentation according to the specific nature of the vessel to be classed, if considers necessary.

Design calculations shall be provided, when called for, as supporting documents to the submitted plans. It shall be noted that submitted document may cover more than one of the listed requirements, and that single requirement may be covered by more than one submitted document.

The extent of technical documentation for the vessels having special design features shall be determined for every such vessel in agreement with the Register.

#### 3.2.2 It is the responsibility of the Owner or Shipyard to ascertain that the design data are correct, complete and compatible with the use of the vessel.

Technical documentation shall be submitted to the Register, for review/approval, duly in advance of starting the construction, or exceptionally, duly in advance prior to commencement of particular phase of the construction of the vessel, which shall be specially arranged with the Register.

Technical documentation shall be submitted in English or other language agreed upon with Register.

All information which may influence the judgement and decisions made by the Register during the process of approval shall be made available to the Register. It is the responsibility of the shipbuilder to ensure that such information is brought to the attention of the Register in time.

#### 3.2.3 Technical documentation shall be produced in the manner of common good shipbuilding practice and shall be elaborated and completed with all necessary data to make checking whether vessel complies with the requirements of the Rules possible.

Design data and calculations shall be adequately referenced. It is the duty of the Shipyard or the Owner to ascertain that the references used are correct, complete and applicable to the design of the vessel.

In the case of conflicting information, submitted documentation will be considered in the following order for precedence: design data, plans, design and calculation.

#### 3.2.4 The documentation forming the basis for the survey is, at all times, to reflect the true conditions. Revisions of documents are therefore to be submitted to the Register to the extent such revisions may influence decisions or statements made by the Register.

Revisions of already reviewed / approved documentation regarding items covered by classification shall be submitted to the Register for review/approval prior to being realised. Such documentation shall be specially marked to identify revisions made.

#### 3.2.5 It is the responsibility of the Shipyard to ascertain that drawings used for procurement, construction and other works (shop drawings) are in compliance with the technical documentation approved by the Register.

#### 3.2.6 The Register may, at its discretion and subject to conditions and checks deemed appropriate, accept the plans and documentation approved by other recognized Classification Society, as far as classification is concerned and according to the principle of equivalence of the Rules and other works are in accordance with the approved drawings and plans, i.e. the Register may consider the acceptance of alternatives to these Rules, provided that they are deemed to be equivalent to the Rules to the satisfaction of the Register.

#### 3.3 Examination of technical documentation

#### 3.3.1 Technical documentation including drawings, construction plans and outline specification of the vessel, corresponding technical descriptions, calculations and data including material specifications, may be submitted to the Register for review/approval either in electronic or paper format (at least in three copies), unless required or agreed otherwise. Submitted documentation shall contain all information and details necessary for the assessment of the
design of the vessel for the purpose of class assignment and required to verify compliance with the Rules.

3.3.2 After examination by the Register, the technical documentation subject to review/approval shall be confirmed by the seal of the Register.

All conditions and restrictions, deriving from plan approval, and relevant for a specific document may be indicated on the technical documentation itself and/or on the pertinent appraisal letter.

One copy of each document with remarks related to the compliance with the Rule requirements, with pertinent appraisal letter will be communicated to the Shipyard or the Owner.

The approval does not refer to the parts and construction details, contained in the approved technical documentation, which are not covered by the Rules.

If subsequent information indicates that the design solutions are against the requirements of the Rules, the Register may revoke approval of the technical documentation at any time.

3.4 Field survey at the premises of the Shipyard

3.4.1 The Register will assess the production facilities and procedures of the Shipyard, subcontractors and other manufacturers, to determine whether they meet the requirements of the Rules and any additional requirements of the Owner as agreed in the building specification. This assessment may be connected with a quality assurance certification.

3.4.2 During construction, the Surveyor shall be given free and safe access to all works directly or indirectly affecting Classification Survey during construction. In that respect the Shipyard shall provide necessary facilities and safe working environment for the safe execution of the survey as stated in the present Rules, Chapter 1, 2.2. This includes, inter alia, provision of the suitable and safe means of access, i.e. scaffolding, working platforms and related equipment, illumination, ventilation, temporary barriers, guard-rails or other equivalent arrangements to prevent falling down, as well as posting of warnings on possible danger from objects falling from the working areas.

Safety measures and arrangements to be applied should be agreed between the Shipyard and the Register in advance, prior starting surveying activities.

**NOTE:** For additional requirements related to safety of Surveyors the following may be considered also (as far as applicable): IACS Rec 91 - “Guidelines for acceptance / approval of alternative means of access”, IACS Rec 78 - "Safe use of portable ladders for close-up survey", IACS Rec 72 - "Confined space safe practice", EU Directive 2001/45/EC, amending Directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work.

3.4.3 It is the duty of the Shipyard, subcontractors and/or other manufacturers to duly notify and arrange with the local station office of the Register on surveys and testing to be performed, as each phase during construction, which shall be inspected by the Register, is completed.

After such notification the Surveyor will inspect the work performed in order to establish whether the requirements of the Rules have been met.

In addition to that, the Shipyard is responsible for the organisation of the survey in agreed time schedules.

3.4.4 The scope and the extent of surveys, as well as how the list of specific activities shall be addressed, should be agreed between the Register and the Shipyard during the kick-off meeting and shall be based on elements such as experience feedback, patrolling and spot checks.

3.4.5 The survey may consist of a combination of visual inspections, witnessing during tests and measurement and review of records.

3.4.6 The field survey at the premises of the Shipyard shall verify:

1. that the construction and scantlings of the vessel comply with the requirements of the Rules and reviewed / approved plans and that the required materials are used;
2. that the materials, components and equipment, intended for the installation on the vessel, subject to inspection shall comply with the applicable Rule requirements and have been supervised during construction in accordance with the Rules, and that they have appropriate Certificates, unless otherwise provided as a result of special arrangements agreed upon with the Register;
3. that satisfactory functional testing and trials have been carried out to the extent and in the manner prescribed by the approved Testing Program and the requirements of the Rules;
4. that the welded parts are produced by qualified and certified welders and the work carried out (including fabrication tolerances) is in compliance with the applicable Rules, current engineering standards and good shipbuilding practice;

**NOTE:** IACS Rec No. 47 - Shipbuilding and Repair Quality Standard, SARQS should be taken as an example of an acceptable standard. Welding on steel or aluminium structures shall be performed by qualified and certified welders using approved welding consumables and according to approved welding procedures (see the Rules, Part 26 – Welding).

5. that only type-tested or type-approved appliances and equipment are used, in accordance with the applicable requirements of the Rules, when individual certificates are not required;
6. that the class Certificate, record books, operating manuals and other instructions and documentation specified in the Rules, relevant to the Certificate of class, have been placed on board the vessel.

3.4.7 If subsequent information gives objective evidence that the works performed are not in compliance with requirements stated above, the Register reserves the right to revoke survey during construction.

3.4.8 Notwithstanding above stated, the Register reserves the right to extend the scope of a survey or inspections during newbuilding supervision in case of suspected non-compliance with the requirements of the Rules.
3.5 Materials and products

3.5.1 For the purpose of survey during construction, all materials, machinery, auxiliary installations, equipment, etc., which are covered by the classification and to be installed on board vessel shall be new, of good quality and free from defects, and where applicable shall be surveyed during production at the premises of the manufacturer, what in certain cases requires approval of the technical documentation also.

The steel shall be manufactured by an approved process at an approved works. Alternatively, tests will be required to demonstrate the suitability of the steel.

NOTE: It is the duty of the Shipyard to ensure that all materials, products and equipment to be installed on board vessel during construction are supplied with appropriate certificates, when and if so required by the Rules.

3.5.2 Second hand materials, machinery, auxiliary installation, equipment, etc., may be used subject to approval of the Register on a case by case basis, but limited to class related items only, under presumption that such second hand items are complying with the applicable Rules for newbuilding, including statutory requirements where relevant, and provided that the Owner has given a written acceptance.

3.6 Defects or deficiencies originated during construction and their repairs

3.6.1 The Register may, at any time, reject items found to be defective or contrary to rule requirements or require supplementary inspections and tests and/or modifications, notwithstanding any previous certificates issued.

All repairs are subject to the preliminary agreement of the Register. When the limits of tolerance for defects are specified in the Rules concerned or by the manufacturer, they shall be taken into account for repairs.

3.6.2 It is incumbent upon the Shipyard to notify the Register of any defects noted during the construction of the vessel and/or of any item not complying with the applicable requirements or in any case unsatisfactory.

Proposals regarding remedial actions intended to be adopted to eliminate such defects or unsatisfactory items shall be submitted to the Register and, if accepted, carried out to the Surveyor’s satisfaction.

3.6.3 Guidance to general welding repair work is given in IACS Rec No. 47 - Shipbuilding and Repair Quality Standard, SARQS, Part A.

3.7 Testing program, trials and reporting

3.7.1 During construction of the vessel, the Shipyard shall develop a Testing Program (functional testing program) to the satisfaction of the Register. This Program shall include testing during harbour and trials.

This Program shall specify systems, arrangements and equipment which shall be tested together with testing procedures. Such tests shall give evidence as to satisfactory operation and performance in accordance with the Rules.
4 INITIAL CLASS ENTRY SURVEY OF EXISTING VESSEL - ADMISSION TO CLASS

4.1 General

4.1.1 This Section of the Rules is applicable to all existing vessels of whatever type, age or navigation area, self-propelled or not and not originally being built under supervision of the Register, irrespective of their size or navigation area, to be admitted to Register class for the first time.

For that purpose the Register shall perform Initial class entry survey in order to verify whether the vessel is eligible to be classed on the basis of the Rules.

4.1.2 During Initial class entry survey of the existing vessel, which has not been surveyed during construction by the Register, the following should be considered:

.1 requirements of the Rules of the Classification Society which supervised the vessel during construction (if applicable);

.2 requirements of the Rules of the losing Classification Society (if applicable);

.3 requirements of the Rules which are related to existing vessels.

NOTE: Apart from the classification requirements, during Initial class entry survey of the existing vessel, the Register may also verify compliance of the vessel with relevant statutory requirements, if so authorized by the Flag Administration / Authorities.

4.1.3 Initial class entry survey, or (classification after construction of an existing vessel) is a complete inspection of a vessel before it is put into service, comprising inspection of all the items relating to the Certificate of class to ensure that the relevant requirements are complied with, and that these items are satisfactory for the service and navigation area for which the vessel is intended.

4.1.4 Request for the classification of the existing vessel shall be addressed to the Register in writing, using the form provided by the Register. It shall be accompanied with the information on the previous class status and class term, as well as about any conditions of class or recommendations imposed by the previous (losing) Classification Society.

4.1.5 Request shall be processed depending on whether the vessel:

.1 is (has been) classed with a recognized Classification Society;

.2 is (has been) classed with non-recognised Classification Society;

.3 has never been classed.

For that purpose the Register shall perform Initial class entry survey in order to verify whether the vessel is eligible to be classed on the basis of the Rules.

4.1.6 Initial class entry survey consists of:

.1 an examination of the vessel’s particulars related to the structure, machinery and equipment installed on the vessel to verify compliance with the requirements of the Rules, relevant to the Certificate of class;

.2 an inspection of the structure, machinery and equipment to ensure that they have been properly maintained and in satisfactory condition and are fit for the service for which the vessel is intended, and that there have been no unauthorised changes;

.3 a check that the Certificate of class, record books, operating manuals and other instructions and the documentation specified in the requirements of the Rules, relevant to the Certificate of class have been placed on board the vessel.

4.2 Vessels classed by the recognized Classification Society

4.2.1 In the case of existing vessel classed by the recognised Classification Society, the scope of Initial class entry survey shall be based on the age of the vessel and the updated current class status of the losing Classification Society, as provided by the Owner.

However, as a minimum, Initial class entry survey shall be held within the scope of an Intermediate Survey according to the present Rules, Chapter III - Surveys.

4.2.2 The Owner shall submit to the Register technical documentation at the extent stated in 4.4.

4.2.2.1 For vessels with expired or extended Certificate of class issued by the recognised Classification Society, the inspection of the structure, machinery and equipment including tests when necessary, shall be carried out in scope not less than those required at the Renewal survey of a vessel of the same age and type.

4.3 Vessels classed with non-recognized Classification Society or vessels that have never been classed

4.3.1 In the case of existing vessel not being classed with the recognised Classification Society or in the case of vessels that have never been classed, Initial class entry survey shall be carried within the scope of full Renewal survey.

4.3.2 Prior commencing the survey the Owner shall submit to the Register for approval technical documentation at the extent stated in 4.4.

Consequently, during the survey stipulated in 4.2.1, on board assessment of compliance with the submitted technical documentation (including trials and/or functional testing when and if deemed necessary) shall be carried out.

All assessments shall include workmanship, material and scantling survey.

Dispensation to the scope of surveys to be carried out on board vessel for the purpose of assessment of compliance of the vessel with submitted drawings and workmanship, material and scantling survey, may be given in the cases when the vessel has been previously classed with the recognised Classification Society.

4.3.3 Where appropriate within reasonable limits, a proven service record of satisfactory performance during a period of adequate length may be used as a criterion of equivalence (as a rule this period of adequate length should in...
Chapter II - CLASSIFICATION

no case be less than five years). Special consideration will be given to vessels of recent construction.

4.4 Technical documentation to be submitted

4.4.1 As a rule, the following documentation, as far as applicable, updated to present status, shall be submitted to the Register, in order to be checked for compliance with applicable requirements of the Rules:

1 Main data and vessel particulars: type of the vessel, current flag, year of build, shipyard, data on major conversions / alterations, hull dimensions, particulars of main engines (type and data including year of build and manufacturer) and auxiliary machinery essential for operational safety.

2 Documentation and particulars related to hull:
   - Main plans: general arrangement, capacity plan, hydrostatic curves, loading manual (where required), documentation related to stability (freeboard; trim and stability book and damage stability calculation, if applicable).
   - Steel plans: midship section, vessel’s body lines with offset tables, scantling plan, decks, shell expansion, transverse bulkheads, transverse and longitudinal sections, rudder and rudder stock, hatch covers, stem and stern frame, anchor equipment, engine and boiler foundations.

3 Documentation and particulars related to machinery and electrical equipment:
   - Machinery: machinery arrangement and layout, particulars of the steering gear and the windlasses, intermediate, thrust and screw shafts, torsional vibration calculations for vessels less than 2 (two) years old, propeller, propulsion gears and clutch systems (or manufacturer make, model and rating information), starting air receivers, main and auxiliary boilers and related systems, steam piping, bilge and ballast piping diagram, cooling water and lubricating oil piping diagrams, fuel oil and starting air piping diagrams, air and sounding piping diagrams, pumping arrangements at the forward and after ends, drainage piping of cofferdams and pump rooms, and general arrangements of cargo piping in tanks on decks (for tankers), steering gear systems piping and arrangements, steering gear manufacturer including make and model information, plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting (or manufacturer make, model and rating information) for vessels intended to navigate in ice.
   - Electrical equipment: electrical installations and systems with wiring diagrams, automatic/remote control systems, the safety arrangements, instrument and alarm list, fire alarm system, list of automatic safety functions (e.g. slowdowns, shutdowns, etc.).

4.4.2 The Register reserves the right to ask for additional documentation which considers necessary on a case by case basis. For installations or equipment covered by specific service and/or class notation, the Register will determine the scope of additional documentation to be submitted.

4.4.3 In addition to 4.4.2 the Register may base its judgement upon documentation such as certificates issued or accepted by the losing Classification Society, if any, and statutory certificates.

4.4.4 Submittal and reviewing of the documentation by the Register with satisfactory results is in principle considered as a prerequisite for issuing Certificate of class. Requirements stated in 3.3 are applicable.

However, having made a good faith effort to obtain the information, or if it proves impracticable to acquire certain documents, equivalent / alternative technical data should be provided to the Register prior issuing Certificate of class or additional surveys or investigations including specific measurements may have to be carried out in order to obtain necessary information.

4.4.5 Alternative technical data may be accepted by the Register in lieu of specific items of the listed documentation not available at the time of the transfer of class.

4.4.6 Where the vessels holds the valid Certificate of class issued by another recognised Classification Society, with sufficient proof furnished regarding the present class status, the Register may dispense with parts of the examination of drawings and computations.

4.5 Reports and certificates

4.5.1 Upon satisfactory completion of Initial class entry survey a Certificate of class will be issued and class term defined.

4.5.2 Regarding Surveyor’s reports and certificates, the provisions of 3.4 apply also to the classification of existing vessels. Once a vessel and the relevant equipment have been classed with the Register, the Rules in force for surveys as well as procedures applicable to vessels constructed under supervision of Register shall apply.
III SURVEYS

1 GENERAL REQUIREMENTS

1.1 Surveys for maintenance of class

1.1.1 The requirements of this Chapter are applicable to hull, hull equipment, machinery and electrical installations as well as special equipment and installations on existing vessels subjected to regular periodical and where necessary non-periodical surveys which have to be performed by the Register for maintenance of class. Those surveys are carried out at the intervals and under the conditions laid down in this Chapter.

If for some obvious reason, e.g. a temporary out of service condition of certain equipment, parts included in the classification cannot be surveyed, this will be noted in the Survey Statement or Certificate.

1.1.2 The periodical surveys may be as follows:

1.1.2.1 Annual Survey (see Section 2);
1.1.2.2 Intermediate Survey (see Section 3);
1.1.2.3 Class Renewal Survey (see Section 4);
1.1.2.4 Bottom Survey (either survey in dry condition or In-water survey) (see Section 5);
1.1.2.5 Propeller shaft survey (see 4.6);
1.1.2.6 Boiler Survey (see Section 6);
1.1.2.7 Surveys for the maintenance of additional Characters of class or descriptive notes, if applicable.

The different types of periodical surveys are summarized in Table 1.1-1.

1.1.3 If there are no specific survey requirements for vessels with additional Characters of class assigned to a vessel, the equipment and/or arrangements related to these additional Characters of class shall be examined, as applicable, to the Surveyor’s satisfaction at each Intermediate or Class Renewal Survey.

1.1.4 The surveys shall be carried out according to the related requirements in order to confirm that the hull, hull equipment, machinery and electrical installations as well as special equipment and installations comply with the applicable Rules and will remain in satisfactory condition.

If the conditions for the maintenance of type notations and additional Characters of class are not complied with, the type notation and/or the additional Characters of class as appropriate will be suspended and/or withdrawn in accordance with the applicable Rules (see the present Rules, Chapter II, Section 2).

NOTE: It is understood that requirements for surveys apply to those items that are required according to the Rules or, even if not required, are fitted on board.

Each specific case not covered by the Rules is considered separately in extent as deemed necessary by the Register.

1.1.5 The Register may extend the scope of the provisions in this Chapter, which set forth the technical requirements for surveys, whenever and so far as considered necessary, or modify them in the case of special vessels or systems.

The extent of any survey also depends upon the condition of the vessel and its equipment. Should the Surveyor have serious doubts as to the maintenance or condition of the vessel or its equipment, or be advised of any deficiency or damage which may affect the class, then further examination and testing may be conducted as considered necessary.

1.1.6 Apart from classification requirements, if surveys are requested by the Owner on account of applicable National and International Regulations which may also contain requirements which are outside classification as defined in these Rules, such as European Directives, the Regulations of the Central Commission for the Navigation of the Rhine (CCNR) and the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN), special attention is drawn to the necessity to comply with.

The Register may carry out above surveys acting on behalf of the Authorities concerned, based on the respective provisions.

1.1.7 If Flag State Regulations are applicable which impose inspection intervals deviating from the class related intervals, the intervals will be harmonized in order to reduce the number of single surveys, where possible.

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

Table 1.1-1
List of periodical surveys

<table>
<thead>
<tr>
<th>Type of survey</th>
<th>Reference to scope of survey</th>
<th>Applicable to type notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Survey</td>
<td>Section 2</td>
<td>vessels assigned with the descriptive note Annual survey</td>
</tr>
<tr>
<td>Intermediate Survey</td>
<td>Section 3</td>
<td>Tanker, Passenger vessel, Tug, Pusher, Dredger, Hopper barge, Hopper dredger, Split hopper barge</td>
</tr>
<tr>
<td>Class Renewal Survey</td>
<td>Section 4</td>
<td>all types of vessels</td>
</tr>
<tr>
<td>Bottom Survey – Docking Survey</td>
<td>5.2, 5.3</td>
<td>all types of vessels, as applicable</td>
</tr>
<tr>
<td>Bottom Survey – In-Water Survey</td>
<td>5.4</td>
<td></td>
</tr>
<tr>
<td>Propeller shaft – complete</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>Propeller shaft – modified</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>Installations under pressure</td>
<td>Section 6</td>
<td></td>
</tr>
</tbody>
</table>
1.1.8 The Register reserves the right to perform occasional surveys of the hull, machinery and electrical installations as well as special equipment and installations on existing vessels in the event that the Register believes that its Rules are not being complied with.

In the event of significant damage or defect affecting any vessel classed by Register, the Register reserves the right to perform occasional surveys of the hull, equipment, machinery and electrical installations as well as special equipment and installations on other similar vessel classed by the Register.

1.2 Definitions

1.2.1 Anniversary date

Anniversary date is the day of the month of each year in the Class term which corresponds to the expiry date of the Class term.

1.2.2 Ballast tank

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

A combined Cargo/Ballast tank is a tank which is used for the carriage of cargo or ballast water as a routine part of the vessel’s operation and will be treated as a ballast tank when substantial corrosion has been found in such tank, (see 1.2.19).

1.2.3 Cargo length area

Cargo length area is that part of the vessel which contains all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces (or for vessels carrying liquid cargo in bulk all cargo tanks, slop tanks, cargo/ballast pump rooms, cofferdams, ballast tanks and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the vessel over the above mentioned spaces).

1.2.4 Class term

Class term is the period of validity of the Certificate of class, i.e. time interval between two Class Renewal Surveys (time interval may be up to 5 (five) years and depends upon the navigation area, building material, general condition, age, etc.).

1.2.5 Close-up survey

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

1.2.6 Coating condition

Coating condition is defined as follows:

.1 GOOD – condition with only minor spot rusting affecting not more than 20% of areas under consideration (e.g. on a deck transverse, side transverse, on the total area of plating and stiffeners on the longitudinal structure between these components, etc.);

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

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

1.2.7 Conditions of class/recommendations

Any defect and/or deficiency affecting the class, and which has to be dealt with within a limited period of time, is indicated as a condition of class/recommendation. A condition of class/recommendation is pending until it is settled to the satisfaction of the Register, and where is not dealt with by the due date imposed by the Register, the condition of class/recommendation is considered overdue.

Overdue condition of class/ recommendation, may lead to suspension of class (see the present Rules, Chapter II, 2.1).

1.2.8 Corrosion prevention system

Corrosion prevention system is normally considered a full hard protective coating.

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

1.2.9 Critical structural areas

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

1.2.10 Exceptional circumstances

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

1.2.11 Memoranda

Any information deemed useful for the vessel Owner/managing Company and CRS Surveyors related to planning / preparation for future surveys as well as deficiencies which do not affect the maintenance of class, shall be indicated as memoranda. Memoranda shall not be regarded as conditions of class.

1.2.12 Overall survey

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

1.2.13 Overdue survey

Overdue survey is concerned in case survey has not been completed by its time limit. Each periodical survey is assigned a limit date specified by the relevant requirements of the Rules by which it shall be completed.
1.2.14 Pitting corrosion

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

1.2.15 Prompt and thorough repair

Prompt and Thorough Repair refers to a permanent repair completed at the time of survey to the satisfaction of the Surveyor, thereby removing the need for the imposition of any associated condition of class.

1.2.16 Representative tanks or spaces

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

1.2.17 Spaces

Spaces refer to separate compartments such as holds and tanks, cofferdams and void spaces bounding cargo holds, decks and the outer hull.

1.2.18 Special consideration

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

1.2.19 Substantial corrosion

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

1.2.20 Survey time window

Survey time window, or simpler, time window, is the fixed period during which Annual and Intermediate Surveys shall be carried out.

1.2.21 Suspect areas

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

1.2.22 Transverse section

Transverse section includes all longitudinal members contributing to longitudinal strength, such as plating, longitudinals and girders at the deck, side shell, bottom, inner bottom, inner side, hopper side, top wing side and longitudinal bulkhead, where fitted. For transversely framed vessels, a transverse section includes adjacent frames and their end connections in way of transverse sections.

1.3 Change of periodicity and postponement of surveys

1.3.1 The Register reserves the right, after due consideration, to change the periodicity, postpone or advance surveys, taking into account particular circumstances.

1.3.2 If it is inconvenient for an Owner to fulfil all the requirements of a Class Renewal Survey at its due date and on Owner’s special request and following surveys of hull and machinery systems afloat, the Register may within two periods of class, extend the class by no more than 12 months in total, provided that the surveys, at least in the scope of an Intermediate Survey, show that hull, machinery and electrical installations as well as special equipment and installations covered by class are in unobjectionable condition.

The class extension survey shall be performed within one month before expiry of the class Certificate.

1.3.3 In the case of extension of Class term \( C_t \) for \( \Delta t \), the next Class term \( C_{t+1} \) will commence the following day after which the extension period expires, see Figure 1.3-1.

1.3.4 The total period of extension \( \Delta t = \Delta t_1 + \Delta t_2 \) shall not be, in any case, longer than one year after the original limit date of the Class Renewal Survey.

In the case of Annual or Intermediate Surveys, no postponement is granted. The surveys shall be completed within their prescribed windows.

1.3.5 In the case of all other periodical surveys and conditions of class/recommendations, extension or postponement may be granted, provided there is sufficient technical justification for such an extension or postponement.

1.3.6 Under exceptional circumstances (see 1.2.10) the Register may grant an extension not exceeding 3 (three) months to allow for completion of the Class Renewal Survey provided that the vessel is attended and that attending Surveyor(s) so recommends after the following has been carried out:

1.1 re-examination of Condition of class;

2.2 progression of the Class Renewal Survey as far as practicable

See also the present Rules, Chapter I, 2.11.

NOTE: Link between the anniversary dates, the Class Renewal Survey (when carried out according to the normal system), and the Intermediate Surveys is given in Figure 1.3-1, as well, considering Class term \( C_t = 5 \).
1.4 Procedure of survey

1.4.1 Surveys are performed on the basis of a request submitted by the Owner or the Management Company. The Owner/Management Company is responsible for the organisation of the survey in accordance with the terms stated in the Rules.

1.4.2 The Owner/Management Company shall provide Conditions for survey as specified in 1.5.

1.4.3 As part of the vessel’s survey, the Surveyor will:

.1 carry out an overall examination of the parts of the vessel covered by the Rules;
.2 overall examine the structure required by the Rules;
.3 randomly check selected items covered by the Rule requirements;
.4 attend tests and trials where applicable and deemed necessary.

1.4.4 When a survey results in the identification of significant corrosion, structural defects or damage to hull, machinery and/or any piece of its equipment which, in the opinion of the Surveyor, affect the vessel's class, remedial measures may be required to be implemented before the vessel continues in service.

1.4.5 The Register's survey requirements cannot be considered as a substitute for specification and acceptance of repairs and maintenance, which remain the responsibility of the Owner.

1.5 Preparations, conditions and documentation for survey, confirmation of class

1.5.1 The Owner/Management Company in cooperation with the Register shall agree surveys required for maintenance of class in due time.

The acting Surveyor will be appointed by Register. However, the Owner is free to have any findings of surveys and decisions resulting therefrom, which deem to be doubtful, checked by other Register’s Surveyors upon special request to Register.

The establishment of proper preparation and the close co-operation between the attending Surveyor(s) and the Owner’s representatives on board prior to and during the survey are an essential part in the safe and efficient conduct of the survey.

1.5.2 Survey planning meeting shall be held prior to commencement of the Intermediate or Class Renewal Survey. For details, see 1.6.

1.5.3 Applicable safety procedures and responsibilities shall be discussed and agreed to ensure that the survey is carried out under controlled conditions. Safety meetings shall be held prior to entering the tank or space and regularly during the survey on board.

1.5.4 Shipyards, Manufacturers, Owners, etc. shall provide free and safe access to the vessel and/or to workshops and necessary facilities for the Surveyors in order to perform his duties.

Cargo holds, tanks and all other spaces and areas shall be safe for access, cleared, cleaned, gas free and properly ventilated. Prior to entering a tank, void or enclosed space, it shall be verified that the atmosphere in the tank is free from hazardous gas and contains sufficient oxygen. The bilges and limbers all fore and aft shall be cleaned and prepared for survey.

Sufficient illumination shall be provided for tanks and spaces which have to be clean and free from water, scale, dirt, oil residues etc. to reveal corrosion, deformation, fractures, damages or other structural deterioration. However, those areas of structure whose renewal has already been decided by the Owner need only to be cleaned and descaled to the extent necessary to determine the limits of areas to be renewed.

For overall survey including close up survey of vessel’s internal structure, means shall be provided to enable the Surveyor to examine the hull structure in a safe and

Figure 1.3-1
Periodicity and postponement of surveys
practical way. Adapted rescue and safety equipment shall be available.

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

1.5.5 The class Certificate and other documents related to classification and carried on board shall be made available to the Surveyor.

1.5.6 The Register reserves the right to extend the scope of a survey and/or inspection for given reasons, e.g. in case of suspected damage or other negative experience gained, possibly on board of similar vessels or vessels with similar components.

1.5.7 The Register will inform the Owner about the status of class, indicating the last recognised surveys and the next due dates. However, in principle it remains the responsibility of the Owner or Management Company to comply with the class conditions and to observe the dates for the prescribed surveys.

Upon request, the Register may agree to testing, monitoring and analysis procedures as a supplement to or equivalent substitute for conventional survey methods.

1.5.8 The records of each survey, as well as any requirements upon which maintenance of class has been made conditional, will be entered into the respective Survey Statement or Certificate. By his signature in the certificate and other documents, the Surveyor certifies what he himself has seen and checked during the particular survey. The Register reserves the right to modify the endorsements made by the Surveyors.

The dates of the surveys will be indicated in the Register Book.

The class status may be confirmed in writing by a separate certificate or statement issued by the Register, if so requested.

NOTE: If defects are repaired temporarily only, or if the Surveyor does not consider immediate repair or replacement necessary, the vessel’s class may be confirmed for a limited period. Cancellation of such limitations will have to be indicated in the Survey Statement or Certificate.

1.6 Survey planning meeting

1.6.1 Proper preparation and close co-operation between the attending Surveyor(s) and the Owner’s representatives on board prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey, on board safety meetings shall be held regularly.

1.6.2 Prior to the commencement of the class Renewal and Intermediate Survey a survey planning meeting shall be held between the attending Surveyor(s), the Owner’s Representative in attendance and the thickness measurement company representative, where involved, and the master of the vessel or an appropriately qualified representative appointed by the master or Company for the purpose to ascertain that all the arrangements envisaged in the survey programme are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out.

1.6.3 The following is an indicative list of items that shall be addressed in the meeting:

1. schedule of the vessel (i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.);
2. provisions and arrangements for thickness measurements (i.e. access, cleaning/descaling, illumination, ventilation, personal safety);
3. extent of the thickness measurements;
4. acceptance criteria (refer to the list of minimum thicknesses);
5. extent of close-up survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion;
6. execution of thickness measurements;
7. taking representative readings in general and where uneven corrosion/pitting is found;
8. mapping of areas of substantial corrosion; and
9. communication between attending Surveyor(s), the thickness measurement company operator(s) and Owner representative(s) concerning findings.
2 ANNUAL SURVEY

2.1 General

2.1.1 An Annual survey is a general inspection of items covered by the Rules, and shall be held within three months before or after each anniversary date of the Certificate of class.

An Annual survey should enable the Register to verify that the condition of hull, hull equipment, machinery installations and equipment, the fire protection arrangements, so far as necessary and practicable in order to be satisfied as to their general condition and is being maintained in accordance with the Rules.

2.1.2 Annual surveys are required only for vessels assigned with descriptive note Annual survey as stated in the present Rules, Chapter 1, 3.7.13.

The Register may require a vessel to be submitted to an Annual survey, depending on its type notation, its range of navigation and frequency of operations in restricted maritime stretches of water or lakes, and its age.

As a rule, Annual survey is required when the vessel is granted with a range of navigation IWW-1.2 or IWW-2.0 or operated more than 40% of the time in salt waters.

2.1.3 Depending on the findings of previous surveys, the Register may also require an Annual survey, on vessels without descriptive note Annual survey (e.g. where the coating in ballast tanks is found to be in POOR condition (see 1.2.6), maintenance of class shall be subject to the tanks in question being examined at annual intervals, and thickness measurements carried out as considered necessary).

2.2 Hull and hull equipment – scope of survey

2.2.1 The survey of the hull shall consist of a general examination for the purpose of ensuring, as far as practicable, that the hull, hull equipment, foundations and their substructure of equipment, closing appliances, equipment and related piping are maintained in a satisfactory condition.

If applicable, ballast tanks, storage and engine rooms shall be surveyed at random, depending on the vessel type, age and general condition of the vessel. If damages or excessive wastage affecting the class are suspected, the Surveyor is entitled to carry out further investigations as well as thickness measurements, if required.

If coating is partly or totally renewed, only approved coating is applicable in case of a repair. The whole working procedure including the surface preparation has to be documented.

2.2.2 The rudder and manoeuvring arrangement and the anchor equipment shall be checked for visible damages. For the related machinery and for operability, see 2.3.

2.2.3 In addition to above, the Surveyor shall be satisfied as to the efficient condition of the following:

1. hatches and covers, bulhkeads and hull doors, bow, side and stern doors including all hinges and the pertinent hydraulic cylinders in way of their securing points and all securing elements of the locking devices and stoppers,

2. all openings on the vessel’s outer shell below the freeboard deck regarding structural integrity and their closing appliances as well as their tightness and operability;

3. the foundations and their substructure of special equipment, superstructure, deck houses and the openings therein together with all closing appliances and wheelhouse elevation arrangements.

2.2.4 If damages or excessive wastage affecting the class are suspected, the Surveyor is entitled to carry out further investigations, if required (i.e. tightness test of hatch covers, crack tests of repair welding and of main joining weld in highly stressed areas and their interfacial areas both on the hull and on the doors, in way of the hinges for bow, side and stern doors, in highly stressed areas of the locking devices and their stoppers, as well as thickness measurements, etc.).

Various non-destructive methods may be used during investigations of equipment or installations, such as radiography (X or gamma rays) and ultrasonic test or, for crack detection, magnetic particle test or dye penetrant test shall be employed, and a test protocol shall be prepared.

2.3 Machinery and electrical installation/equipment – scope of survey

2.3.1 During Annual survey the Surveyor shall, in general, check and inspect the machinery and electrical equipment, with special attention being given to the following:

1. general examination of machinery and boiler spaces with particular regard to the main propulsion system and thruster installation where fitted, auxiliary machinery arrangements and piping systems used for essential services on board.

Particular attention shall be given to the existence of any danger to persons on board due to moving parts, hot surfaces as well as fire and explosion hazards. Emergency exits and escape routes shall be checked to ensure that they are free of obstruction;

2. an external examination of boilers and pressure vessels including their safety devices, piping, fittings, insulation, gauges, foundation and fastening arrangement, controls, relieving, high pressure and steam escape piping.

For thermal oil heaters, a functional test during operation shall be carried out, during detection of leakages, condition of the insulation, operation of indication, control and safety devices and condition of remote controls for shut-off and discharge valves shall be checked.

A satisfactory analysis of the quality of oil shall be made available to the Surveyor.

For exhaust gas thermal oil heaters, in addition to above a visual examination and a tightness testing to the working pressure of the heater tubes shall be carried out.

For details, see Section 6;

4 inspection and operation test of main and auxiliary steering gear, including their associated equipment and control systems;
.5 inspection and operation test of communication between the navigation bridge and the machinery space and confirmation that the rudder angle indicator on the bridge is in working order, as well;

.6 inspection of the bilge wells and bilge pumping systems including remote control actuators and bilge filling level monitors. All bilge pumps shall be tested under operating conditions;

.7 inspection of electrical equipment and installations including main and emergency sources of power, bridge control of propulsion machinery and related arrangements, electric motors, switchboards, switchgears, cables and other essential electrical installations, including their earthing and operating condition;

.8 a general examination of the explosion-proof installations where applicable.

NOTE: If the vessel is equipped with a refrigerating plant, the Annual survey consists of the external examination of pressure vessels and refrigerant piping.

For refrigerating machinery spaces using ammonia as refrigerant, external examination of bilge system, waterspraying fire-extinguishing system, gas detection system, ventilation system and electrical equipment shall be carried out.

2.4 Fire protection

2.4.1 During Annual survey the Surveyor shall inspect and/or test the following items or systems, where applicable, in order to confirm they are in good order:

.1 fire control plans are properly posted;

.2 examination, so far as is practicable, of the remote controls, quick-closing/stopping devices of valves, ventilators, pumps, means of cutting off power supply etc.;

.3 fire pumps, fire main, hydrants, including flexible fire hoses and nozzles. It is also to be confirmed that fire main valves are distinguishably marked. Testing of flexible fire hoses and nozzles shall be the Surveyor’s discretion;

.4 sprinkler system, including water mist sprinkler system, gas, foam, dry powder fire extinguishing systems and any other fixed fire extinguishing systems. These systems shall be regularly checked every 2 years by approved service firm. All flexible hose assemblies shall be subjected to a visual check. All flexible hose assemblies made of synthetic rubber shall be replaced according to manufacturer’s instructions. The installation, maintenance, monitoring and documentation of fixed fire extinguishing systems according to Statutory Regulations, for the engine room, pump room and all spaces containing essential equipment, such as switchboards, compressors, etc., and for the refrigeration equipment, if any, shall only be performed by approved service firm.

Where fixed foam fire extinguishing system is used, report on foam concentrates from foam manufacturer or independent laboratory shall be checked (foam concentrates should be subjected to periodical control after the period of three years after filling into the system, and after that every year). The foam concentrate for the portable foam applicators shall be renewed on the occasion of each class renewal. More extensive regulations of the Flag Administration / Authorities regarding other inspection intervals/performance of the tests should be observed. Records of the inspections and maintenance of above systems shall be kept on board;

.5 portable fire extinguishers, mobile fire extinguishers, including portable foam application units. All portable and mobile fire extinguishers, including portable foam application units shall be checked for proper location and condition. Above equipment shall be checked every two years by approved service firm. An inspection label shall be affixed to the each extinguisher, showing the date of the inspection and the name and stamp/seal of approved service firm. Records of the inspections and maintenance of above equipment shall be kept on board;

.6 water and/or foam drencher system;

.7 fire detection and alarm systems, fire dampers, fire closures, etc.;

.8 fireman’s outfits, if required.

2.5 Hull and hull equipment survey - wooden vessels and fibre reinforced plastic vessels

2.5.1 Annual survey shall be carried out in order to verify that the hull and its equipment are in satisfactory and efficient condition, and that no unapproved alternations have been made. The following shall be dealt with so far as is practicable:

.1 freeboard marks shall be checked;

.2 the outside shell above the water-line shall be examined, with particular attention to the butts of sheer strake and shell planking;

.3 weather decks shall be examined with particular attention to the butts of waterways, inner waterways and planking;

.4 hatchways and cargo hatch covers including closing and securing appliances as well as other deck openings with closing appliances;

.5 guard rails, bulwarks, freeing ports, mooring equipment and other deck fittings shall be examined;

.6 masts and rigging (steady and loose gear) including lightning conductors shall be examined;

.7 towline, hawser and warps, and stream anchor, wire rope (or chain) if required shall be examined;

.8 the windlass shall be examined externally and in working condition;

.9 it shall be verified that the equipment of anchors and chain cables is complete, and chain cables shall be examined as far as accessible;

.10 main and auxiliary steering arrangements shall be checked, with particular attention to the rod and chain gear if fitted;

.11 the deck outfit, tools and gear shall be verified.
.12 enclosed spaces, as far as accessible at the time of the survey shall be examined;
.13 portions of the inner planking and ceiling shall be removed for detailed examination and testing of timbers by axe, chisel or other suitable tool if considered necessary by the Surveyor;
.14 for fibre-reinforced plastic vessels survey of the connection between hull and superstructure shall be carried out, particularly when hull and superstructure are not built from the same material. Additionally the hull survey shall be performed by sound pattern hammer testing.

3 INTERMEDIATE SURVEY

3.1 General

3.1.1 An Intermediate Survey is an inspection of the items covered by the Rules and should enable the Register to verify that the vessel is being properly maintained taking into account the purpose of the vessel.

3.1.2 An Intermediate Survey shall be held concurrently with statutory Annual or Intermediate Surveys whenever practicable. The Intermediate Survey becomes due at half of the nominal time interval between two Class Renewal Surveys (every 0.5\(\text{Ct}\) years) or, at most, in the case of \(\text{Ct}=5\) years, at 2.5 years after the commencement of the term of class and has to be carried out between six month before to six month after this date.

The requirements apply to inland navigation vessels in general. If applicable, those items which are additional to the requirements of the Annual survey may be surveyed either at or between the second or third Annual survey. Additional requirements may have to be observed for particular vessel types, due to request of the Owner or in connection with manufacturer's recommendations for special equipment.

More extensive Regulations of the Flag Administration, where the vessel is registered, shall be observed.

The Intermediate Survey is not applicable to vessels with character of class and compliance with the Rules 100A0.

3.1.3 The Intermediate Survey shall include examination and checks on a sufficiently extensive part of the structure to show that the structures of the vessel are in satisfactory condition so that the vessel is expected to operate until the end of the current Class term, provided that the vessel is properly maintained and other surveys for maintenance of class are duly carried out during this period.

A survey planning meeting shall be held prior to the commencement of the survey in accordance with 1.6.

3.1.4 Intermediate Surveys shall include all the inspections and checks required for possible annual surveys. Additionally, the requirements stated in 3.2 to 3.7 shall be observed, as applicable.

3.2 Hull and hull equipment

3.2.1 The vessel shall be brought into light condition for internal and external examination afloat. The Surveyor shall check that no alternations have been made to the hull or superstructures that would affect the position of the load line.

Should examination afloat give rise to doubts as to the condition of the underwater structure or of tanks and cofferdam spaces, it may be necessary for Surveyors to require the vessel to be dry docked or placed on a slipway for a more detailed inspection.

3.2.2 The vessel shall be examined in dry-dock or on slipway in the extent deemed appropriate by the attending Surveyor in following cases:
.1 the vessel's shell is riveted below the light waterline,
If coating has to be partly or completely renewed, only approved coating is applicable. The entire working procedure including the surface preparation has to be documented.

3.2.8 Compartments and rooms normally not accessible, or accessible only after special preparations, may be required to be opened for inspection, depending on the vessel's age and available information about service conditions.

3.2.9 The collision and other watertight bulkheads including watertight bulkhead penetrations shall be examined together with an examination and testing (locally and remotely) of the watertight doors in watertight bulkheads, as far as accessible and practicable.

3.2.10 The rudder(s) and manoeuvring arrangement, bow thruster(s), main and auxiliary steering arrangements shall be examined and tested in operation, including their associated equipment and control systems, together with alarms and recharging arrangements for hydraulic power operated steering gears (see 3.3).

3.2.11 Anchoring and mooring equipment shall be examined so far as it is practicable.

3.3 Machinery and electrical equipment

During Intermediate Survey the Surveyor shall, in general, check and inspect the machinery and electrical equipment, with special attention being given to the following surveys and operational checks:

1. general examination of machinery and boiler spaces with particular regard to the main propulsion system and thruster installation, auxiliary machinery arrangements and piping systems used for essential services on board. Particular attention shall be given to the existence of any danger to persons on board due to moving parts, hot surfaces as well as fire and explosion hazards. Emergency exits and escape routes shall be checked to ensure that they are free of obstruction;

2. external examination of boilers and pressure vessels including their safety devices, piping, fittings, insulation, gauges, foundation and fastening arrangement, controls, relieving, high pressure and steam escape piping shall be carried out. For details, see Section 6;

3. examination, so far as is practicable, of the remote controls, quick-closing/stopping devices of valves, ventilators, pumps, etc.;

4. inspection and operation test of main and auxiliary steering gear, including their associated equipment and control systems;

5. inspection and operation test of communication between the navigation bridge and the machinery space;

6. inspection of the bilge pumping systems, including remote control actuators and bilge filling level monitors. All bilge pumps shall be tested under operating conditions;

7. inspection of electrical equipment and installations including main and emergency sources of power, bridge control of propulsion machinery and related arrangements, electric motors, switchboards, switchgears, cables and other essential electrical installations, including their earthing and operating condition.
3.4 Fire protection

3.4.1 General

During Intermediate Survey the Surveyor shall inspect and/or test the following items or systems, where applicable:

1. fire pumps, fire main, hydrants, hoses and nozzles;
2. sprinkler system, including water mist sprinkler system, gas, foam and dry powder fire extinguishing systems and any other fixed fire extinguishing systems provided;
3. portable fire extinguishers, mobile fire extinguishers, including portable foam application units;
4. water and/or foam drencher system;
5. fire detection and alarm systems, quick-closing fuel valves, fire dampers, fire closures, etc.;
6. emergency stops for boiler forced draft fans, fuel transfer pumps, fuel oil purifiers, ventilation fans;
7. fireman’s outfits, if required.

3.4.2 Fixed fire extinguishing system

3.4.2.1 Fixed fire extinguishing systems, such as sprinkler system, including water mist sprinkler system, gas, foam and dry powder fire extinguishing systems including gas cylinders shall be regularly checked every 2 years by approved service firm.

All flexible hose assemblies shall be subjected to a visual check on the occasion of above inspections. All flexible hose assemblies made of synthetic rubber shall be replaced according to manufacturer’s instructions.

The installation, maintenance, monitoring and documentation of above systems according to Statutory Regulations, for the engine room, pump room and all spaces containing essential equipment, such as switchboards, compressors, etc., and for the refrigeration equipment, if any, shall only be performed by approved service firm.

3.4.2.2 Where fixed foam fire extinguishing system is used, report on foam concentrates from foam manufacturer or independent laboratory shall be presented to the Surveyor.

Foam concentrates should be subjected to periodical control after the period of three years after filling into the system, and yearly thereafter.

The foam concentrate for the portable foam applicators shall be renewed on the occasion of each Class Renewal Survey.

More extensive regulations of the Flag Administration regarding other inspection intervals/ performance of the tests should be observed.

Records of the inspections and maintenance of above systems (Manufacturer’s certificate), including stating the properties of the foam concentrate shall be kept on board.

3.4.3 Portable and mobile fire extinguishers

All portable and mobile fire extinguishers shall be checked for proper location and condition.

Those equipment shall be checked every two years by approved service firm. Maintenance and eventual pressure testing shall be carried out as appropriate in accordance with the manufacturer’s instructions or applicable Rules.

An inspection label shall be affixed to the each extinguisher, showing the date of the inspection and name and stamp/seal of approved service firm.

Records of the inspections and maintenance of above equipment shall be kept on board.

3.5 Measurements and operational test

3.5.1 The machinery installation shall, in general, be examined and tested under full load working conditions. If the results of the trials are satisfactory, the Surveyor may waive opening up of the machinery.

3.5.2 In case of any doubts, the following measurements shall, in general, be carried out or it can be proved by valid protocols that they have been carried out recently:

1. a crank web deflection of main engine(s);
2. a crank web deflection of auxiliary diesel engine(s);
3. an axial thrust bearing clearance of shafting system(s);
4. an axial thrust bearing clearance of main and auxiliary gas turbine rotors, if applicable.
5. insulation resistance of electrical installations (see 3.3.7).

3.5.3 In addition to requirements under 3.3, during Intermediate Survey, the following systems and installations shall be examined:

1. the electrical equipment and cabling forming the main and emergency electrical installations shall, in general, be examined under operating conditions, so far as is practicable.

The satisfactory operation of the main and emergency sources of power and electrical services essential for safety in an emergency, including emergency generator and emergency switchboard, shall be verified under operating conditions, so far as is practicable. If the power sources are automatically controlled, they should be tested in the automatic mode;
2. bilge system, including emergency bilge valve(s) and bilge floating alarm;
3. ventilation and monitoring systems for the carriage of dangerous substances;
4. drainage facilities of starting air and control air receivers;
5. general operational test of the machinery and electrical installation to demonstrate unrestricted operability, as indicated by the Surveyor;
6. monitoring equipment (fire detectors, pressure indicators, thermometers, ammeters, voltmeters, revolution meters, etc.) including the automated functions of the machinery installation under operating conditions. The bridge remote control equipment of the propulsion system will be examined as required by the Surveyor. The satisfactory operation of some selected equipment
3.6 **Installations under pressure**

For steam boiler installations, thermal oil heaters and pressure vessels, see *Section 6*.

3.7 **Additional Surveys on Tankers – Type N, Type C and Type G**

3.7.1 **Tankers – Type N and Type C**

This item is applicable to vessels assigned with the type notation **Tanker** intended for the carriage in bulk of liquid dangerous goods.

The following equipment and installations shall be examined in addition to above requirements from *Sections 1, 2 and 3*:

1. piping systems, including their pumps and auxiliaries, pressure/vacuum relief valves, and pumps, valves and fittings;
2. cargo piping systems and cargo tank openings, including seals and covers, cargo tank alarms and flame arresters;
3. tank venting systems;
4. level/overfill alarms and level indicators;
5. fire extinguishing equipment;
6. inert gas or dry air system in operation, including alarms, indicated and safety devices (means for preventing backflow of cargo vapour to gas safe areas);
7. cargo pumps;
8. cargo piping systems and hold spaces;
9. cargo tanks level gauging including control, alarm and safety functions (a level gauges, a low level, a high level and overfill alarms);
10. cargo tanks, cargo piping and hold spaces;
11. cargo handling control and safety systems shall be examined, including:
   1. cargo tanks level gauging including control, alarm and safety functions (a level gauges, a low level, a high level and overfill alarms);
   2. control, alarm and safety systems monitoring the pressure in cargo tanks, cargo piping and hold spaces;
   3. monitoring systems of cargo temperature;
   4. control, alarm and safety systems of cargo compressors and cargo pumps;
   5. emergency shut down valves at shore connections and tanks.

3.7.2.2 The following equipment and installations shall be examined:

1. cargo pump rooms including whole system (gas detection system and equipment including sensors and alarms in operation) for its condition, for corrosion, leakage or conversion works which have not been approved.

   The condition of gas detection system in the cargo pump rooms shall be checked and inspection certificate with respect to the inspection of the cargo pump-rooms issued by the *Register* shall be kept on board;

2. gastight bulkhead penetrations including gastight shaft sealing, if any;

3. gastightness of doors and windows on wheelhouse;

4. venting system of cargo tanks and holds spaces and ventilation systems of all spaces in cargo area;

5. sealing arrangement of tanks/tank domes, penetrating decks/tank covers, of portable and permanent drip trays or insulation for deck protection in the event of cargo leakage;

6. inert gas or dry air system in operation, including alarms, indicators and safety devices (means for preventing backflow of cargo vapour to gas safe areas);

7. pressure/vacuum relief valves;

8. fire extinguishing equipment;

9. electric bonding of cargo tanks and cargo piping systems.

3.7.2.3 Cargo handling control and safety systems shall be examined, including:

1. cargo tanks level gauging including control, alarm and safety functions (a level gauges, a low level, a high level and overfill alarms);

2. control, alarm and safety systems monitoring the pressure in cargo tanks, cargo piping and hold spaces;

3. monitoring systems of cargo temperature;

4. control, alarm and safety systems of cargo compressors and cargo pumps;

5. emergency shut down valves at shore connections and tanks.

3.7.2.4 Insulation resistance test/measurement of generators and electrical equipment, including cables and switchboard shall be carried out unless it can be proved by valid protocols that the insulation level of electrical equipment has been verified within the third year from the date of issue of class Certificate.
4 CLASS RENEWAL SURVEY

4.1 General

4.1.1 Class Renewal Survey is an inspection of items relevant to the Certificate of class that include, in addition to the requirements of the Intermediate or Annual Survey, examination, test and checks of sufficient extent to ensure that the hull structure, main and auxiliary machinery, systems, equipment and various arrangements of the vessel are in a satisfactory condition and fit for the service for which the vessel is intended for the next period of validity of the Certificate of class, subject to proper maintenance and operation and the periodical surveys being carried out at the due dates as it is prescribed by the Rules.

A survey planning meeting shall be held prior to the commencement of the survey in accordance with 1.6.

4.1.2 Class Renewal survey leads to the issue of a new Certificate of class, while other regular survey leads to the endorsement of existing Certificate of class.

Class Renewal survey may commence earliest 12 months prior to Certificate of class due date and shall be carried out at the intervals indicated by the Character of Class term.

A Class Renewal Survey may be carried out in several parts and the total survey period of the Class Renewal Survey shall not exceed 12 months, except under special agreement with the Register.

Upon Owners’ request, in exceptional cases the class extension may be granted by the Register (see 1.3).

4.1.3 If the class Renewal survey has been completed within time interval of 3 (three) months before the due date of the Certificate of class, the new Certificate shall be issued according to the due date of such previously issued certificate.

In case of extension of validity of class Certificate, the period of class will commence the following day after which the last Certificate of class has expired (see also 1.3).

If the class Renewal survey has been completed more than 3 (three) months before the due date of the Certificate of class, the new Certificate shall be issued according to the date of the completion of class Renewal survey.

If the class Renewal survey has been completed after the due date of the Certificate of class, the new Certificate shall be issued according to the due date of such previously issued certificate.

If the class Renewal survey has been performed concurrently with major repairs/reconstruction/modifications, for completion of which longer period of time is needed, the new Certificate of class will be issued according to the date of the completion of such repairs/reconstruction/modifications.

4.1.4 Class Renewal Surveys for hull are numbered in the sequence I, II, III, etc., depending upon the age of the vessel, at time of Class Renewal Survey:

- Class Renewal Survey I: vessels age ≤ 5 years old;
- Class Renewal Survey II: 5 < vessels age ≤ 10 years old;
- Class Renewal Survey III: 10 < vessels age ≤ 15 years old;
- Class Renewal Survey IV: 15 < vessels age ≤ 20 years old, etc.

Regarding their scope, see 4.2 to 4.4.

4.1.5 Class Renewal Survey is in principle to be held when the vessel is in dry dock or on a slipway unless a Dry docking Survey has already been carried out within 12 months prior to Certificate of class due date (see Section 5).

If high resistance paint is applied to the underwater portion of the hull or vessels are of unusual characteristics or engaged on special services, means of underwater inspection equivalent to the bottom survey in dry condition may be considered as an alternative by the Register.

4.1.6 The examinations of the hull shall be supplemented by thickness measurements as required in Section 7 and testing as required in 4.2.4, 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 deformation that may be present.

Thickness measurements of the outer shell plating and vessel’s structure, as and if required within the scope of the related Class Renewal Survey referred to in Section 7, shall be carried out, if not already done in the last year of Class term.

4.1.7 Upon completion of the Class Renewal Survey, the Surveyor shall be satisfied that the entire hull, machinery installation including electrical installations and steering gear, as well as special equipment and installations are operable without any restrictions. In case of doubt, trials and/or operational tests may be necessary.

4.1.8 In addition to the inspections and checks to be carried out on occasion of the Intermediate Surveys (see Section 3), for class Renewal the following requirements shall be observed.

4.2 Hull and hull equipment – Class Renewal Survey I

4.2.1 Class Renewal Survey I will have to be performed at the end of the first Class term C1.

The Owner or the Management Company are responsible to prepare the vessel for survey in accordance with the requirements stated in 1.5.

4.2.2 Hull - general

4.2.2.1 The hull survey covers outer shell plating, the entire hull structure, including double bottom, decks, holds, cofferdams, deep and wing tanks, cargo, ballast, peak, casings, hatch coamings, superstructures, chain lockers, river chests, engine, boiler and pump rooms, all machinery spaces, pipe tunnels and duct keels, void spaces and dry spaces, store rooms, and all other compartments which are integral part of the hull structure.

All above spaces shall be internally examined including the plating and framing, bilges and drain wells, piping systems, sounding, venting, pumping and drainage arrangements.
Particular attention shall be given to the structure in the way of discontinuities where stress concentration may occur (openings in the shell, openings in the deck, doors, hatch coamings and corners, engine foundations and ends of superstructure) and in the way of parts of structure where signs of wastage are evident either excessively reduced or which are found defective such as hatch corners and other similar structure discontinuities.

4.2.2.2 Ceiling, insulation, sheathing and other covering may be removed in order to examine below structure, at the Surveyor’s discretion, in the case of doubt as to the condition of plating underneath.

4.2.2.3 Where holds are insulated for the purpose of carrying refrigerated cargoes a sufficient amount of insulation shall be removed to enable the framing and plating in the way to be examined, unless constructional arrangements make such inspections possible without removing the insulation.

In refrigerated cargo spaces the condition of the coating behind the insulation shall 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 shall be extended as deemed necessary by the Surveyor. The condition of the coating shall be reported. If indents, scratches, etc., are detected during surveys of shell plating from the outside, insulation’s in way shall be removed as required by the Surveyor, for further examination of the plating and adjacent frames.

4.2.2.4 In cases where the inner surface of the bottom plating is covered with cement, asphalt, or other composition, the removal of this covering may be dispensed with, provided that it is inspected, tested by beating or chipping, and found sound and adhering satisfactorily to the steel. The steel work shall be examined before painting or before the cement or other coverings are renewed.

Various non-destructive methods may be used during investigations of equipment or installations, such as radiography (X or gamma rays) and ultrasonic test or, for crack detection, magnetic particle test or dye penetrant test shall be employed, and a test protocol shall be prepared.

4.2.3 Engine room including all machinery spaces

4.2.3.1 Engine room structure shall be examined and particular attention shall be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, engine room bulkheads in way of tank tops and bilge wells. Platform plates shall be lifted as may be necessary for the examination of the structure.

In addition, particular attention shall be given to the river suction, river water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspected, thickness measurements shall be carried out, and renewals or repairs affected when wastage exceeds permissible limits.

4.2.3.2 For cargo pump rooms the survey of the condition of bulkheads for signs of oil leakage or fractures, and, in particular, the sealing arrangements of all penetrations of bulkheads, ventilation system, including ducting, dampers and screens, piping systems and pumps, and verification of proper operation shall be carried out.

4.2.4 Tanks and piping

4.2.4.1 Tanks shall be internally examined and tested in accordance with the requirements of Table 4.2.4-1 in order to ascertain the condition of the structure, bilges and drain wells, sounding, venting, pumping and drainage arrangements, including piping systems and their fittings. Particular attention shall be given to tanks having boundaries with heated cargo tanks and plating or double plates below the lower end of sounding and suction pipes.

Testing pressure to be applied as defined in the Rules, Part 2 – Hull and Hull Equipment, Chapter III, 5.8 and Chapter VII, Section 3.

NOTE: For inspection and testing of cargo tanks of tankers see 4.7.

4.2.4.2 For all 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 shall be examined at annual intervals. Thickness measurements shall 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 shall be carried out.

4.2.4.3 Examination of all bilge and ballast piping systems shall be carried out. Piping systems shall be operationally tested to working pressure to Surveyor’s satisfaction in order to ensure that tightness and piping system condition is satisfactory.

Where pipes are led through tanks, they shall be examined and, if required by the Surveyor, subjected to hydraulic tests, if for the respective tanks an internal examination is required. Depending on the results obtained, thickness measurements may be required. Special attention shall be given to fuel oil piping passing through ballast tanks, which shall be pressure tested on the class renewal survey II and subsequent ones.

Thickness measurements shall be carried out as deemed necessary by the Surveyor, see Section 7. The maximum permissible large surface reduction of piping thickness shall not exceed the values of corrosion allowance defined in the Rules, Part 3 – Machinery, Systems and Electricity, Chapter I, 7.4.1.
4.2.5 Rudder, steering gear and deck equipment

4.2.5.1 The following equipment essential for the safety and operation of the vessel, such as rudder and steering gear, watertight doors, including bow, side and stern doors, if any, sluice valves, masts and standing riggings, gas-freeing and safety arrangements of cargo tanks, life-boat davits, companionways, hatches, scuppers and water drain pipes with their valves, fire protecting arrangements, masts, shall be examined.

The rudder, rudder couplings and bearings, as well as the stock shall be surveyed in mounted condition, the rudder clearance to be measured and documented. Each rudder shall be lifted for examination of the pintles if considered necessary by the Surveyor.

The steering gear including auxiliary steering gear, and its connections and control and indication devices shall be examined. The steering gear shall be submitted to an operational trial. If considered necessary in view of the inspection results, the rudder and/or parts of the steering gear may have to be dismantled.

4.2.5.2 Anchoring equipment including windlass(es), anchor chains, hawser, chain stoppers and hawse pipe(s), and mooring equipment shall be examined. Windlass(es) and associated driving equipment, where fitted, shall be examined under working conditions. Opening up may be required by the Surveyor depending upon the trial results or the condition of certain components.

Hatch covers, hatch coamings and their securing and sealing devices shall be surveyed and confirmation shall be obtained that no unapproved changes have been made since the last survey. Checking of the satisfactory operation of all mechanically operated hatch covers shall be made, including stowage and securing in open condition, proper fit, locking and efficiency of sealing in closed position, including hose testing or another suitable means if considered necessary by the Surveyor, operational testing of hydraulic and power components, wires, chains and link drives.

4.3 Hull and hull equipment – Class Renewal Survey II

4.3.1 Class Renewal Survey II shall include all requirements for Class Renewal Survey I. In addition following examinations shall be carried out.

- Thickness measurements shall be carried out in accordance with Section 7.
- Hull structure behind ceiling, insulation, sheathing and other covering shall be examined, as required by Surveyor and depending on the general condition of vessel.
- In vessels having a single bottom, a sufficient amount of close ceiling shall be lifted on each side from the bottom and bilges to permit the structure below to be examined.
- In vessels having a double bottom, a sufficient amount of ceiling in the cargo holds and other spaces shall be removed from the bilges and inner bottom to enable the condition of the plating, pillar feet and the bottom plating of bulkheads and tunnel sides to be ascertained.
- If it is found that the plating is clean and in good condition, and free from rust, the removal of the remainder of ceiling may be dispensed with. The Surveyor may waive the removal of heavy reinforced compositions if there is no evidence of leakages, cracking or other faults in the composition.

4.3.2 Tanks including cargo tanks shall be internally examined and tested in accordance with the requirements of Table 4.2.4-1. Notes and testing requirements shall be observed.

Depending on the vessel's age, the Surveyor may require opening of ballast tanks for visual inspection, particularly if deterioration of the coating or excessive wastage has already been observed at previous surveys.

Where the coating in ballast tanks is found to be in POOR (see 1.2.6) condition, maintenance of class shall be subject to the tanks in question being examined at annual intervals, and thickness measurements carried out as considered necessary. If coating has to be partly or completely renewed, only approved coating is applicable. The entire working procedure including the surface preparation has to be documented.

4.3.3 At the Class Renewal Survey II and all subsequent Class Renewal Surveys, the chain cables shall be ranged and examined for wear or other damages throughout their entire length.

The chain cables shall be gauged and renewed in cases where their mean diameter is worn over 12% from its nominal diameter. The mean diameter of the anchor chain cables shall be determined on at least 3 links per each length of 27,5m.

4.4 Hull and hull equipment – Class Renewal Survey III and subsequent ones

4.4.1 Class Renewal Survey III shall include all requirements for Class Renewal Survey II. In addition following examinations shall be carried out.

4.4.2 A sufficient amount of ceiling in the holds and other spaces shall be removed from the bilges and inner bottom to enable the condition of structure in the bilges, the inner bottom plating, pillar feet, and the bottom plating of bulkheads to be examined. If the Surveyor deems it necessary, the whole of the ceiling shall be removed.

For class Renewals IV and subsequent ones the inner bottom ceilings shall be completely removed and the tank top shall be carefully cleaned, such as to enable proper assessment of the tank top's condition.

The wall lining underneath windows in the outer shell shall be lifted as required by the Surveyor so that the structure behind may be examined.

Portions of wood sheathing, or other covering, on steel decks shall be removed, as considered necessary by the Surveyor, in order to ascertain the condition of the plating.

Casings or covers of air, sounding, steam and other pipes, spar ceiling and lining in way of side scuttles shall be removed, as required by the Surveyor. The chain locker shall be cleaned internally.

4.4.3 Tanks including cargo tanks shall be internally examined and tested in accordance with the requirements of Table 4.2.4-1. Notes and testing requirements shall be observed. In addition see 4.3.2.
4.4.4 The rudder, rudder couplings and bearings, as well as the rudder stock shall be examined as far as practicable. The connections to the rudder stock and pertinent securing devices shall be inspected. The rudder clearance to be measured and documented.

Following the above examination the rudder and other items shall be dismantled for examination as deemed necessary by the Surveyor. In way of the bearings, stock and pintle shall be examined for corrosion.

4.4.5 In addition to the stated under 4.3.3 the anchors shall be examined and weight shall be checked. If the weight of the anchor has been reduced by 10% or more from its nominal weight it shall be renewed.

4.5 Machinery and electrical installations

4.5.1 The Class Renewal Survey shall include the surveys and examinations from 3.3.

When the vessel is in dry dock or on a slipway, the propeller(s), stern-bush(es), water inlets and outlets and gratings shall be examined. River inlets and outlets shall be opened up and internally examined. For details about propeller, propeller shaft and stern tube shaft, see 4.6.

Bow thruster and positioning equipment shall be subjected to a general survey and to trials upon launching of the vessel.

Initial starting arrangements including the electric ignition system, if fitted shall be tested. The manoeuvring of engine(s) shall be tested under working conditions.

Inspection of the propulsion system is, in general, related to survey of intermediate shafts and bearings, including thrust bearings, mechanical and flexible couplings, gearing, turning gear and of the main propulsion.

Spring elements made of rubber ring clutches with or without plies of fabric and under shear load, and other rubber or fibre reinforced plastic couplings shall be renewed, if required on account of negative inspection results.

4.5.2 Machinery - propulsion and auxiliary engines

4.5.2.1 The following parts of the main and auxiliary diesel engine(s) shall be opened out and examined in dismantled condition, if considered necessary by the Surveyor, taking in consideration manufacturer’s instructions and that reduction in the scope of survey of auxiliary engines may be agreed to upon examination of the maintenance protocols:

- cylinders with their liners, cylinder covers, valves and valve gear, pistons, piston rods and bolts, crossheads, guides, connecting rods;
- crankshafts and all bearings, crankcases, crankcase door fastenings and explosion relief devices;
- scavenge blowers, air compressors and their intercoolers, filters and/or separators, monitoring, control, protective and safety devices, starting, reversing and manoeuvring equipment;
- injection system, camshaft with drives and bearings, fuel pumps and fittings, superchargers and their associated coolers, suction and exhaust lines and torsional vibration dampers or detuners;
- flexible couplings, clutches, reverse gears, attached pumps and cooling arrangements;
- tie rods, frame, foundation and fastening elements, bedplates and holding down bolts and chocks of main and auxiliary engines.

NOTE: Class Renewal Survey of the main engine can be done during the main overhaul subject to the presence of the Surveyor. In case of medium speed diesel engines, dismantling and replacement of main and crank bearings may be postponed until the service life limits have been reached.

Intermediate shafts, thrust shaft, thrust block and all bearings shall be examined. The lower halves of bearings need not be exposed if alignment and wear are found to be acceptable.

The clearance in each stern-bush shall be ascertained.

Selected pipes in the starting air system shall be removed for internal examination and shall be hammer tested and hydraulically tested. Some of the pipes selected shall be those adjacent to the starting air valves at the cylinders and the discharge from the air compressors.

If needed and in order to be able to restore machinery operation and manoeuvring capability of the vessel in case of damage, spare parts for the main propulsion and the essential equipment shall be available on board, documented and maintained in a corresponding list.

4.5.2.2 For electrically propelled vessel, the propulsion motors, generators and exciters, particularly the windings of these machines, and their ventilating systems shall be examined and tested. Checking of the electric switch gear for operability shall cover also the protective, safety and interlocking devices.

The insulation resistance of all electric machinery and equipment shall be tested (see 4.5.4).
Chapter III - SURVEYS

Part 1 – Classification and Surveys

Table 4.2.4-1
Tank internal examination and testing requirements - all vessels

<table>
<thead>
<tr>
<th>Tank</th>
<th>Renewal survey I (age ≤ 5)</th>
<th>Renewal survey II (5 &lt; age ≤ 10)</th>
<th>Renewal survey III (10 &lt; age ≤ 15)</th>
<th>Renewal survey IV and subsequent surveys (age &gt; 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water ballast (all types) and peaks,</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Cargo tanks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Oil bunker tanks:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine room</td>
<td>None</td>
<td>None</td>
<td>One</td>
<td>One</td>
</tr>
<tr>
<td>Cargo Length area</td>
<td>None</td>
<td>One</td>
<td>Two</td>
<td>Half, minimum 2</td>
</tr>
<tr>
<td>If no tanks in Cargo Length Area,</td>
<td>None</td>
<td>One</td>
<td>One</td>
<td>One</td>
</tr>
<tr>
<td>additional fuel tank(s) outside of engine room(if fitted)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubricating oil</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>One</td>
</tr>
<tr>
<td>Fresh water</td>
<td>None</td>
<td>One</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

Testing requirements
1. Boundaries of double bottom, including each compartment of double bottom, cofferdams, deep, ballast, peak, and all other tanks, including holds adapted for the carriage of salt water ballast if any, shall be tested with a head of liquid to the top of the overflow or air pipe or up to the top of hatch of a ballast/cargo holds, whichever is higher.
2. Boundaries of fuel oil, lube oil and fresh water tanks shall be tested with a head of liquid up to the top to of the tank (the highest point that liquid will rise under service conditions). Fuel oil, lube oil and fresh water tanks need not to be emptied and their testing may be specially considered based on 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.
3. The test pressure to be applied is defined in the Rules, Part 2 – Hull and Hull Equipment, Chapter III, 5.8 and Chapter VII, Section 3.
4. The tightness of pipe tunnels outside the inner bottom, and of void spaces, may be tested by air pressure. Air pressure testing of other spaces shall be agreed with the Surveyor on a case to case basis. The overpressure shall not exceed 0,2 bar and not be less than 0,1 bar.
5. The cargo tanks of tankers Type N and Type C including gas collector if any, shall be tested by water and/or air pressure at even Class Renewal Surveys only (second, fourth, sixth and so forth). In the case of air tightness and pressure test, the test has to be carried out in accordance to 1) above. If substances are carried which cause corrosion in connection with water, the kind of testing shall be specified.
   Tanks may be tested when the vessel is afloat, provided that the internal examination of the bottom is also carried out afloat. See also 4.7.1.
6. Cargo tanks intended for carriage of pressurized liquefied gases on tankers Type G, including their fittings shall be pressure tested like pressure vessels. See Section 6.
   Tightness of cargo tanks and domes shall be verified. However, for a vessel of less than fifteen years of age, a separate tightness test may not be required for each tank, provided the examination of the log book raises no doubts as to their tightness.
   If results of cargo tanks examination and testing, or the examination of the log book raise any doubts as to the structural integrity or tightness of a cargo tank, or when significant repairs have been carried out, hydraulic or hydro pneumatic testing shall be carried out. See also 4.7.2.

General notes:
• These requirements apply to tanks of integral (structural) type. Independent non-structural tanks located in machinery spaces shall be externally examined. The relevant fittings, with particular regard to the remote control shut-off valves under hydrostatic head, shall be externally examined to check the efficiency of manoeuvres and the absence of cracks or leakage.
• If a selection of tanks is accepted to be examined, then different tanks shall be examined at each renewal survey, on a rotational basis. Peak tanks (all uses) are subject to internal examination at each renewal survey.
• At Class Renewal Survey III and subsequent surveys, one deep tank for fuel oil in the cargo length area shall be included, if fitted. The extent of the survey of tanks dedicated to liquids other than those indicated in this table will be considered by the Register on a case by case basis according to the nature of the liquids.
• On tankers which exclusively carries cargo not causing corrosion, the cargo tanks shall be inspected internally at even Class Renewal Survey only (second, fourth, sixth and so forth), provided that it may be assumed on the basis of random checking that the cargo tanks are in satisfactory condition. See also 4.7.1.
• If tanker Type G carries only gases or gas mixtures in these tanks, not causing corrosion on cargo tanks walls, the cargo tanks shall be inspected internally at even Class Renewal Survey only (second, fourth, sixth and so forth), provided that it may be assumed on the basis of random checking that the cargo tanks are in satisfactory condition.
4.5.3 Other auxiliary machinery and systems – survey requirement

The following equipment components shall be opened out and examined in dismantled condition, if considered necessary by the Surveyor:

- cooling water pumps, fire pumps, bilge and ballast pumps, including all safety devices;
- auxiliary engines, air compressors with their inter-coolers, filters and/or separators and safety devices including testing under working conditions, coolers and preheaters;
- main and auxiliary steering machinery, hydraulic pumps, safety devices, including testing of mechanical and hydraulic control devices under working conditions;
- anchoring and mooring windlass(es), including operational check, check of the brake and testing of safety devices;
- emergency drain valves and bilge piping systems, including all other piping and their pipe joints, expansion joints, valves, cocks, flexible pipes and rubber connections and safety devices;
- means fitted against ingress of water into open spaces under all service conditions;
- tank filling level indicators, oil purifier and sewage systems, freshwater distillation plant, if any.

**NOTE:** Extent of examination for prime movers and auxiliary machinery such as generators, pumps, compressors etc. shall be decided by the Surveyor taking into account of the type and general condition of prime mover, number of working hours and results of testing under service conditions. If considered necessary by Surveyor, special equipment and installations included in the scope of classification may be examined.

4.5.4 Electrical installations – survey requirement

4.5.4.1 The following items shall be examined and functionally tested, and they shall be opened out if deemed necessary by the Surveyor: main and emergency sources of electric power including automatic starting of emergency sources of power, switchboards, motors of the essential services, cables, heaters, pumps, ventilation, alarms, detectors, signal devices, remote controls of transfer and fuel oil pumps including draught ventilation and engine room ventilation fans, navigation lights, etc.

Electrical installations and equipment located in spaces in which there is a risk of inflammable gas or vapour/air mixtures accumulating, shall be checked as to the explosion protection provided.

For vessels carrying dangerous goods, the condition of safety electrical equipment in relation to explosive atmospheres especially in cargo area has to be checked.

4.5.4.2 The insulation resistance shall be measured.

On main and emergency switchboards feeder circuit breakers being open, busbar circuit closed, measuring and monitoring instruments disconnected, the resistance of insulation measured across each insulated busbar and hub, and across insulated busbars shall not be less than 1.0 MΩ.

For generators, the equipment and circuits normally connected between the generator and first circuit breaker being connected, preferably at working temperature whenever possible, the resistance of insulation, in ohms, shall be more than 1000 times the rated voltage, in volts. The insulation resistance of generators separate exciter gear shall not be less than 0.25 MΩ.

With all circuit breakers and protective devices closed, except for the generators, the insulation resistance of the entire electrical system shall be checked.

The insulation resistance shall, in general, not be less than 100.0 kΩ between all insulated circuits and earth. The readings of the insulation resistance test shall be documented and submitted to the Surveyor.

In case the results are not in accordance to above requirements or insulation resistance drops suddenly supplementary investigation and necessary repairs have to be carried out.

4.5.5 Fire extinguishing and fire alarm system

The fire extinguishing system shall be ready for operation. The complete installation shall be subject to a visual inspection and test, if considered necessary by the Surveyor. Surveys shall satisfy themselves as to the efficient condition of the fire protection, detection and extinguishing arrangements so far as applicable.

It shall be confirmed that minimum recommended maintenance is carried out by the approved service supplier what includes all high pressure cylinders, pilot cylinders, bottles, fire extinguishers, etc. to be inspected by an approved service supplier in accordance to the manufacturer’s instructions, applicable codes or directives. Reports of these inspections have to be submitted to the Surveyor.

The foam concentrate for the portable foam applicators shall be renewed on the occasion of each class renewal where more than 3 years passed from the date of filling the foam into the system. More extensive regulations of the Flag Administration regarding other inspection intervals/performance of the tests should be observed.

4.6 Survey of propeller shafts, propellers and other propulsion systems

4.6.1 Periodical surveys and adequate tests of propeller shafts, propellers and other propulsion systems and parts shall be carried out in order to keep class maintained.

The following surveys are applicable for propeller shafts:

- complete survey (with or without drawing of the shaft);
- modified survey.

4.6.2 Complete survey of propeller shafts - general

4.6.2.1 Shafts having approved continuous liners or approved oil sealing glands, or made of corrosion resistant materials, or protected against corrosion, or mechanically grease-lubricated, shall be completely surveyed at intervals of five years and possibly in connection with a dry dock survey, in any of the following three cases:

- the propeller is fitted to the shaft by means of approved solid flange coupling at the aft end of the shaft, the shaft and its fittings are not exposed to corrosion.
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4.6.4 Complete survey without drawing of the shaft

4.6.4.1 If the prerequisites defined in 4.6.2 apply, the scope of complete survey without drawing of the shaft, for oil lubricating arrangement consists in the examination of all accessible parts of the propeller shaft including the propeller connection to the shaft.

In addition to above, the following examinations shall be performed:

- the after end of the cylindrical part of the shaft (from the after end of the liner, if any) and forward one third of the length of the shaft taper from the large end and of the area of keyway for keyed propellers;
- the forward part of the aft shaft taper for keyless propellers;
- the aft fillet of the flange (in case of shafts having solid coupling flanges at the after end), shall be examined by an approved surface crack detection method such as magnetic particle or dye penetrant.

The area to be examined shall be sufficiently exposed, if necessary by shifting of the propeller shaft or backing-off of the propeller.

NOTE: Where the propeller is fitted to a solid flange coupling at the aft end of the shaft and if the visual examination of the area is satisfactory, a non-destructive examination of the fillet radius of the aft propeller shaft flange may be dispensed with.

Any doubt exists regarding the findings of the above, further dismantling may be required including withdrawal of the shaft to permit an entire examination.

4.6.3 Complete survey with drawing of shaft

Complete survey with drawing of shaft consists of the following, if applicable:

- dismantling of propeller and key (if fitted) and their examination;
- complete withdrawal of the shaft and examination of stern tube bearings;
- visual inspection of all parts of the shaft especially the shaft taper, the keyway, the bearings, the bearing contact areas of the shaft, liners, joints, propeller cone and the propeller nut thread;
- examination of the after end of the cylindrical part of the shaft and forward one third of the length of the shaft taper from the large end, or the fillet of the flange (in case of shafts having solid coupling flanges at the after end) by an appropriate surface crack detection method;
- examination of the parts of the stern tube oil glands including dismantling if considered necessary by Surveyor;
- measurements of bearing clearances and/or wear-down of the propeller shaft and recording before and after the survey.

4.6.2 Destructive examination of the aft fillet of the flange may be carried out if the visual examination of the area is not satisfactory;

- the propeller is fitted with keyed shaft taper which design is in compliance with applicable requirements from the Rules, Part 3 – Machinery, Systems and Electricity, and a non-destructive examination of the after end of the cylindrical part of the shaft (from the after end of the liner, if any), and forward one third of the length of the shaft taper from the large end is performed at each survey by an approved surface crack detection method such as magnetic particle or dye penetrant;
- the propeller is fitted with keyless type attachments, the propeller shaft is protected from river water, with approved design, and non-destructive examination of the forward part of the aft shaft taper is performed by an approved surface crack detection method such as magnetic particle or dye penetrant.

For other cases of shafts interval of surveys may be shorter and the scope of survey shall be agreed with the Register.

NOTE: Where the propeller is fitted to a solid flange coupling at the aft end of the shaft and if the visual examination of the area is satisfactory, a non-destructive examination of the fillet radius of the aft propeller shaft flange may be dispensed with.

Unless alternative means are provided to assure the condition of the shaft all propeller shafts shall be sufficiently withdrawn to permit entire examination.

4.6.2.2 Where oil lubricated shafts with oil glands are fitted, and oil glands are capable of being replaced without withdrawal of the shaft or removal of the propeller, the propeller shaft need not be withdrawn under the following conditions:

- all exposed and accessible areas of the shaft area as described above are satisfactory examined visually and examined by an approved surface crack detection method;
- the clearances of the aft stern tube bearing examined and wear-down found acceptable;
- external examination of oil glands and propeller including fastenings and securing arrangements found acceptable;
- the records of lubricating oil analysis and oil consumption, carried out and found documented on board and within permissible limits as specified in 4.6.4.2.

NOTE: If any doubt exists regarding the findings of the above, further dismantling may be required including withdrawal of the shaft to permit an entire examination.

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Oil samples should be taken under service conditions, i.e. with a rotating shaft and the system at service temperature. These samples, unless supervised by the Surveyor, shall be collected and identified by the Chief Engineer.

The metal and water content values should be considered taking into account the type of seals used and the chemicals composition of the bearing material.

Suggested upper limits are given below for guidance only: water 1%, nickel 10,0 ppm, chromium 10,0 ppm, silicon 40,0 ppm, copper 50,0 ppm, tin 10 ppm, iron 30 ppm, magnesium 30,0 ppm, lead 10,0 ppm, sodium 80,0 ppm, chloride content in water 70,0 ppm (ingress of water).

These limits should be considered versus the elapsed time.

Where the Surveyor considers that the data presented is not entirely to his satisfaction the shaft will be required to be withdrawn to permit an examination according to 4.6.3.

4.6.5 Modified survey of propeller shaft

4.6.5.1 Modified survey is an alternate way of examination of the propeller shaft and may be accepted instead of complete survey at alternate t yearly surveys (+/- 6 months) for propeller shafts described in 4.6.2, provided that:

- the shaft is fitted with oil lubricated bearings and approved oil sealing glands, or they are mechanically grease-lubricated;
- the clearances of the aft bearing are found in order;
- the oil and oil sealing arrangements have proved effective after the survey stated below and lubrication oil analysis are carried out regularly at intervals not exceeding six months and consisting of data about water content, chloride content, content of bearing metal particles and oil aging (resistance to oxidation) including recording of oil consumption at the same intervals;
- the shaft and its fittings are not exposed to corrosion and the design details are approved.

The maximum interval between two complete surveys shall not exceed two Class terms.

4.6.5.2 The Modified survey shall consist of:

- measurements of the clearance/wear-down including recording of the measurements;
- checking of the condition and efficiency of the oil sealing glands;
- the examination of stern tube lubricating oil analysis to confirm they have been regularly performed and to be within acceptable limits, and oil consumption recording to be within permissible limits.

In addition to above, below requirements for the different types of shafts shall be fulfilled (4.6.5.3 to 4.6.5.5).

4.6.5.3 For propeller shafts with a solid flange coupling at the aft end and controllable pitch propeller, the tightness in a way of blade glands and distribution box shall be checked including examination of hydraulic oil analysis.

The blade manoeuvring working test shall be carried out, as far as practicable.

4.6.5.4 For propeller shafts fitted with keyed propeller coupling propeller and a key shall be removed and shaft taper shall be visually examined in a way of connection area.

The aft end of the cylindrical part of the propeller shaft and forward one third of the length of the shaft taper from the large end shall be examined by an approved surface crack detection method such as magnetic particle or dye penetrant.

4.6.5.5 For propeller shafts fitted with keyless type propeller coupling tightness of the propeller boss including propeller cap and fore gland shall be checked.

NOTE: If any doubt exists regarding the findings of the above, further dismantling may be required including withdrawal of the shaft to permit an entire examination.

4.6.6 Propellers

4.6.6.1 During complete or modified surveys of the propeller shafts, the propellers as well as the remote and local control gear of controllable pitch propellers shall be visually inspected at the Surveyor’s discretion.

4.6.6.2 Damages, such as cracks, deformation, cavitation effects, etc. shall be reported and repaired at the Surveyor’s discretion (see the Rules, Part 25 – Metallic materials).

Controllable pitch propellers shall be checked for possible oil leakages. The maintenance according to manufacturer's instructions shall be checked. A function test shall be carried out.

4.6.6.3 Special propulsion systems, such as rotating thrusters (pod, rudder and steering propellers), vertical axis propellers and water jet units for main propulsion purposes as well as athwart ship thrust propellers shall be completely surveyed, in the scope agreed with the Register and observing the manufacturer’s instructions, at the same intervals as propeller shafts.

4.6.6.4 As far as practicable, the gearing and control elements of rudder and steering propellers shall be examined through inspection openings.

For other systems, the scope of Survey shall be agreed with the Register.

4.7 Additional Surveys on Tankers – Type N, Type C and Type G

4.7.1 Tankers – Type N and Type C

4.7.1.1 The requirements of this item are applicable to vessels assigned with the type notation Tanker intended for the carriage in bulk of liquid dangerous goods.

The requirements of Sections 1, 3 and 4 shall be complied with as applicable.

4.7.1.2 In addition to above requirements special attention shall be given to the inside structure and bottom/side plating of the tanks in order to ensure that there is no excessive corrosion/pitting of the plating.

If extensive corrosion/pitting is found, care shall be taken to preserve the longitudinal and local strength of the bottom by the requisite renewals or repairs. The condition of internal coatings, if applied, shall be examined.
The minimum requirements for close-up surveys are given in Section 7.

4.7.1.3 On tankers which exclusively carries cargo not causing corrosion, the cargo tanks shall be inspected at even Class Renewal Survey only (second, fourth, sixth and so forth), provided that it may be assumed on the basis of random checking that the cargo tanks are in satisfactory condition, and provided that no objections will result from the tightness and pressure tests as per Table 4.2.4-1, Testing requirements 1.4.

4.7.1.4 The cofferdams shall be hydrostatically tested with water at each Class Renewal Survey as defined in the Rules, Part 2 – Hull and Hull Equipment, Chapter III, 5.8 and Chapter VII, Section 3.

4.7.1.5 The cargo tanks including gas collector if any, shall be tested by water and/or air pressure at even Class Renewal Surveys only (second, fourth, sixth and so forth) in accordance with the test pressure stated in the Rules. In the case of air tightness and pressure test, the test has to be carried out according to Table 4.2.4-1. If substances are carried which cause corrosion in connection with water, the kind of testing shall be specified.

4.7.1.6 Cargo tanks of tankers carrying acids and lye solution shall be inspected internally.

At each Class Renewal Survey above tanks shall be hydrostatically tested with pressure defined in the Rules, Part 2 – Hull and Hull Equipment, Chapter III, 5.8 depending on the cargo density.

4.7.1.7 Cargo piping, including valves and fittings, pumps as well as gas-freeing and safety equipment shall be inspected.

The loading and discharge pipes of tankers shall be tested to 1,25 times the permissible working pressure with a minimum of 10 bar at each Class Renewal Survey. The Surveyor may require dismantling and/or thickness measurement of piping. The special attention shall be paid when components are replaced in the cargo handling installation to verify components compatibility with the chemical characteristics of the products transported.

4.7.1.8 Inert gas system, including alarms and safety devices of the cargo tanks shall be checked in operation.

4.7.1.9 Condition of electrical equipment in relation to explosive atmospheres, especially in the cargo area, such as cables and certified safe type of equipment installed in dangerous zones and spaces on tankers, including cable runs and connecting terminals, shall be examined.

4.7.2 Tankers – Type G

4.7.2.1 The requirements of this item are applicable to vessels assigned with the type notation Tanker intended for the carriage of liquefied gases.

The requirements of Sections 1, 3 and 4 shall be complied with as applicable. The minimum requirements for close-up surveys are given in Section 7.

The requirements contain the minimum extent of examination, thickness measurements and tank testing. When substantial corrosion, as defined in 1.2.19, and/or structural defects are found, the survey shall be extended and shall include additional close-up surveys when necessary.

Thickness measurements of structures in areas where close-up surveys are required shall be carried out simultaneously with close-up surveys.

4.7.2.2 In addition to the requirements given under 4.7.1, the examinations, measurements and testing given in 4.7.2.3 to 4.7.2.7 shall be carried out.

4.7.2.3 Examination of cargo tanks

All independent tanks shall be examined externally so far as practicable and particular attention shall be paid to the plating in way of supports and of securing arrangements and pipe connections including chocks and keys and adjacent structure. If cargo tanks are insulated and the insulation accessible, the insulation, including any vapour or protective barrier, should be examined externally and sections removed for examination of the tank if considered necessary by the Surveyor.

Cargo tank internal pipes and fittings shall be examined, and all valves and cocks in direct communication with the interiors of tanks shall be opened out for inspection and connection pipes shall be internally examined, so far as practicable.

Pressure relief valves and vacuum relief valves or other pressure relief device in the cargo tank holds, including pressure relief valves of cargo tanks, shall be opened out for inspection, adjusted afterwards, sealed and tested to the Surveyor’s satisfaction.

4.7.2.4 Examination of cargo area

All gastight bulkheads of holds surrounding cargo tanks, including gastight bulkhead penetrations and gastight shaft sealings, if any, shall be examined. The venting system of cargo tanks and hold spaces shall be checked, as well. Gastightness of doors and windows on wheelhouse shall be verified.

Inert gas or dry air system in operation, including pipelines, valves, hose and spool pieces used for segregation of piping systems for cargo, inert gas and bilge, means for preventing backflow of cargo vapour to gas safe areas, shall, in general, be examined and tested to show it to be operating satisfactorily within the gas specification limits.

Pressure vessels for the storage of inert gas shall be examined internally together with their fastenings. Pressure relief valves shall be demonstrated to be in good working order. Liquid nitrogen storage vessels shall be examined as far as practicable and all control equipment, alarms and safety devices shall be verified as operational.

Gas detection equipment, including alarms and indicators in operations, shall be checked and verified.

Sealing arrangement of tanks/tank domes, penetrating decks/tank covers, of portable and permanent drip trays or insulation for deck protection in the event of cargo leakage shall be checked.

4.7.2.5 Testing of cargo tanks

Cargo tanks intended for carriage of pressurized liquefied gases, including their fittings shall be pressure tested like pressure vessels. See Table 4.2.4-1.
If gas tanker carries only gases or gas mixtures in these tanks, not causing corrosion on cargo tanks walls, the cargo tanks shall be inspected internally at even Class Renewal Survey only (second, fourth, sixth and so forth), provided that it may be assumed on the basis of random checking that the cargo tanks are in satisfactory condition.

Tightness of cargo tanks and domes shall be verified. However, for a vessel of less than fifteen years of age, a separate tightness test may not be required for each tank, provided the examination of the log book raises no doubts as to their tightness.

If results of cargo tanks examination and testing, or the examination of the log book raise any doubts as to the structural integrity or tightness of a cargo tank, or when significant repairs have been carried out, hydraulic or hydro pneumatic testing shall be carried out.

**4.7.2.6 Cargo handling system**

The complete cargo handling system, including valves and other fittings, shall be tested to 1.25 times the design pressure. If the maximum delivery pressure of pumps is less than the design pressure of the piping system, testing to the pumps maximum delivery pressure may be accepted. In such cases, selected expansion bellows shall be dismantled, examined internally and tested to their design pressure to the Surveyor’s satisfaction.

If considered necessary by the Surveyor, insulated cargo gas and liquid pipelines, including valves and their monitoring devices, etc. shall have sections of insulation removed to ascertain the condition of the pipes.

All pressure relief valves shall be opened up for examination, adjusted afterwards, sealed and tested to the Surveyor’s satisfaction.

All cargo pumps, compressors, heat exchangers, cargo booster pumps and cargo vapour pumps, where applicable, and other machinery including their prime movers which are a part of the cargo handling system, shall be opened out for examination, if considered necessary by the Surveyor.

Cargo handling control and safety systems shall be examined, including:

1. cargo tanks level gauging including control, alarm and safety functions (a level gauges, a low level, a high level and overfill alarms);
2. control, alarm and safety systems monitoring the pressure in cargo tanks, cargo piping and hold spaces;
3. monitoring systems of cargo temperature;
4. control, alarm and safety systems of cargo compressors and cargo pumps;
5. emergency shut down valves at shore connections and tanks.

Insulation resistance test of electrical equipment shall be carried out (see 4.5.4).

**4.7.2.7 Thickness measurements and non-destructive testing of cargo tanks**

Thickness measurements of cargo tanks plating may be required, if considered necessary by the Surveyor.

The gauging shall be carried out in at least two places of the bottom, forward and aft tank plating, side and top plating. The remainder of the plating shall be gauged as deemed necessary by the Surveyor, taking into account the results of gauging already carried out.

The extent of thickness measurements may be specially considered, at the Surveyor’s discretion, if coating in tanks is found in satisfactory condition.

In addition to above, the Surveyor may require thickness measurements of any part of the cargo tank structure where sign of wastage is evident, wastage is normally found or where there is doubt as to the condition of the structure in way of insulation. Any parts of the cargo tank structure which are found defective or materially reduced in scantlings shall be made good by materials of approved scantlings and quality.

A non-destructive testing procedure may supplement the examination of cargo tanks during the internal survey of the tanks. The scope and type of examination shall be approved by Register.

If independent tanks (cylindrical under pressure) are fitted, welding seams in critical areas, such as pipe connections, weldings of the fitting to the tank plating such as domes and sumps, tank supports, reinforcement rings, attachment of hollow bulkheads and support of pumps, shall be tested in length of 10% of the total welding seam length.

**4.8 Installations under pressure**

For steam boiler installations, thermal oil heaters and pressure vessels, see Section 6.

**4.9 Hull, hull equipment and machinery requirements - wooden vessels and fibre reinforced plastic vessels**

**4.9.1 The rigidity, i.e. the extent and the type of the Class Renewal Survey for wooden vessels shall be determined according to the vessel’s age, and used type of timber and material for fastenings.**

**4.9.2 For Class Renewal Survey of vessels up to 20 (twenty) years of age the following shall be fulfilled, as far as applicable:**

1. requirements stated in 2.5 and 5.3 shall be fulfilled;
2. any surfaces in contact with rust shall be well scraped and the outside surface of the shell planking, from the light waterline to the covering boards, shall be cleaned and scrapped. Additionally, if considered necessary by attending Surveyor, a sufficient amount of ceiling and timber boards shall be removed. Additionally, if considered necessary by the Surveyor, a sufficient amount of the outer shell planking, inner sparing and metal sheathing, if any, shall be removed to enable a close examination of the structure;
3. the sheer strake planking shall be examined and, if considered necessary by attending Surveyor, tested by drawing a sufficient number of wooden plugs, or by boring if no wooden plugs are fitted. The holes resulting from the latter shall subsequently be closed by tree nails or bolts;
4. particular attention shall be given to the planking on the upper deck or weather deck. Special attention shall be given to the planking adjacent to pillars and areas near windlasses and hatchway openings, as well as to the areas near deck transverses and longitudinals. When necessary...
metal sheathing in chain locker shall be examined, and if considered necessary by attending Surveyor, a certain amount of such metal sheathing shall be removed in order to establish the condition of the structure below, in extent as deemed necessary by the attending Surveyor;

.5 if examination reveals rot or decay due to woodworm, the affected areas shall be renewed. Planks showing evident signs of wear shall be bored and renewed either wholly or partially when the deterioration exceeds 20,0 mm or if it is worn by 25% or more from its required nominal thickness;

.6 where the keel and centre keelson are connected by iron fastenings, a sufficient number of such fastenings shall be drawn to check their condition (all worn out fastenings shall be renewed), where this is impracticable, additional fastenings, as required by the Surveyor shall be fitted in the connection of keel with centre keelson, of stem and sternpost with aprons and inner sternposts, and also in the connection of other main structural members;

.7 particular attention shall be given to the examination of breast hooks, frames, beams (particularly at their ends), knees, hawse timbers, knight heads, transoms and all fore and aft structural members;

.8 where steel brackets are not sticking well enough to the inner ceiling or beams, they shall be stuck by hammers;

.9 bulwarks, bulwark stays, guard-rails and similar fittings, and superstructures shall, in general, be examined in order to check their condition;

.10 cargo holds, bulkheads and bulkhead openings shall be examined;

.11 the watertightness of hatch covers shall be checked by testing with water spilling;

.12 engine foundations in the machinery spaces shall be examined. Additionally all structural elements made of steel (including parts of engine foundations) shall be well cleaned and the rust has to be removed before painting;

.13 masts, mast’s armature, and standing and loose rigging shall be visually examined, as well as the fastening of the mast to the structure;

.14 anchors, chain-cables, shackles, hooks, bolts and all other similar arrangements used for connecting anchors to anchor chains shall be visually inspected for wear and tear. Any length of chain-cable which is found to be reduced in mean diameter at its most worn part by 12 per cent or more from its required nominal diameter should be renewed;

.15 the rudder shall be thoroughly examined and, if deemed necessary by the Surveyor, it shall be lifted for the examination of the pintles. Rods, chains, ropes, sheaves, pins and rollers related to steering gear shall be examined for wear and tear;

.16 main and auxiliary steering gears shall be carefully examined and tested under working conditions. If considered necessary by the Surveyor, they shall be opened up in extent deemed appropriate;

.17 ropes intended for mooring and towing shall be checked.

In addition to aforementioned examination of main and auxiliary machinery installations in accordance with the requirements stated in .8 shall be fulfilled, in extent as far as applicable.

NOTE: Extent of survey and overhauling of machinery shall be determined by the Surveyor depending on the general condition, number of working hours from the log-book, type of the installation, records from previous surveys, and results of testing under working conditions.

4.9.3 For Renewal survey of vessels older than 20 (twenty) years, the following shall be fulfilled, as far as applicable:

.1 requirements stated in 4.9.2 shall be fulfilled.

.2 nails, bolts, etc. shall be drawn up and examined, but in no case in amount lesser than:
   a) two bolts connecting keel with centre keelson;
   b) one bolt from the keelson-scarfs;
   c) two bolts from the horizontal brackets, starboard and portside, and two bolts from the vertical brackets, starboard and portside;
   d) two nails or bolts from butts near the keel on each side of the vessel, as well as two nails or bolts from butts of the outside planking, starboard and portside;

.3 several lengths of covering boards, waterways, as well as inner waterways shall be removed as considered necessary by the Surveyor, in order to carefully check the condition of the timber in way of the ends of beams and frames;

.4 superstructures and erections shall be scraped, particularly in those positions which are liable to greater deterioration, and parts shall be removed as required for renewal and/or repair;

.5 the heel of the mast shall be checked, as well as its penetrations through decks (one or two wedgings shall be removed). Visual inspection of the mast shall be performed in order to establish possible transverse cracks. If visual examination or testing by sounding of the mast reveals woodworm or other holes, not affecting the strength of the mast, they shall be closed, in order to prevent penetration of the water and possible rotting or decay of the mast. Standing and loose rigging, as well as mast’s armature shall be dismantled if considered necessary by attending Surveyor. Sails and spare sails shall be examined;

.6 the windlass and other items of the deck machinery shall be examined and dismantled as deemed necessary by the Surveyor.

4.9.4 For ships with hull made of plywood (stiffened wood) or with wooden hull covered with protective lining or covering, the following shall be carried out and, where necessary, repairs shall be carried out to the Surveyor’s satisfaction:

.1 attention shall be given to the condition of edge protection as well as of protective lining and also to establish cracks where water may enter under protective lining/covering;

.2 establishing possible de-lamination between layers.

4.9.5 For fibre-reinforced plastic vessels the survey shall be performed to find possible alterations of surface condition or damages from causes such as chafing and lying on the ground. Where the survey reveals structural defects, repairs shall be carried out to the Surveyor’s satisfaction. The Surveyor may request for grinding of suspect areas or for
taking of hull structure samples as well as for measuring of the moist percentage in hull structure.

Special attention shall be given to the positions where high structural strain is possible, corners of openings and other structural discontinuities.

5 BOTTOM SURVEY

5.1 General

Bottom Survey includes the examination of underwater part of the vessel’s hull plating including appendages, rudders, propeller shafts / propellers, shall plating river chests and penetrations for inlets and outlets including related items. This examination may be carried out with the vessel either on slipway (or in dry dock) which is considered as Docking Survey or, as an alternate examination, afloat, which is considered as an in-water survey.

The Owner shall notify the Register whenever the outside of the vessel’s bottom, bilge and side shell including related items can be inspected on a slipway or in dry dock.

5.2 Docking Survey

5.2.1 Inland navigation vessels shall, in general, be subjected to a Bottom Survey once during Class term. Inspection of the outside of vessel’s bottom, bilge and side shell including related items should normally be carried out with the vessel placed on a slipway or in dry dock. As stated above, consideration may be given to alternate examination while the vessel is afloat as an In-water Survey, subject to provisions of 5.4.

Furthermore, the Surveyor shall be present at each Bottom Survey carried out as addition to Bottom Survey specified by the Register.

5.2.2 The vessel shall be examined in dry-dock or on slipway as a part of Intermediate Survey in following cases:
- the vessel’s shell is riveted below the light waterline, at the Surveyor’s discretion;
- the vessel’s age exceeds 20 years, at the Surveyor’s discretion;
- the vessel’s age exceeds 20 years and the type notation granted is Tanker for transport of dangerous goods;
- the vessel is granted with the range of navigation IWW-1.2 or IWW-2.0, at the Register’s discretion, when vessels operates regularly in restricted maritime stretches of water or lakes (salty or brackish waters).

5.2.3 The survey covers an examination of the bottom, bilge and side shell plating, including any attachments, the rudder, the scupper and water drain pipes, including their closures.

The vessel shall be placed in dry dock or on a slipway at a sufficient height above the dock floor or the ground for examination of bottom and side plates of the shell plating, rudder(s), river inlets and outlets, the scuppers, water drain pipes, etc.

It may be necessary to clean the bottom and outer shell and/or remove rust from some areas to the Surveyor’s satisfaction. If necessary proper staging shall be erected for this examination. It may be required to remove cradles for examination of the bottom plating.

5.2.4 Condition of river inlets and outlets shall be checked during each Dry docking Survey and shall be opened up and internally examined once within a Class term.
5.2.6 For surveys of propeller(s) and propeller shaft(s), see 4.6.

5.3 Docking Survey of hull for wooden vessels and fibre reinforced plastic vessels

5.3.1 The Docking Survey of hull for wooden vessels consists of:

1. examination of the condition of the outside planking and its caulking on each side of the vessel, amidships and at the ends, in the vicinity of the waterline and near to the keel (permissible deterioration of the planking is 25% of its nominal thickness). At the discretion of the attending Surveyor the metal sheathing shall be renewed either entirely or in the deteriorated areas;

2. examination of the condition of the keel, false keel, stem, and sternpost, with a special attention to parts of the structure liable to excessive corrosion or to deterioration from causes such as chafing and lying on the ground. If the underwater body is protected with fibre-glass or other similar materials the Surveyor shall examine adhesion of such material to the shell planking. The Surveyor shall also establish if there are any cracks in before mentioned protection of the underwater body through which the water could penetrate to shell planking;

3. during every regular Docking Survey examination of all suction and discharge valves, including their fastenings to the hull and gratings shall be performed. When Docking Survey is performed concurrently with the Class Renewal Survey, all suction and discharge valves, including their fastenings to the hull and gratings shall be dismantled, opened up and examined. On vessels operating also in salty waters and having cast iron valves on inlets/outlets, or if they are of an unapproved type, they shall be opened up for examination at every regular Docking Survey;

4. examination of the bilge system, which shall be opened up, examined and tested under working conditions, as deemed necessary;

All river water connections, sludge boxes, strainers and valves related to the system mentioned before shall be opened up and examined. The bilge and ballast piping shall be tested. Additionally the underwater part of the hull shall be surveyed for possible appearance of osmosis.

5.4 In-water survey

5.4.1 In-water survey of the vessel’s bottom may be conducted upon preliminary agreement with the Register and under the below conditions in order to ensure that the information obtained is as reliable as that obtained by surveys in a dry dock or on slipway.

5.4.2 The vessel should be in light vessel condition and the in-water visibility shall be clear and the cleanliness of the hull below the waterline shall be free from fouling in order to permit meaningful examination which allows the Surveyor and diver to determine the condition of the plating, appendages and the welding. Sufficient clearance between the vessel’s bottom and riverbed shall be ensured.

The Register shall 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.

5.4.3 The equipment, procedure for observing and reporting the survey shall be discussed with the parties involved prior to the in-water survey, and suitable time shall be allowed to permit the diving company to test all equipment beforehand.

The survey shall be carried out by qualified divers employed by a firm approved by the Register or organisation recognised by the Register under the supervision of a Surveyor.

The Surveyor shall be satisfied with the method of pictorial presentation such as underwater camera with monitor which shall offer reliable technical information in order to enable the Surveyor to examine the areas or parts concerned.

Good two-way communication between the Surveyor and the divers shall be provided.

5.4.4 Upon completion of the survey the divers shall submit to the Surveyor a detailed report including recorded materials which are suited for picture, video and voice reproduction.

5.4.5 In the case of grounding is assumed to have taken place, the appointed Surveyor may request additional inspection hull structure from inside.

If the in-water survey reveals deterioration that requires early attention i.e. where vessel’s structural integrity may be endangered prior to next dry-docking or damage which can be assessed reliably only in dry-dock or on a slipway or require immediate repair, the vessel shall be dry-
docked in order that detailed survey can be undertaken and the necessary repairs carried out.

6  INSTALLATIONS UNDER PRESSURE

6.1  General

All boilers, thermal oil heaters and hot water units intended for essential services including auxiliary boilers used exclusively for non-essential services shall be surveyed externally and internally at Intermediate Survey and Class Renewal Survey.

Occasional inspections may be carried out in the case of repairs, maintenance and renewal works during which the Surveyor may require hydraulic tests or extraordinary inspections.

6.2  Boilers

6.2.1  External examination

6.2.1.1  External examination of entire boiler, super heater and economiser including its valves and all relevant fittings, pumps, piping, insulation, supports and fastening arrangements, control and regulating systems and its safety equipment shall be carried out under working conditions.

6.2.1.2  During external examination of boiler, special attention shall be given to the following:

1. the entire boiler plant shall be examined, including possible leakages and condition of insulation, lighting and labelling;
2. the boiler mountings and safety valves including remote controls for the shut-off and discharge valves;
3. all safety, control and signalling devices shall be examined and tested so far as practicable;
4. the leakage monitors for heaters;
5. the fuel oil burning system shall be examined under working conditions, fuel tank valves and pipes, and oil piping between pumps and burners, including emergency switch-off devices (pumps, oil firing) and the safety switch-off devices for the oil burner shall, in general, be examined.

6.2.2  Internal examination

6.2.2.1  If considered necessary by the Surveyor, the boiler shall be cleaned on the water-steam and fire sides and, if required, its outside surfaces shall be uncovered as well, so that all walls subject to pressure may be carefully examined.

If due to construction of boiler and limited size of the internal spaces, such as for small boilers and/or narrow internal spaces the complete internal examination is not practicable, hydraulic test may be required at the Surveyor’s discretion depending on general condition of the boiler.

6.2.2.2  Subject to the results of visual inspection the Surveyor may require non-destructive examinations for detection of possible defects and thickness measurements of the boiler walls using a recognized gauging method.

Upon such examination results, the permissible working pressure of the boiler shall be determined in agreement with the Register.

Safety valves shall be adjusted to lift at a pressure 1.03 time the design pressure.
6.2.3 Steam pipes – survey requirements

6.2.3.1 Steam pipes shall be surveyed 10 years after the date of build/installation and subsequently at every Class Renewal Survey. At each survey a selected number of main steam pipes, including auxiliary steam pipes which are over 76,0 mm of external diameter and have bolted joints shall be removed for internal examination, and shall be hydraulically tested to 1.5 times the working pressure. If these selected pipes are found satisfactory, the remainder need not be tested. So far, as is practicable, the pipes shall be selected for examination and hydraulically tested in rotation, so that in the course of surveys all sections of the pipeline will be tested.

6.2.4 If steam pipes described above have instead of bolted, welded joint between the lengths of pipe and/or between pipes and valves, the welds shall be examined and if considered necessary by the Surveyor, crack detected. Pipe ranges having welded joints shall be hydraulically tested to 1.5 times the working pressure. Where lengths having ordinary bolted joints are fitted in such pipe ranges and can be readily disconnected, they shall be removed for internal examination and hydraulically tested to 1.5 times the working pressure.

6.2.4.1 Steam pipes in tanks shall be examined and hydraulically tested so far as practicable. Condition of insulation shall be examined, and if considered necessary by the Surveyor partial or complete renewal of insulation may be required.

6.3 Thermal oil heaters

6.3.1 Thermal oil heaters shall be surveyed externally and functionally tested while in operation at Intermediate Survey and Class Renewal Survey where proof of continued usability of thermal oil done by an appropriate testing institution, shall be furnished. Tightness and pressure test of the whole plant to the admissible working pressure shall be performed at intervals of 1 years, counting from commencement of initial operation and possibly in connection with a Class Renewal Survey. Following repairs and renewals of plant components exposed to pressure, a pressure test shall be carried out to 1.5 times the admissible working pressure.

6.3.2 During external examination of thermal oil plant, special attention shall be given to the following:

.1 the entire thermal oil plant shall be examined, including checks for possible leakages and condition of insulation, lighting and labelling;

.2 all safety, control and signalling devices including remote controls for the shut-off and discharge valves shall be examined and tested so far as practicable;

.3 the leakage monitors for heaters;

.4 emergency switch-off devices (pumps, oil firing) and the safety switch-off devices for the oil burner shall, in general, be examined.

NOTE: Reference shall be made to the test reports on the annual checks to be performed by an appropriate testing institution for continued usability of the thermal oil. This shall be confirmed in the report.

6.3.3 Every 10 years, the heating surfaces and combustion chamber, shall be inspected internally for corrosion, contamination, deformations and leakages.

6.4 Pressure vessels

6.4.1 Pressure vessels shall be examined externally and internally every 10 years, possibly in connection with Class Renewal Survey.

Pressure vessels for which pressure, in bars, multiplies cubic capacity, in litres, product is less than or equal to 200, shall be surveyed on the occasion of checking of the pertinent piping system.

6.4.2 All air receivers for essential services including their mountings, valves and safety devices shall be cleaned internally and examined internally and externally at Class Renewal Survey.

If internal examination of pressure vessels is not practicable or cannot be satisfactorily examined and if their unobjectionable condition cannot be clearly stated during the internal examination, examination by an approved non-destructive test and/or hydraulic pressure testing to the test pressure 1.5 times the maximum permissible working pressure shall be carried out. If the maximum permissible working pressure is less than 2.0 bar, then the test pressure shall be at least 1.0 bar above the maximum permissible working pressure.

Anyhow, the test pressure shall not exceed the test pressure applied during the first inspection of the pressure vessel. Pressure vessels manufactured in accordance with non-class standards shall be tested according to that standards.

Following a hydraulic pressure test, the air receivers and/or bottles shall be carefully dried. Records from inspection/testing of pressure vessels shall be kept on board.

6.4.3 CO₂ cylinders and other gas cylinders for fire extinguishing purposes including vessels for powder extinguishers shall be submitted to periodical survey according manufacturer instructions or applicable Standards.

Reports relative to these surveys carried out by an approved or recognised company have to be submitted to the Surveyor. Air receivers in hydraulic or pneumatic control systems shall be examined during maintenance and repairs at the system.

Air receivers with a product of pressure by cubic capacity \( p \cdot V \geq 1000 \) (\( p \) is the pressure, in [bar], \( V \) is the
volume, in [litre]) shall be internally inspected at least once during each class renewal.

Depending on the findings the intervals between surveys as referred to may be reduced,

**NOTE:** In the case when flag Administration requirements differ from aforementioned, then specific Administration requirements shall be applied.

### 7  THICKNESS MEASUREMENTS

#### 7.1  General

**7.1.1** Thickness measurement is one of the most important part of surveys to be carried out in order to maintain the class.

Objectives of thickness measurements shall determine level of wastage of structure scantling in order to check whether the values stipulated in the *Rules* are kept, to determine condition of the hull structural integrity, and to determine an extent of the possible repairs, renewals or reinforcement of the hull structure on the base of analysis of these measurements taking into account the admissible corrosion tolerances.

Depending on the local conditions of the structure, limits of wastage of hull construction are classified and determined by *Register* by criteria on global and buckling strength and by criteria on local strength and pitting.

If the criteria are not met, repairs, renewal or reinforcements shall be carried out.

Thickness measurements shall be carried out according to recognised methods by a qualified and approved personnel or companies independent from the Owner and approved by the *Register*. The accuracy of the equipment shall be proven to the *Surveyor* as required.

For approval of service suppliers see requirements stated in the *Rules for the Classification of Sea Going Ships, Part 1 – General Requirements, Chapter 4 – Approval of manufacturers and service suppliers*.

Thickness measurements are not required for Class Renewal Survey I unless severe corrosion has been observed during that survey. Where special reasons exist such as severe corrosion, the *Surveyor* may demand thickness measurements to be carried out already on the occasion of class Renewal I, also outside the area of $0.5 \cdot L$ amidships. The same applies in the case of conversion or repair of a vessel.

**7.1.2** Prior to the commencement of any part of the survey a survey planning meeting shall be held between the attending *Surveyor*(s), the Owner’s Representative and the thickness measurement company operator to ensure the safe and efficient execution of the surveys and thickness measurements to be carried out on board.

The scope of thickness measurement as well as the reporting shall be fixed between the *Surveyor*, vessel's Owners representative and the thickness measurement company.

The thickness measurements shall be witnessed by the *Surveyor* and the attendance of the *Surveyor* shall be recorded. This requires the *Surveyor* to be on board, while the gaugings are taken, to the extent necessary to control the process.

**7.1.3** 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. Thickness measurements of internals may be specially considered by attending *Surveyor* if the hard protective coating is in GOOD condition.
Chapter III - SURVEYS

Part 1 – Classification and Surveys

In case of pitting found with intensity is 20% or more, thickness measurements shall be extended in order to determine the actual plate thickness out of the pits and the depth of the pits. Where the wastage is in the substantial corrosion range or the average depth of pitting is 1/3 or more of the actual plate thickness, the pitted plate shall be considered as a substantially corroded area.

7.1.4 In preparation for survey and thickness measurements and to allow for a thorough examination, safe access to the structure, adequate and safe illumination and ventilation shall be provided, and all spaces shall be cleaned including removal from surfaces of all loose accumulated corrosion scale (see 1.5 as well).

7.1.5 The Surveyor may require randomly re-check measurements or more detailed measurements to be performed in his presence if considers necessary. Thickness measurements of structures in areas where close-up surveys are required shall be carried out simultaneously with the close-up survey. The requirements for close-up survey of tank vessels are stated in Table 7.2-4.

Upon completion of the thickness measurements, the Surveyor should confirm that no further gaugings are needed, or specify additional gaugings. The attending Surveyor shall also verify and keep, until review of the final thickness measurement report is completed, a copy of the preliminary thickness measurement report signed by the operator. The Surveyor shall review the final thickness measurement report and countersign the cover pages.

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

When a survey is split between different survey stations, a report shall be made for each portion of the survey.

A list of items examined and/or tested and an indication of whether the item has been credited, shall be made available to the Owner’s representative and next attending Surveyor(s), prior to continuing or completing the survey.

7.2 Scope of measurements

7.2.1 General

Scope and extent of thickness measurements depends on the vessel’s type and age at time of Class Renewal Survey.

The thickness measurements includes:
- measurements of the hull structure;
- measurements of suspect areas as defined in 1.2.21;
- additional measurements on areas determined as affected by substantial corrosion as defined in 1.2.19.

7.2.2 Shell plating and primary/secondary supporting members

The thicknesses of the hull plating such as shell plating, deck plating, bulkheads plating, etc. and primary and secondary supporting members such as longitudinal girders, transversal frames, deck beams, pillars, etc. shall be checked by thickness measurements at Class Renewal Survey II and all subsequent ones.

The scope of measurements and number of points to be measured is left to the Surveyor’s discretion depending of the general vessel’s maintenance condition.

In general, the minimum requirements for thickness measurements on the occasion of Class Renewal Surveys are defined in Table 7.2-2 and 7.2-3 depending on the vessel’s Class Renewal Survey number (I, II, III, IV and subsequent) while Table 7.2-1 provides interpretations for the application of the requirements for thickness measurements related to the locations and number of points to be measured.

Transverse section from Table 7.2-2 and 7.2-3, which includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom, inner side, hopper side, top wing side and longitudinal bulkhead, where fitted, shall be chosen where largest corrosion rates are suspected to occur or are found by deck plating measurements. For transversely framed vessels, a transverse section includes adjacent frames and their end connections in way of transverse sections.

In the case of ballast tanks, if applicable, where major corrosion damages occur, the thickness measurements of ballast tanks structural elements shall be carried out.

7.2.3 Reduction of thickness measurement scope

The extent of thickness measurements may be waived or reduced by Surveyor after satisfactory visual examination comparing with those stated in Table 7.2-2 and 7.2-3 if, during the close-up survey parts of hull structure are found in good condition and no structural diminution are found and the protective coating, where applied, continues to be effective.

If structure is coated and the coating is found to be in GOOD condition, the Surveyor may accept a reduced scope of thickness measurements in corresponding areas.

7.2.4 Extension of thickness measurement scope

The Surveyor may extend the scope of thickness measurements as deemed necessary and especially in areas affected by substantial corrosion. If thickness measurements indicate substantial corrosion as defined in 1.2.19, the number of thickness measurements shall be increased in order to determine the extent of substantial corrosion.

The number of additional thickness measurements shall be as follows:

1. for plating, 5 points pattern over 1,0 m² of suspect area and adjacent plates shall be measured;
2. for stiffeners, 3 measurements in line across web and face plate in suspect area.

Rules for the Classification of Inland Navigation Vessels
June 2018
Table 7.2-1
Interpretations of the requirements for the locations and number of points to be measured

<table>
<thead>
<tr>
<th>Item</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected plates on deck, tank top, bottom, inner bottom and side.</td>
<td>“Selected” means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion.</td>
</tr>
<tr>
<td>All deck, tank top, bottom, inner bottom and side plates.</td>
<td>At least two points on each plate to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion.</td>
</tr>
<tr>
<td>Transverse section</td>
<td>Measurements to be taken on all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, longitudinal bulkheads, inner bottom and hopper. One point to be taken on each plate. Both web and flange to be measured on longitudinals, if applicable. All transversal section plates including stiffeners and brackets shall be measured.</td>
</tr>
<tr>
<td>Bulkheads</td>
<td>“Selected bulkheads” means at least 50% of the bulkheads.</td>
</tr>
<tr>
<td>Selected internal structure such as floors, longitudinals, transverse frames, web frames, deck beams and girders.</td>
<td>The internal structural items to be measured in each space internally surveyed shall be at least 20% within the cargo area and 10% outside the cargo area.</td>
</tr>
</tbody>
</table>

Table 7.2-2
Minimum requirements to thickness measurement at Class Renewal Survey – general cargo vessels and other vessels

<table>
<thead>
<tr>
<th>Class Renewal Survey I (age ≤ 5)</th>
<th>Class Renewal Survey II (5 &lt; age ≤ 10)</th>
<th>Class Renewal Survey III (10 &lt; age ≤ 15)</th>
<th>Class Renewal Survey IV and all subsequent surveys (age &gt; 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical and suspect areas throughout the vessel, as required by the Surveyor</td>
<td>Critical and suspect areas throughout the vessel, as required by the Surveyor</td>
<td>Within the cargo length area or 0,5·L amidships:</td>
<td>Within the cargo length area or 0,5·L amidships:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– 1 transverse section,</td>
<td>– 3 transverse section:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– selected deck plates,</td>
<td>– all deck plates, stringer plates, hatch coamings and shear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stringer plates, hatch coamings and</td>
<td>strake 1);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shear strake 1);</td>
<td>– all side/inner side plates;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– selected side/inner side plates;</td>
<td>– selected bottom/inner bottom plates;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– selected bottom/inner bottom plates.</td>
<td>– selected transverse and longitudinal cargo hold bulkheads</td>
</tr>
<tr>
<td>Outside the cargo length area:</td>
<td></td>
<td>collision bulkhead, forward machinery space bulkhead, aft peak bulkhead 13, 23;</td>
<td>– collision bulkhead, forward machinery space bulkhead, aft peak bulkhead 13, 23;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shell plating in way of overboard</td>
<td>shell plating in way of overboard discharges as considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td>discharges as considered necessary by</td>
<td>necessary by the Surveyor;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the Surveyor;</td>
<td>In engine room 23: river chests plating, river water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In engine room 23: river chests</td>
<td>manifold, duct keel or pipe tunnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plating, river water manifold, duct</td>
<td>plating and internals;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>keel or pipe tunnel plating and</td>
<td>– selected internal structure such as ballast tank, floor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>internals;</td>
<td>and longitudinals, transverse frames, web frames, deck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– selected internal structure such as</td>
<td>beams, girders, etc.;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ballast tank, floor and longitudinals,</td>
<td>– all deck, bottom and side plates;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>transverse frames, web frames, deck</td>
<td>– internals in fore and aft peak tanks;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>beams, girders, etc.;</td>
<td>– selected transverse and longitudinal bulkheads outside cargo hold area 13, 33;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– selected deck, bottom &amp; side plates;</td>
<td>– representative exposed superstructure deck plates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– internals in fore peak tank.</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Including plates and stiffeners.
2) Measurements may be waived or reduced after satisfactory visual examination, when such bulkheads form the boundaries of dry void spaces or river chests, etc. are found in GOOD condition.
3) For vessels of length less than 40.0 m in length, the number of transverse sections may be reduced at the Surveyor’s discretion.
### Table 7.2-3

Minimum requirements to thickness measurement at class renewal survey – tank vessels

<table>
<thead>
<tr>
<th>Class Renewal Survey I (age ≤ 5)</th>
<th>Class Renewal Survey II (5 &lt; age ≤ 10)</th>
<th>Class Renewal Survey III (10 &lt; age ≤ 15)</th>
<th>Class Renewal Survey IV and all subsequent surveys (age &gt; 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>– critical and suspect areas throughout the vessel, as required by the Surveyor; – measurement for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 7.2-4.</td>
<td>Same as for Class Renewal Survey I and in addition: <strong>Within the cargo length area or 0.5L amidships:</strong> – 1 transverse section; – selected deck/trunk plates; – selected side/inner side plates; – selected bottom/inner bottom plates.</td>
<td>Same as for Class Renewal Survey I and in addition: <strong>Within the cargo length area or 0.5L amidships:</strong> – 2 transverse sections; – all deck/trunk plates; – all side/inner side plates; – selected bottom/inner bottom plates; – selected transverse and longitudinal cargo tank bulkheads.</td>
<td>Same as for Class Renewal Survey I and in addition: <strong>Within the cargo length area or 0.5L amidships:</strong> – 3 transverse section; – all deck/trunk plates; – all side/inner side plates; – all bottom/inner bottom plates; – all transverse and longitudinal cargo tank bulkheads.</td>
</tr>
<tr>
<td><strong>Outside the cargo length area:</strong> – collision bulkhead, forward machinery space bulkhead, aft peak bulkhead; – shell plating in way of overboard discharges as considered necessary by the Surveyor; – in engine room: river chests plating, river water manifold, duct keel or pipe tunnel plating and internals.</td>
<td><strong>Outside the cargo length area:</strong> – collision bulkhead, forward machinery space bulkhead, aft peak bulkhead; – shell plating in way of overboard discharges as considered necessary by the Surveyor; – in engine room: river chests plating, river water manifold, duct keel or pipe tunnel plating and internals;</td>
<td><strong>Outside the cargo length area:</strong> – all transverse and longitudinal cargo tank bulkheads outside cargo hold area; – representative exposed superstructure deck plates.</td>
<td><strong>Outside the cargo length area:</strong> – collision bulkhead, forward machinery space bulkhead, aft peak bulkhead; – shell plating in way of overboard discharges as considered necessary by the Surveyor; – In engine room: river chests plating, river water manifold, duct keel or pipe tunnel plating and internals; – selected internal structure such as ballast tank, floor and longitudinals, transverse frames, web frames, deck beams, girders, etc.; – all deck, bottom and side plates; – internals in fore and aft peak tanks; – selected transverse and longitudinal bulkheads outside cargo hold area; – representative exposed superstructure deck plates.</td>
</tr>
</tbody>
</table>

**Notes:**
1) Including plates and stiffeners.
2) Measurements may be waived or reduced after satisfactory visual examination, when such bulkheads form the boundaries of dry void spaces or river chests, etc. are found in GOOD condition.
3) For vessels of length less than 40.0 m in length, the number of transverse sections may be reduced at the Surveyor’s discretion.

### Table 7.2-4

Requirements for close-up survey at class renewal survey – tank vessels

<table>
<thead>
<tr>
<th>Class Renewal Survey I (age≤55)</th>
<th>Class Renewal Survey II (5&lt;age≤10)</th>
<th>Class Renewal Survey III (10&lt;age≤15)</th>
<th>Class Renewal Survey IV and all subsequent surveys (age &gt; 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>– selected deck plates in 1 tank for survey from inside of the tank; – selected deck longitudinal/brackets in 1 tank; – 1 transverse section selected in 1 representative cargo tank.</td>
<td>– selected deck plates in 2 tanks for survey from inside of the tank; – selected deck longitudinals/brackets in 2 tanks; – selected bulkheads for survey of upper and lower parts; – 2 transverse sections selected in 2 representative cargo tanks; – selected plates and stiffeners in 1 representative ballast tank.</td>
<td>– selected deck plates in 4 tanks for survey from inside of the tank; – selected deck longitudinals/brackets in 4 tanks; – all bulkheads for survey of upper and lower parts; – 3 transverse sections selected in 3 representative cargo tanks, including all transverse section in 1 representative cargo tank; – selected plates and stiffeners in all ballast tanks.</td>
<td><strong>Within the cargo length area or 0.5L amidships:</strong></td>
</tr>
</tbody>
</table>

**Notes:**
1) Including plates and stiffeners.
2) For vessels less than 40.0 m in length, the number of transverse sections may be reduced at the Surveyor’s discretion.
3) Transverse bulkhead lower part means lower part of bulkhead up to 0.25 times vessel’s depth or 1.0 m above the lower stringer, whichever is the greater (stringers, stiffeners and adjacent structural members included).
4) Transverse bulkhead upper part means upper part of bulkhead from 0.75 times vessel’s depth or 1.0 m underneath the upper stringer, whichever is the greater (stringers, stiffeners and adjacent structural members included).
7.2.5 Hull equipment – anchor and chain

The cross sectional areas of the anchor chain cables shall be determined at Class Renewal Survey II and all subsequent ones. Three links per length of 27.5 m to be measured at the ends of the links where the wear is the greatest and the mean diameters shall be determined. Any length of chain cable which is found to be reduced in mean diameter over 12% from its nominal diameter shall be renewed.

The weights of the anchors shall be checked at Class Renewal Survey III and all subsequent ones. If the weight of the anchor has been reduced by 10% or more from its nominal weight it shall be renewed.

7.3 Acceptance criteria of measured thicknesses

7.3.1 General

This Head prescribes measured thicknesses acceptance criteria for:

1. thickness diminution of hull plating such as shell plating, deck plating, bulkheads plating, etc.;
2. thickness diminution of supporting members such as longitudinal girders, transverses, deck beams, floors, pillars, etc.

Acceptance criteria is concerned to measured thicknesses and it shall be distinguished between pitting diminution as local diminution and plating/supporting members’ diminution.

If thickness measurements result in corrosion and wear values exceeding those stated in the following, the respective hull structural members have to be renewed.

Furthermore, the applicable criteria on longitudinal and buckling strength may be decided by Register, if deemed necessary, on a case by case basis.

7.3.2 The maximum permissible thicknesses diminution shall be considered in three different criteria which may vary depending on the extent of area affected by corrosion. These criteria may be as follows:

7.3.2.1 LP – localized part

Thickness diminution of a localized part of a single construction part such as plate or supporting member (for example, grooving of a plate or a stiffener or a local severe corrosion). It shall not be confused with pitting.

If the values measured are greater than permissible diminution for a localized part, this localized part of a single plate or supporting member shall be repaired or renewed. In any case, the criterion of thickness diminution shall be considered for the corresponding single construction part SP.

7.3.2.2 SP – single construction part

Single plate or supporting member considering the average condition of members.

For each single construction part, thicknesses are measured at several positions and the average value of these measurements shall be within permissible limits. If the average value is greater than permissible diminution, single construction part shall be repaired or renewed.

For a single construction part which contribute to the hull girder longitudinal strength the criteria in 7.3.2.3 shall be considered.

7.3.2.3 ZP - zone

Transverse section including all longitudinal members contributing the longitudinal strength divided into deck zone, neutral axis zone and bottom zone.

Each of deck zone, neutral axis zone and bottom zone shall be assessed separately.

The sectional area diminution of a certain transverse section zone, expressed as a percentage of the relevant as built sectional area, shall fulfil the criteria of acceptable diminution for that transverse section zone.

If the acceptance criteria of diminution for a certain transverse section zone are not fulfilled, then most worn single construction parts shall be replaced as found necessary by the attending Surveyor in order to obtain after their replacement an increased sectional area of the transverse section zone fulfilling the relevant criteria.

7.3.3 Acceptance criteria for thickness diminution based on gross scantling approach

7.3.3.1 Acceptance criteria for thickness diminution based on gross scantling approach determines limits of wastage of hull plating and supporting members.

These limits and maximum permissible thicknesses diminutions are given in Table 7.3-1. In general, the minimum acceptable thickness, \( t_{\text{min}} \), shall be calculated from the following:

\[
 t_{\text{min}} = \left(1 - \frac{W}{100}\right) t_{\text{rule}}, \quad [\text{mm}] 
\]

(7.3.3-1)

where:

- \( t_{\text{rule}} \) = the rule thickness, or if the rule thickness is not available, the as-built thickness, [mm];
- \( W \) = a maximum percentage of acceptable wastage.

Each structural member shall be assessed according to criteria stated in 7.3.2, as far as applicable, and on the base of its contribution in local strength, global strength and buckling strength. Criteria on pitting shall be assessed as well. (see 7.3.5).

7.3.3.2 Criteria LP, SP and ZP take into consideration aspects of the local strength, integrity of the hull structure and overall strength of hull girder. In general, the values given in Table 7.3-1 are applicable within the cargo area structure of vessels having a length equal or greater than 90,0 m.

For vessels with a length less than 90,0 m, values of acceptable wastage can be increased by 5%, except for those of bottom and deck zones. For structure outside the cargo area, values can be increased by 3% as well.

7.3.3.3 If the criterion LP as stated in Table 7.3-1 is not fulfilled, taking into consideration very limited and local aspects of the localized part such as local severe corrosion or grooving of a plate, the worn part of the localized part of a single construction member such as single plate or supporting member shall be repaired or renewed.
### Table 7.3-1
Maximum permissible thicknesses diminutions – all vessels

<table>
<thead>
<tr>
<th>Zone</th>
<th>Description of Items</th>
<th>LP (localized part)</th>
<th>SP (single part)</th>
<th>ZP (zone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deck zone</td>
<td>- deck plating, hatch coaming plating and stringer plate;</td>
<td>30%</td>
<td>25% or 15% 2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- deck and shear strake longitudinal, deck beams;</td>
<td></td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>- trunk plating longitudinal;</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- inner side upper strake longitudinal;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- deck girders;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkhead upper strake longitudinal;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- hatch coaming stiffeners and stays.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- deck transverse web frames (webs only);</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- deck transverse web frames brackets and stiffeners.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- deck transverse web frames (flanges only).</td>
<td>20%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Neutral Axis Zone</td>
<td>- side and inner side shell plating;</td>
<td>30%</td>
<td>25% or 15% 2)</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkhead plating.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- side and inner side shell longitudinal/stringers;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkhead longitudinal/stringers.</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Bottom zone</td>
<td>- bottom shell and bilge strake plating;</td>
<td>30%</td>
<td>25% or 15% 2)</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkhead lower strake and inner side lower strake;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- inner bottom plating.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- bottom and bilge longitudinal;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkhead lower strake and inner side lower strake longitudinalities;</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- inner bottom longitudinals;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- bottom girders;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- bottom transverse web frames/floors (webs only);</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- bottom transverse web frames/floors brackets and stiffeners.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- bottom transverse web frames/floors (flanges only).</td>
<td>20%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Other structure</td>
<td>- side frames including brackets/stiffeners;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- side shell web frames (webs only) including brackets/stiffeners;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkheads brackets and vertical stiffeners;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkheads web frames (webs only) including brackets/stiffeners;</td>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- transverse bulkheads plating including stringer webs and stiffeners;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- expansion tank plating and stiffeners, cross tie (webs only);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- hatch coaming plating 3, hatch cover plating and stiffeners.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- side shell frames and web frames (flanges only);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- longitudinal bulkheads web frames (flanges only);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- cross tie (flanges only) including brackets/stiffeners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- transverse bulkheads stringer flange.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1) Including webs and flanges.
2) In the case of transverse framing permissible wastage is maximum 15%.
3) If continuous, see Deck zone, hatch coaming plating.

### 7.3.4
If the criterion SP as stated in Table 7.3-1 is not fulfilled, taking into consideration the average condition of the single construction part based on average value of these measurements, the single construction part concerned shall be repaired or renewed.

### 7.3.5
The acceptance criterion ZP to the transverse section including deck zone, neutral axis zone and bottom zone, taking into consideration all longitudinal construction elements contributing to the vessel’s strength, is based on the general rule that the hull midship section modulus shall not be less than 90% of the original section modulus within 0.5\*L amidships.
Upon Owner’s request, the Register may perform a direct calculation on the basis of current thicknesses in order to accept greater diminutions than given for this criterion.

For vessel built with greater hull midship section modulus than required by this Rules, permissible diminution may be considered by the Register.

### 7.3.4 Acceptance criteria for thickness diminution based on net scantling approach

#### 7.3.4.1 Acceptance criteria for thickness diminution based on net scantling approach

The scantling requirements imply the following total corrosion additions $t_c$ of a structural member:

1. For net thickness of plating $t > 8.0$ mm:
   \[ t_c = t_{c1} + t_{c2}, \quad [\text{mm}] \]  \hspace{1cm} (7.3.4-1)

2. For net thickness of plating $t \leq 8.0$ mm:
   \[ t_c = \min\left(\left(t_{c1} + t_{c2}\right); 0.25 \cdot t\right), \quad [\text{mm}] \]  \hspace{1cm} (7.3.4-2)

For structural members made of stainless steel or aluminium alloys, the corrosion addition shall be taken equal to 0.25 mm, for one side exposure ($t_{c1} = t_{c2} = 0.25$ mm) except when considering superstructures and accommodation in which case the corrosion addition equals 0.0 mm.

#### Table 7.3-2

<table>
<thead>
<tr>
<th>Compartment type</th>
<th>Corrosion additions $^{1)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballast tank</td>
<td>1.00</td>
</tr>
<tr>
<td>Cargo and fuel oil tanks</td>
<td></td>
</tr>
<tr>
<td>Plating of horizontal surfaces, ordinary stiffeners and primary supporting members</td>
<td>0.75</td>
</tr>
<tr>
<td>Plating of non-horizontal surfaces</td>
<td></td>
</tr>
<tr>
<td>Horizontal members in cargo oil and fuel oil tanks.</td>
<td>0.50</td>
</tr>
<tr>
<td>Dry bulk cargo hold</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>1.00</td>
</tr>
<tr>
<td>Inner bottom plating</td>
<td></td>
</tr>
<tr>
<td>Side plating for single hull vessel</td>
<td>1.75</td>
</tr>
<tr>
<td>Inner side plating for double hull vessel</td>
<td></td>
</tr>
<tr>
<td>Transverse bulkhead plating</td>
<td></td>
</tr>
<tr>
<td>Supporting members</td>
<td>0.50</td>
</tr>
<tr>
<td>Hopper well of dredging vessels</td>
<td>2.50</td>
</tr>
<tr>
<td>Accommodation space</td>
<td>0.00</td>
</tr>
<tr>
<td>Compartments and areas other than those mentioned above</td>
<td>0.50</td>
</tr>
</tbody>
</table>

#### Notes:

1) Corrosion additions are applicable to all members of the considered item.

#### 7.3.4.2 Acceptance criteria for LP

The thickness diminution of localized parts (LP) of single construction part shall not be greater than $1.25 \cdot t_c$.

If the values measured are beyond permissible diminution, localized part of a single construction member such as single plate or supporting member shall be repaired or renewed.

#### 7.3.4.3 Acceptance criteria for SP

The thickness diminution of each single construction part shall not be greater than the value of corrosion addition as defined in 7.3.4.1.

If the average thickness diminution determined on the base of measurements taken at several positions for a single construction part is greater than the value of corrosion addition $t_c$ as defined above, single construction part shall be repaired or renewed.

#### 7.3.4.4 Acceptance criteria for ZP

The diminution of sectional area of an each of a transverse section zones (deck zone, neutral axis zone and bottom zone) shall not be greater than 10% of the original section area.

If above acceptance criteria of diminution for an each of transverse section zones are not fulfilled, then some structural members shall be replaced as found necessary by the attending Surveyor in order to obtain a satisfactorily increased sectional area.

The acceptance criterion to the transverse section including deck zone, neutral axis zone and bottom zone is based on the general rule that the hull midship section modulus shall not be less than 90% of the original section modulus within 0.5-4 amidships. Upon Owner’s request, the Register may perform a direct calculation on the basis of current thicknesses in order to accept greater diminutions than those given for this criterion.

For vessel built with greater hull midship section modulus then required by the Rules, permissible diminution may be considered by the Register.

#### 7.3.5 Acceptance criteria for pitting

#### 7.3.5.1 Pitting corrosion

Pitting corrosion is defined as scattered corrosion spots/areas with local material reductions which are greater than the general corrosion in the surrounding area. Pitting corrosion is one of most common damaging forms which can be found in ballast tanks.

Pitting corrosion is often found in the bottom plating or in horizontal surfaces, such as face plates, in ballast tanks and is normally initiated due to local breakdown of coating.

#### 7.3.5.2 The maximum acceptable depth for localized pits is 35% of the as-built thickness.

#### 7.3.5.3 Pitting intensity as defined in Figure 7.3.5-2 shall be used for areas with different pitting intensity in order to determine the percentage of affected areas. For intermediate values between localized pits and the largest affected area, Table 7.3.5-1 or diagram of Figure 7.3.5-1 shall be used.

If the average thickness diminution for area affected by pitting is greater than values given in Table 7.3.5-1, affected area or a part shall be repaired or renewed.
Table 7.3.5-1
Pitting intensity and maximum average of pitting depth

<table>
<thead>
<tr>
<th>Pitting intensity, [%]</th>
<th>Maximum average of pitting depth (% of the as-built thickness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localized</td>
<td>35,0</td>
</tr>
<tr>
<td>5</td>
<td>33,5</td>
</tr>
<tr>
<td>10</td>
<td>32,0</td>
</tr>
<tr>
<td>15</td>
<td>30,5</td>
</tr>
<tr>
<td>20</td>
<td>29,0</td>
</tr>
<tr>
<td>25</td>
<td>27,5</td>
</tr>
<tr>
<td>30</td>
<td>26,0</td>
</tr>
<tr>
<td>40</td>
<td>23,0</td>
</tr>
<tr>
<td>50</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 7.3.5-1
Pitting intensity and maximum average of pitting depth – diagram

7.4 Structure other than steel

7.4.1 For structure built with a material other than steel, alternative thickness measurement requirements may be developed and applied as deemed necessary (see 7.4.2 and 7.4.3 for aluminium or 4.9.2.5 for wooden vessels).

7.4.2 For aluminium alloy vessels the survey shall be supplemented with thickness measurements of structural elements, shell plating and stiffeners, where substantial damages or defects due to corrosion or galvanic current is found.

Thickness measurements shall be carried out on following positions:
1. suspect areas throughout the vessel;
2. stern shell plating and shell plating in way of engine rooms.

7.4.3 Structural elements, plating and stiffeners where the survey revealed damage, wastage or thickness diminution over permissible limits, shall be renewed to the original thickness at the Surveyors satisfaction.

On positions where high structural strain is possible, detailed survey shall be carried out, and if deemed necessary supplemented with a non-destructive examination.

Where the survey reveals structural defects, repairs shall be carried out promptly and thoroughly.
8 NON-PERIODICAL SURVEYS

8.1 Occasional Surveys

8.1.1 In addition to above periodical surveys, vessels may be submitted to non-periodical surveys such as occasional surveys if the circumstances require so.

Occasional survey shall be carried out in the following cases:

1. if the vessel sustains accident, calamity, damage or suspected damage of such extent that it is presumed that the ability for navigation of the vessel is endangered;
2. when alterations or conversions, repairs or renewals of the hull, machinery installations and equipment are performed;
3. updating of classification documents, e.g. when periodical surveys are delayed or postponed as prescribed by the Rules, postponement of condition of class or recommendation, change of Owner, flag, port of registry, name of the vessel;
4. on recommissioning survey after the vessel has been laid-up;
5. when temporary changing navigation area or purpose of the vessel;
6. when rectification of imposed Conditions of class shall be verified;
7. upon Owner’s request survey for towage or voyage over sea a certificate of towage or voyage over sea may be issued upon satisfactory survey the scope of which is fixed on a case by case basis by the Register according to the towing or voyage over sea.

8.1.2 The Register reserves the right to perform occasional surveys of the hull, hull equipment, machinery and electrical installations as well as special equipment and installations on existing vessels in the event that Register believes that the Rules are not being complied with.

8.2 Damage and repair surveys

8.2.1 Damage and repair surveys fall due whenever the vessel's hull and machinery, including electrical installations and other equipment covered by the classification, have suffered a damage which might affect validity of class, or if damage may be assumed to have occurred as a consequence of an average or some other unusual event (see the present Rules, Chapter I, 2.12.3.1).

8.2.2 In case of damage of the vessel’s hull, machinery including electrical installations or special equipment and installations, of other parts or equipment, the damaged parts shall be made accessible for inspection in such a way that kind and scope of the damage can be thoroughly examined and ascertained.

In the case of grounding, Dry docking Survey or In-Water Survey shall be carried out.

8.2.3 In the case of repairs and/or replacement of parts subject to classification, as a matter of principle, the Rules in force during their period of construction continue to be applicable.

However, experience and technical knowledge gathered since the vessel was built shall be taken into account with a view to avoiding recurrence of similar damages.

8.2.4 Materials and equipment used for repairs shall, in general, comply with the requirements for newbuilding (see the present Rules, Chapter I, 2.12.5 and Chapter II, Section 3).

Regarding corrosion damages or excessive wastage beyond permissible limits that affect the vessel's class (see Section 7).

8.2.5 During repair work, the Surveyor shall be informed about any damage, defects or noncompliance with the Rules and the repair measures shall be agreed with the appointed Surveyor such as to render possible confirmation of the class without reservations upon completion of the repairs.

In general, a class confirmation with conditions of class, e.g. in the case of an emergency repair, requires to be approved by the Register’s Head Office or Surveyor depending on the extent of the damage.

8.2.6 Surveys carried out in the course of repairs shall be based on the latest experience and instructions by the Register.

8.3 Voyage repairs and maintenance surveys

8.3.1 Where repairs to hull, machinery installation or equipment, which affect or may affect class, shall be carried out by a riding crew during a voyage, they shall be planned in advance.

A complete repair procedure including the extent of proposed repair and the need for the Surveyor’s attendance during the voyage shall be submitted to and agreed upon by the Register reasonably in advance.

Failure to notify the Register, in advance of the repairs, may result in suspension of the vessel’s class (see the present Rules, Chapter II, 2.1).

8.3.2 Where in any emergency circumstance, emergency repairs shall be affected immediately. The repairs should be documented in the vessel’s log and submitted thereafter to the Register for use in determining further survey requirements.

The above is not intended to include maintenance and overhaul to hull, machinery installation and equipment in accordance with manufacturer’s recommended procedures and established practice and which does not require the Register’s approval.

However any repair as a result of such maintenance and overhauls which affects or may affect classification shall be noted in the vessel’s log and submitted to the attending Surveyor for use in determining further survey requirements.

8.4 Modification or conversion survey

8.4.1 In case of modification, conversion and/or major changes of the vessel's hull, machinery, as well as special equipment and installations with effect to the class designation including class Notations, the Register’s approval of documentation and works shall be requested as in the case of newbuilding and surveys shall be carried out, as described in the present Rules, Chapter I, 2.12.5.
New Character of classification or new class Notation shall be assigned, if necessary.

8.4.2 Modifications, conversions and/or major changes shall be performed under the Surveyor’s supervision, and shall be in accordance with the requirements of the referent Rules requirements and/or additional requirements of the Register. If necessary, documentation shall be submitted to the Register and shall be available to the Surveyor.