



# Rules for the Classification of Naval Ships

*Effective from 1 January 2017*

## Part A Classification and Surveys

Emirates Classification Society (Tasneef)  
Aldar HQ 19th Floor,  
Al Raha Beach, Abu Dhabi, UAE  
Abu Dhabi, United Arab Emirates

Phone (+971) 2 692 2333  
Fax (+971) 2 445 433  
P.O. Box. 111155  
[info@tasneef.ae](mailto:info@tasneef.ae)

# GENERAL CONDITIONS

## Definitions:

“Administration” means the Government of the State whose flag the Ship is entitled to fly or under whose authority the Ship is authorised to operate in the specific case.

“IACS” means the International Association of Classification Societies.

“Interested Party” means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

“Owner” means the registered owner, the ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

“Rules” in these General Conditions means the documents below issued by the Society:

- (i) Rules for the Classification of Ships or other special units;
- (ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
- (iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations;
- (iv) Guides to carry out particular activities connected with Services;
- (v) Any other technical document, as for example rule variations or interpretations.

“Services” means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

“Ship” means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.

“Society” or “TASNEEF” means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

“Surveyor” means technical staff acting on behalf of the Society in performing the Services.

## Article 1

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:

- (i) sets forth and develops Rules;
- (ii) publishes the Register of Ships;
- (iii) issues certificates, statements and reports based on its survey activities.

1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.

1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which are regulated by these general conditions, unless expressly excluded in the particular contract.

## Article 2

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, although committed also through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2. The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification.

The Rules for Classification of Ships are published on the Society's website: [www.tasneef.ae](http://www.tasneef.ae).

2.3. The Society exercises due care and skill:

- (i) in the selection of its Surveyors
- (ii) in the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.

2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or of the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

## Article 3

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).

The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.

3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.3. The classification of a Ship, or the issuance of a certificate or other document connected with classification or certification and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness,

structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

3.4. Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.

3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered.

Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

#### **Article 4**

4.1. Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

4.2. In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

4.3. The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination.

With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any statutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

#### **Article 5**

5.1. In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see art. 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

5.2. Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

5.3. Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

#### **Article 6**

6.1. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

6.2. However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

#### **Article 7**

**7.1.** All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorisation of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.

Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.

**7.2.** Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.

**7.3.** In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.

In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

#### **Article 8**

**8.1.** Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

# EXPLANATORY NOTE TO PART A

## 1. Reference edition

The reference edition for Part A is this edition effective from 1<sup>st</sup> January 2015.

## 2. Effective date of the requirements

2.1 All requirements in which new or amended provisions with respect to those contained in the reference edition have been introduced are followed by a date shown in brackets.

The date shown in brackets is the effective date of entry into force of the requirements as amended by last updating. The effective date of all those requirements not followed by any date shown in brackets is that of the reference edition.

2.2 Item 5 below provides a summary of the technical changes from the preceding edition.

## 3. Rule Variations and Corrigenda

Until the next edition of the Rules is published, Rule Variations and/or corrigenda, as necessary, will be published on the Tasneef web site ([www.tasneef.ae](http://www.tasneef.ae)). Except in particular cases, paper copies of Rule Variations or corrigenda are not issued.

## 4. Rule subdivision and cross-references

### 4.1 Rule subdivision

The Rules are subdivided into five parts, from A to E.

Part A: Classification and Surveys

Part B: Hull and Stability

Part C: Machinery, Systems and Fire Protection

Part D: Service Notations

Part E: Additional Class Notations

Each Part consists of:

- Chapters
- Sections and possible Appendices
- Articles
- Sub-articles
- Requirements

Figures (abbr. Fig) and Tables (abbr. Tab) are numbered in ascending order within each Section or Appendix.

### 4.2 Cross-references

Examples: Pt A, Ch 1, Sec 1, [3.2.1] or Pt A, Ch 1, App 1, [3.2.1]

- Pt A means Part A

The part is indicated when it is different from the part in which the cross-reference appears. Otherwise, it is not

indicated.

- Ch 1 means Chapter 1

The Chapter is indicated when it is different from the chapter in which the cross-reference appears. Otherwise, it is not indicated.

- Sec 1 means Section 1 (or App 1 means Appendix 1)

The Section (or Appendix) is indicated when it is different from the Section (or Appendix) in which the cross-reference appears. Otherwise, it is not indicated.

- [3.2.1] refers to requirement 1, within sub-article 2 of article 3.

Cross-references to an entire Part or Chapter are not abbreviated as indicated in the following examples:

- Part A for a cross-reference to Part A
- Part A, Chapter 1 for a cross-reference to Chapter 1 of Part A.

## 5. Summary of amendments introduced in the edition effective from 1<sup>st</sup> January 2017

This edition of the Rules for the Classification of Naval Ships contains amendments whose effective date is 1 January 2017.

The date of entry into force of each new or amended item is shown in brackets after the number of the item concerned

This edition of the Rules for the classification of Naval Ships is considered as a reference edition for future amendments.

### Description of the amendments

The amendments involve both the framework of the Rules and the technical requirements.

Part A  
**Classification and Surveys**

Chapters **1 2 3 4 5**

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<b>Chapter 2</b>	<b>ASSIGNMENT, MAINTENANCE, SUSPENSION AND WITHDRAWAL OF CLASS</b>
<b>Chapter 3</b>	<b>SCOPE OF SURVEYS (all ships)</b>
<b>Chapter 4</b>	<b>SCOPE OF SURVEYS IN RESPECT OF THE DIFFERENT SERVICES OF SHIPS</b>
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# CHAPTER 1

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Part A  
**Classification and Surveys**

Chapter 1

**PRINCIPLES OF CLASSIFICATION AND CLASS  
NOTATIONS**

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**SECTION 1      GENERAL PRINCIPLES OF CLASSIFICATION**

**SECTION 2      CLASSIFICATION NOTATIONS**



## SECTION 1

## GENERAL PRINCIPLES OF CLASSIFICATION

### 1 Principles of classification

#### 1.1 Purpose of the Rules

**1.1.1** The Rules published by the Society give the requirements for the assignment and the maintenance of class for seagoing surface naval ships where the term naval ships includes warships, troopships and naval auxiliary ships.

Class assigned to a ship reflects the discretionary opinion of the Society that the ship, for declared conditions of use and within the relevant time frame, complies with the Rules applicable at the time the service is rendered.

Note 1: The general conditions of classification are laid down in the Preamble.

#### 1.1.2

The application criteria of the different parts of the present Rules are the following:

- Part A - Classification and Surveys applies to all ships.
- Part B - Hull and Stability, Part C - Machinery and Systems, Part D - Service Notations apply to seagoing ships whose hull is of welded steel construction or, for ships assigned with service notation mine-countermeasure vessel, in composite material. Where necessary, the extent of application is more precisely defined in each chapter of these parts of the Rules.
- Part E - Additional Class Notations applies, at the request of the Interested Party, to all ships.

The requirements for Materials and Welding are provided in Part D of the Rules for the Classification of Ships (Rules for "merchant ships").

The classification of ships other than those dealt with in the above-mentioned Parts B, C and D is covered by specific Rules published by the Society.

#### 1.2 General definitions

##### 1.2.1 (1/1/2017)

The following general definitions are used in these Rules:

- Society means Tasneef and/or all other Companies in the Tasneef Group which provide the Services
- Rules means these Rules for the Classification of Naval Ships and documents issued by the Society serving the same purpose
- Surveyor means technical staff acting on behalf of the Society to perform tasks in relation to classification and survey duties
- Survey means an intervention by the Surveyor for assignment or maintenance of class as defined in

Chapter 2, or interventions by the Surveyor within the limits of the tasks delegated by the Naval Authorities

- Interested Party means a party, other than the Society, having responsibility for the classification of the ship, such as the Owner of the ship and his representatives, or the Shipbuilder, or the Engine Builder, or the Supplier of parts to be tested
- QSCS Classification Society means a Classification Society which is subject to verification of compliance with the IACS Quality System Certification Scheme (QSCS)
- Navy means the Governmental Body to whom the State or the Defence Department of the State has delegated responsibility for ownership of naval ships. The Navy is responsible for the requirement, procurement and through life support of the naval ship
- Naval Authority means the authority nominated by the Navy responsible for providing regulation associated with procurement and support of the ship. The Naval Authority may also be responsible for identifying appropriate standards, auditing and certification. The Naval Authority could be a Navy department, Statutory Authority or an independent organisation with appropriate standing
- Owner means the party having the responsibility to keep the ship seaworthy, having particular regard to the provisions relating to the maintenance of class laid down in Chapter 2
- Approval means the examination and acceptance by the Society of documents, procedures or other items related to classification, verifying solely their compliance with the relevant Rules requirements, or other referentials where requested
- Type approval means an approval process for verifying compliance with the Rules of a product, a group of products or a system, and considered by the Society as representative of continuous production
- Essential service is intended to mean a service necessary for a ship to proceed at sea, be steered or manoeuvred, or undertake activities connected with its operation, and for the safety of life, as far as class is concerned.

#### 1.3 Meaning of classification, scope and limits

##### 1.3.1 The classification consists of:

- the development of Rules, guidance notes and other documents relevant to the ship, structure, material,

equipment, machinery and any other item covered by such documents

- the examination of plans and calculations and the surveys, checks and tests intended to ensure that the ship meets the Rules (refer to Ch 2, Sec 1)
- the assignment of class (see Ch 2, Sec 1) and issue of a Certificate of Classification, where the above Rules are met
- the periodical, occasional and class renewal surveys performed to verify that the ship in service meets the conditions for maintenance of class (see Ch 2, Sec 2).

**1.3.2** The Rules, surveys performed, reports, certificates and other documents issued by the Society, are in no way intended to replace or alleviate the duties and responsibilities of other parties such as Navy, Naval Authority, Designers, Shipbuilders, Manufacturers, Repairers, Suppliers, Contractors or Sub-contractors, actual or prospective Owners or Operators, Charterers, Brokers, Cargo-owners and Underwriters. The Society cannot therefore assume the obligations arising from these functions, even when the Society is consulted to answer inquiries concerning matters not covered by its Rules, or other documents.

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

The classification-related services and documents performed and issued by the Society do not relieve the parties concerned of their responsibilities or other contractual obligations expressed or implied or of any liability whatsoever, nor do they create any right or claim in relation to the Society with regard to such responsibilities, obligations and liabilities. In particular, the Society does not declare the acceptance or commissioning of a ship or any part of it, this being the exclusive responsibility of the Owner.

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

During periods of construction, modification or repair, the unit is solely under the responsibility of the builder or the repair yard. As an example, the builder or repair yard is to ensure that the construction, modification or repair activities are compatible with the design strength of the ship and that no permanent deformations are sustained.

Note 1: Refer to [3.3] as regards the Owner's responsibility for maintenance and operation of the ship in relation to the maintenance of class.

## 1.4 Request for services

**1.4.1** Requests for interventions by the Society, such as surveys during construction, surveys of ships in service, tests, etc., are in principle to be submitted in writing and signed by the Interested Party. Such request implies that the applicant will abide by all the relevant requirements of the Rules, including its Preamble.

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

## 2 Rules

### 2.1 Effective date

**2.1.1** The effective date of entry into force of any amendments to the Rules is indicated on the inside front page of each Part of the Rules.

#### 2.1.2

In principle, the applicable Rules for assignment of class to a new ship are those in force at the date when the contract between the Owner and the shipyard is signed (see Note 1).

Note 1:

- a) The date of "contract for construction" of a ship is the date on which the contract to build the ship is signed between the prospective Owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the ships included are to be declared to the Society by the party applying for the assignment of class to a new building.
- b) The date of "contract for construction" of a series of ships, including specified optional ships for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective Owner and the shipbuilder. For the purpose of this issue, ships built under a single contract for construction are considered a "series of ships" if they are built to the same approved plans for classification purposes. However, ships within a series may have design alterations from the original design provided:
  - such alterations do not affect matters related to classification, or
  - if the alterations are subject to classification requirements, either these alterations comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective Owner and the shipbuilder or, in the absence of the alteration contract, they comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

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

- c) If a contract for construction is later amended to include additional ships or additional options, the date of "contract for construction" for such ships is the date on which the amendment to the contract is signed between the prospective Owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which a) and b) above apply.
- d) If a contract for construction is amended to change the ship category, the date of "contract for construction" of this modified ship, or ships, is the date on which the revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

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

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

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

**2.1.5** The rule requirements related to assignment, maintenance and withdrawal of the class of ships already in operation, as detailed in Chapter 2 to Chapter 5, are applicable from the date of their entry into force.

## 2.2 Equivalence

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

## 2.3 Novel features

**2.3.1** The Society may consider the classification of ships based on or applying novel design principles or features, to which the Rules are not directly applicable, on the basis of experiments, calculations or other supporting information provided to the Society. The specific limitations may then be indicated on the Certificate of Classification.

## 2.4 Interpretation

**2.4.1** The Society alone is qualified to decide upon the meaning, interpretation and application of the Rules and other classification-related documents. No reference to the Rules or other classification-related documents has any value unless it involves, accompanies or follows the intervention of the Society.

## 2.5 Disagreement and appeal

**2.5.1** Any technical disagreement with the Surveyor in connection with the performance of his duties should be raised by the Interested Party as soon as possible.

The Interested Party may appeal in writing to the Society, which will subsequently consider the matter and announce its decision according to its established procedure.

# 3 Duties of the Interested Parties

## 3.1 International and national regulations

**3.1.1** The classification of a ship does not absolve the Interested Party from compliance with any requirements

issued by the Naval Authority and any other applicable international and national regulations for the safety of life at sea and protection of the marine environment.

**3.1.2** When authorised by the Naval Authority concerned, the Society will act on its behalf within the limits of such authorisation. In this respect, the Society will take into account the relevant requirements, survey the ship, report and issue or contribute to the issue of the corresponding certificates.

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

**3.1.3** In the case of a discrepancy between the provisions of the applicable international and national regulations and those of the Rules, normally, the former take precedence. However, the Society reserves the right to call for the necessary adaptation to preserve the intention of the Rules or to apply the provisions of [1.4.1].

## 3.2 Surveyor's intervention

**3.2.1** Except for secrecy or operational restrictions, Surveyors are to be given free access at all times to ships which are classed or being classed, shipyards and works, to carry out their interventions within the scope of assignment or maintenance of class, or within the scope of interventions carried out on behalf of the Naval Authority, when so delegated.

### 3.2.2 (1/7/2016)

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

Refer also to Ch 2, Sec 2, [2.5] to Ch 2, Sec 2, [2.9].

For the safe entry into confined spaces, the requirements of IACS Procedural Requirement No. 37 "Procedural Requirement for Confined Space Safe Entry" apply.

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

**3.2.4** During the phases of ship design and construction, due consideration should be given to rule requirements in respect of all necessary arrangements for access to spaces and structures with a view to carrying out class surveys. Arrangements of a special nature are to be brought to the attention of the Society.



### 3.3 Operation and maintenance of ships

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

In particular, it will be assumed that the draught of the ship in operating conditions will not exceed the maximum approved for the classification, that the ship 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 ship are adapted to the prevailing sea and weather conditions, and that the ship is operated in accordance with the applicable international and national regulations for the prevention and containment of marine pollution.

**3.3.2** Any document issued by the Society in relation to its interventions reflects the condition of the ship as found at the time and within the scope of the survey. It is the Interested Party's responsibility to ensure proper maintenance of the ship until the next survey required by the Rules. It is the duty of the Interested Party to inform the Surveyor when he boards the ship of any events or circumstances affecting the class.

### 3.4 Use of measuring equipment and of service suppliers

#### 3.4.1 General

Firms providing services on behalf of the Interested Party, such as measurements, tests and servicing of safety systems and equipment, the results of which may form the basis for the Surveyor's decisions, are subject to the acceptance of the Society, as deemed necessary.

The equipment used during tests and inspections in workshops, shipyards and on board ships, the results of which may form the basis for the Surveyor's decisions, is to be customary for the checks to be performed. Firms are to individ-

ually identify and calibrate to a recognised national or international standard each piece of such equipment.

#### 3.4.2 Simple measuring equipment

The Surveyor may accept simple measuring equipment (e.g. rulers, tape measures, weld gauges, micrometers) without individual identification or confirmation of calibration, provided it is of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces.

#### 3.4.3 Shipboard measuring equipment

The Surveyor may accept measuring equipment fitted on board a ship (e.g. pressure, temperature or rpm gauges and meters) and used in examination of shipboard machinery and/or equipment based either on calibration records or comparison of readings with multiple instruments.

#### 3.4.4 Other equipment

The Surveyor may request evidence that other equipment (e.g. tensile test machines, ultrasonic thickness measurement equipment, etc) is calibrated to a recognised national or international standard.

### 3.5 Spare parts

**3.5.1** It is the Owner's responsibility to decide whether and which spare parts are to be carried on board.

**3.5.2** As spare parts are outside the scope of classification, the Surveyor will not check that they are kept on board, maintained in a satisfactory condition, or suitably protected and lashed.

However, in the case of repairs or replacement, the spare parts used are to meet the requirements of the Rules as far as practicable; refer to Ch 2, Sec 2, [11.3.2].

### 3.6 Use of asbestos

#### 3.6.1 (1/1/2017)

New installation of materials which contain asbestos is prohibited.

## SECTION 2

## CLASSIFICATION NOTATIONS

### 1 General

#### 1.1 Purpose of the classification notations

**1.1.1** The classification notations give the scope according to which the class of the ship has been based and refer to the specific rule requirements which are to be complied with for their assignment. In particular, the classification notations are assigned according to the type, service and navigation of the ship and other criteria which have been provided by the Interested Party, when applying for classification.

The Society may change the classification notations at any time, when the information available shows that the requested or already assigned notations are not suitable for the intended service, navigation and any other criteria taken into account for classification.

Note 1: Reference should be made to Sec 1, [1.3] on the limits of classification and its meaning.

**1.1.2** The classification notations assigned to a ship are indicated on the Certificate of Classification.

##### 1.1.3

The classification notations applicable to existing ships conform to the Rules of the Society in force at the date of assignment of class, as indicated in Ch 2, Sec 1. However, the classification notations of existing ships may be updated according to the current Rules, as far as applicable.

#### 1.2 Types of notations assigned

##### 1.2.1

The types of classification notations assigned to a ship are the following:

- a) main class symbol
- b) construction marks
- c) ship category, service notations with additional service features, as applicable
- d) navigation notations
- e) additional class notations (optional)

The different classification notations and their conditions of assignment are listed in [2] to [7] below, according to their types.

##### 1.2.2

As an example, the classification notations assigned to a ship may be as follows (the kind of notation shown in brackets does not form part of the classification notation indicated the Certificate of Classification:

**NC** ⌘ **HULL** ● **MACH**

(main class symbol, construction marks)

**auxiliary ship; supply ship - flash point >60°C**

(ship category, service notation and additional service feature)

**unrestricted navigation**

(navigation notation)

⌘ **MILITARY**

(additional class notation).

### 2 Main class symbol

#### 2.1

**2.1.1** The main class symbol expresses the degree of compliance of the ship with the rule requirements as regards its construction and maintenance. There is one main class symbol, which is compulsory for every classed ship.

##### 2.1.2

The main class symbol **NC**, where the letters **NC** mean Naval Class, is assigned to ships built in accordance with the requirements of the Rules or other rules recognised as equivalent, and maintained in a condition considered satisfactory by the Society. The period of class (or interval between class renewal surveys) assigned to a ship is maximum 5 years; see Ch 2, Sec 2, [4].

Except for special cases, class is assigned to a ship only when the hull, propulsion and auxiliary machinery installations, and equipment providing essential services have all been reviewed in relation to the requirements of the Rules.

The main class symbol may be completed by the notation **experimental**, assigned provisionally to ships or other units whose design and building criteria are considered novel or unusual, either wholly or in part, though judged satisfactory by the Society on the basis of design plans, laboratory tests and tests in working conditions after construction. The notation **experimental** implies subsequent confirmation or modification of the judgement by the Society after a suitable period of service of the ship, to be stipulated in each case.

The main class symbol may be completed by the notation **special**, assigned to ships and other units built according to standards other than those in the Rules but which are considered satisfactory by the Society.

### 3 Construction marks

#### 3.1 General

**3.1.1** The construction mark identifies the procedure under which the ship and its main equipment or arrangements have been surveyed for initial assignment of the class. The procedures under which the ship is assigned one of the construction marks are detailed in Ch 2, Sec 1.

**3.1.2** One of the construction marks defined below is assigned separately to the hull of the ship and its appendages, to the machinery installation, and to some installations for which an additional classification notation (see [7] below) is assigned.

The construction mark is placed before the symbol **HULL** for the hull, before the symbol **MACH** for the machinery installations, and before the additional class notation granted, when such a notation is eligible for a construction mark.

When the same construction mark is assigned to both hull and machinery, the construction mark is assigned globally to the ship without indication **HULL** and **MACH** after the main class symbol.

If the ship has no machinery installations covered by classification, the symbol **MACH** is not granted and the construction mark will be placed before the symbol **HULL**.

**3.1.3** The construction marks refer to the original condition of the ship. However, the Society may change the construction mark where the ship is subjected to repairs, conversion or alterations.

## 3.2 List of construction marks

**3.2.1** The mark ☒ is assigned to the relevant part of the ship, when it has been surveyed by the Society during its construction in compliance with the new building procedure detailed in Ch 2, Sec 1, [2.1].

**3.2.2** The mark ● is assigned to the relevant part of the ship, where the procedure for the assignment of classification is other than those detailed in [3.2.1], but however deemed acceptable.

## 4 Ship category and Service notations

### 4.1 General

#### 4.1.1

The ship's category defines the main tasks and operational capability of the ship in relation to his military role; ship categories are listed in [4.2] below.

The service notations define the service of the ship which have been considered for its classification; service notations are listed in [4.3] below.

Ship's category and service notations are to be indicated in the request for classification signed by the Interested Party.

Ship's category and at least one service notation is to be assigned to every classed ship.

Note 1: The service notations applicable to existing ships conform to the Rules of the Society in force at the date of assignment of class. However, the service notations of existing ships may be updated according to the current Rules, as far as applicable, at the request of the Interested Party.

#### 4.1.2

The assignment of any ship category and service notation to a new ship is subject to compliance with general rule requirements laid down in Part B and Part C of the Rules, in Part D of the Rules for the Classification of Ships and, for

some service notations, the additional requirements laid down in Part D of these Rules.

**4.1.3** A ship may be assigned several different service notations. In such case, the specific rule requirements applicable to each service notation are to be complied with. However, if there is any conflict in the application of the requirements applicable to different service notations, the Society reserves the right to apply the most appropriate requirements or to refuse the assignment of one of the requested service notations.

**4.1.4** A service notation may be completed by one or more additional service features, giving further precision regarding the type of service of the ship, for which specific rule requirements are applied.

## 4.2 Ship categories

### 4.2.1

For the purpose of classification the following **ship categories** are defined:

- **Front line ship**, means a ship designed for world wide operations and used either as centres of command or as a part of a task force or as an independent unit. They may have a variety of roles as air defence, anti submarine, sea defence or shore support. They typically have displacement of more than 2000 tonnes and comply with very severe requirements.
- **Second line ship**, means a ship designed for operations in restricted service area and used for the same roles of Front line ship. They typically have displacement of less than 2000 tonnes and comply with less severe requirements in respect of Front line ships.
- **Auxiliary ship**, means a ship designed for operations in unrestricted or restricted service area and used to support other vessels or a task force. They may have a variety of sole or multiple roles including amphibious warfare, mine sweeping or supply.

## 4.3 Service notations

### 4.3.1

The service notations that may be assigned to ships are listed below and grouped per the ship category:

- Front line ships:
  - **aircraft carrier**: ship with capability to launch recover and accommodate both aircrafts and helicopters;
  - **helicopter carrier**: ship with capability to launch recover and accommodate helicopters;
  - **destroyer**: large warship for air, surface and/or anti-submarine warfare;
  - **frigate**: warship smaller than a destroyer for air, surface and/or anti-submarine warfare;
- Second line ships:
  - **corvette**: small warship for air, surface and/or anti-submarine warfare;
  - **patrol ship**: small naval ship for patrolling operation and coastal defence tasks;
- Auxiliary ships:

- **supply ship:** ships with capability to provide under-way replenishment and/or logistic support to other fleet units;
- **amphibious warfare ship:** ship with capability for amphibious assault by means of well deck and/or helicopter deck;
- **mine countermeasure vessel:** ship with specific features for the location of and destruction of naval mines.

The subdivision per ship categories is to be considered as indicative; the above listed service notations may be assigned even to ship categories different than the one suggested above.

#### 4.3.2

The service notation **special service** is assigned to ships which, due to the peculiar characteristics of their activity, are not covered by any of the notations mentioned above. The classification requirements of such units are considered by the Society on a case by case basis. An additional **service feature** may be specified after the notation (e.g. **special service - training, special service - ship lift**) to identify the particular service in which the ship is intended to trade. The scope and criteria of classification of such units are indicated in an annex to the Certificate of Classification.

#### 4.3.3

The additional requirements for the assignment of the service notations **aircraft carrier** and **helicopter carrier** are given in Part D, Chapter 2.

The additional requirements for the assignment of the service notations **supply ship** are given in Part D, Chapter 1.

The additional requirements for the assignment of the service notations **amphibious warfare ship** are given in Part D, Chapter 3.

The additional requirements for the assignment of the service notations **mine countermeasure vessel** are given in Part D, Chapter 4.

## 5 Navigation notations

### 5.1

**5.1.1** Every classed ship is to be assigned one navigation notation as listed in [5.2].

**5.1.2** The assignment of a navigation notation, including the reduction of scantlings or specific arrangements for restricted navigation notations, is subject to compliance with the requirements laid down in Part B, Part C, Part D and Part E of the Rules.

**5.1.3** The assignment of a navigation notation does not absolve the Interested Party from compliance with any international and national regulations established by the Administrations for a ship operating in national waters, or a specific area, or a navigation zone. Neither does it waive the requirements in Sec 1, [3.3.1].

## 5.2 List of navigation notations

**5.2.1** The navigation notation **unrestricted navigation** is assigned to a ship intended to operate in any area and any period of the year.

#### 5.2.2 (1/1/2017)

The navigation notation **unrestricted navigation (summer zone)** is assigned to ships intended to operate within the geographical limits defined in ILLC 1966 for the Summer zones without limitations of distance from the shore.

#### 5.2.3 (1/1/2017)

The navigation notation **unrestricted navigation (tropical zone)** is assigned to ships intended to operate only within the geographical limits as defined in ILLC 1966 for the Tropical zones without limitations of distance from the shore..

#### 5.2.4

The navigation notation **offshore navigation** is assigned to ships intended to operate only within 200 nautical miles and with a maximum sailing time of twelve hours from a port of refuge or safe sheltered anchorage.

**5.2.5** The navigation notation **coastal area** is assigned to ships intended to operate only within 20 nautical miles from the shore and with a maximum sailing time of six hours from a port of refuge or safe sheltered anchorage.

**5.2.6** The navigation notation **sheltered area** is assigned to ships intended to operate in sheltered waters , i.e. harbours, estuaries, roadsteads, bays, lagoons and generally calm stretches of water and when the wind force does not exceed 6 Beaufort scale.

#### 5.2.7

The navigation notations defined in these items [5.2.1] to [5.2.7] are those considered as "normal". Where particular cases of navigation are to be assigned which are not included among those so defined, the navigation notation **special** is assigned, followed by specified restrictions (such as the designation of the geographical area, distance from the shore and/or the most unfavourable sea conditions considered).

**5.2.8** In specific cases, the designation of the geographical area and/or the most unfavourable sea conditions considered may be added to the navigation notation.

## 6 Operative profile

### 6.1 General

#### 6.1.1 (1/1/2017)

The operative profile is assigned to ships whose propulsion engines are approved by the Society for light duty or medium duty operative profiles as defined in Part C, Ch 1, Sec 2 [1.4] of the Rules.

The assignment of an operative profile for the ship together with the detailed operative parameters is to be recorded in the class certificate.

## 7 Additional class notations

### 7.1 General

**7.1.1** An additional class notation expresses the classification of additional equipment or specific arrangement, which has been requested by the Interested Party.

#### 7.1.2

The assignment of such an additional class notation is subject to the compliance with additional rule requirements, which are detailed in Part E of the Rules or in analogue Parts of other Tasneef Rules as specified in [7.2].

**7.1.3** Some additional class notations, due to the importance of relevant equipment or arrangements, are assigned a construction mark, according to the principles given in [3.1.2]. This is indicated in the definition of the relevant additional class notations.

**7.1.4** The different additional class notations which may be assigned to a ship are listed in [7.3] to [7.6], according to the category to which they belong. These additional class notations are also listed in alphabetical order in Tab 1 and Tab 2.

### 7.2 Additional Class Notations in accordance with other Tasneef Rules

#### 7.2.1

Naval ship may be assigned of additional class notations which are defined in other Tasneef Rules (e.g. Tasneef Rules for the Classification of Ships) provided that they are not in contrast with the requirements of Rules; in such a case, cross reference to other parts of the Rules, if not consistent with framework, are to be managed by the Society on a case by case basis.

### 7.3 Military (MILITARY)

#### 7.3.1 General

The additional class notation **MILITARY** is assigned to ships which design incorporates particular features relating to military loads or fitted with particular systems and/or arrangements related to the military aspects of the ship.

In compliance with [7.1.3], this notation may be assigned a construction mark, as defined in [3].

In particular, the following confidential notations are available, and will be known only to the Shipyard, the Owner and Tasneef.

#### 7.3.2 Structural damage (STRU-DAM)

The confidential additional class notation **STRU-DAM** is assigned to ships capable of meeting the global structural requirements to withstand the impact of either a surface-surface missile or a naval gun.

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 1).

#### 7.3.3 External air blast (EXT-BLAST)

The confidential additional class notation **EXT-BLAST** is assigned to ships with superstructures capable of meeting

the structural requirements to withstand an external blast (temporary overpressure caused by an explosion outside the vessel).

The above is completed by the following notations depending of the type of explosion considered:

- **-CONV**, for conventional explosion
- **-NUCL**, for nuclear explosion.

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 2).

#### 7.3.4 Internal air blast (INT-BLAST)

The confidential additional class notation **INT-BLAST** is assigned to ships with some structures, which bound the safety areas, capable of meeting the structural requirements to withstand an internal blast (temporary overpressure caused by an internal explosion of a missile warhead).

The notation is completed by a number **2**, **3** or **n** which represents the number of safety areas to this respect into which the ship is subdivided.

The requirements for the assignment of this notations are given in ( Pt E, Ch 1, Sec 3).

#### 7.3.5 Fragmentation protection (FRAGM)

The confidential additional class notation **FRAGM** is assigned to ships with some structures, which bound the safety areas, capable of meeting the structural requirements to withstand a certain class of fragments (bodies with a certain mass and speed usually generated by an explosion of a missile warhead or a gun shot).

The notation is completed by a number **2**, **3** or **n** which represents the number of safety areas to this respect into which the ship is subdivided.

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 4).

#### 7.3.6 Air explosion (AIR-EX)

The confidential additional class notation **AIR-EX** is assigned to ships whose survivability of specified performance levels are assured after an external or internal blast caused by a conventional explosion, respectively outside or inside the vessel.

The above is completed by the following notations according to the specified performance assured:

- **-FLOAT**, for buoyancy and structural integrity
- **-FUNCT**, for a performance that is to be specified by the Owner (e.g. mobility, air self defence, air defence, anti-submarine and antisurface warfare, etc).

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 5).

#### 7.3.7 Shock and whipping (SHOCK)

The confidential additional class notation **SHOCK** is assigned to ships whose survivability of specified performance levels are assured after a non contact underwater explosion and with global structural requirements to withstand the relevant dynamic vertical bending and vibration.

The above is completed by the following notations according to the specified performance assured:

- **-FLOAT**, for buoyancy and structural integrity
- **-WHIP**, for global structural resistance under bending and vibrations due to whipping

- **-FUNCT**, for a performance that is to be specified by the Owner (e.g. mobility, air self defence, air defence, anti-submarine and antisurface warfare, etc).

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 6).

### 7.3.8 Tetterist attack (TERR)

The confidential additional class notation **TERR** is assigned to ships with some structures have ballistic protection capable of protecting certain areas from gun shots from small arms.

The notation is completed by a number **2**, **3** or **n** which represents the number of protected areas.

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 7).

### 7.3.9 Sea-keeping assessment (SEA-KEEP)

The confidential additional class notation **SEA-KEEP** is assigned to ships whose specified performance levels are assured up to a certain sea state, according to the NATO standards STANAG 4154 Ed. 3.

The above is completed by the following notations according to the specified performance assured:

- **-FLY-X(L,M,H)**, for fly operations
- **-RAS-X(L,M,H)**, for replenishment at sea
- **-WEAP-X(L,M,H)**, for weapon systems operations.

where **X** indicates the state number and **L**, **M** and **H** further specifies the degree of severity (**Low**, **Medium**, **High**) of the sea state considered among those characterised by the number (e.g. **SEA-KEEP-FLY-3H** is assigned to a ship that can satisfy the flight operation limits up to a High Sea State 3).

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 8).

### 7.3.10 NBC protection (NBC-PROT)

The confidential additional class notation **NBC-PROT** is assigned to ships complying with the NATO standards relevant to the capability to operate in contaminated area.

The notation is completed by the symbols **Z=x** and **D=y** where **x** represents the total number of independent citadels and **y** the total number of decontamination rooms.

The requirements for the assignment of this notation are given in ( Pt E, Ch 1, Sec 9).

## 7.4 Automated machinery systems (AUT)

### 7.4.1 General

The notations dealt with under this heading are relevant to automated machinery systems installed on board ships.

In compliance with [7.1.3], these notations are assigned a construction mark, as defined in [3].

The requirements for the assignment of these notations are given in Part E, Chapter 2.

### 7.4.2 Integrated automation systems (AUT-IAS)

The additional class notation **AUT-IAS** is assigned to ships which are fitted with automated installations enabling machinery spaces to remain periodically unattended in all sailing conditions including manoeuvring, and additionally

provided with integrated systems enabling to handle control, safety and monitoring of machinery.

### 7.4.3 Qualified automation systems (AUT-QAS)

The additional class notation **AUT-QAS** is assigned to ships which are fitted with automated installations enabling machinery spaces to remain periodically unattended in all sailing conditions including manoeuvring.

## 7.5 Monitoring equipment (MON)

### 7.5.1 General

The notations dealt with under this heading are relevant to hull and tailshaft monitoring equipment installed on board ships.

The requirements for the assignment of these notations are given in Part E, Chapter 3.

### 7.5.2 Tailshaft monitoring system (MON-SHAFT-WATER)

The additional class notation **MON-SHAFT-WATER** is assigned to ships which are fitted with a temperature monitoring system for the tailshaft sterntube aft bearing. The assignment of this notation allows the ship to be granted a reduced scope for complete tailshaft surveys, see Ch 2, Sec 2, [8.5.1].

## 7.6 Other additional class notations

### 7.6.1 Ship manoeuvrability

The additional class notation **MANOVR-MIL** may be assigned to ships complying with high level manoeuvring capability standards.

The requirements for the assignment of this notation are given in Pt E, Ch 4, Sec 1.

### 7.6.2 Helicopter deck (1/1/2017)

The additional class notation **HELICOPTER** is mandatory for ships provided with an helicopter deck.

The requirements for the assignment of this notations are given in Pt E, Ch 4, Sec 2.

### 7.6.3 Lifting appliances

The additional class notation **LA** may be assigned to ship fit-fitted with lifting appliances meeting the requirements of the Rules.

In compliance with [7.1.3], these notations are assigned a construction mark, as defined in [3].

The requirements for the assignment of these notations are given in Pt E, Ch 4, Sec 4.

### 7.6.4 MARPOL compliance

Ships complying with the applicable requirements of the MARPOL Convention, in relation of their service, may be assigned the following additional class notations:

- MARPOL I**, for ships meeting the requirements of MARPOL 73/78 Annex I: pollution by oil
- MARPOL II**, for ships meeting the requirements of MARPOL 73/78 Annex II: pollution by noxious liquid substances in bulk

- c) **MARPOL III**, for ships meeting the requirements of MARPOL 73/78 Annex III: pollution by harmful substances carried out by sea in packaged form
- d) **MARPOL IV**, for ships meeting the requirements of MARPOL 73/78 Annex IV: pollution by sewage from ships
- e) **MARPOL V**, for ships meeting the requirements of MARPOL 73/78 Annex V: pollution by garbage from ships
- f) **MARPOL VI**, for ships meeting the requirements of MARPOL 73/78 Annex VI: prevention of air pollution from ships.

Provided the respect of the applicable requirements of the Convention, **MARPOL** additional class notations may be assigned even if the relevant statutory certificates are not issued.

### 7.6.5 LOAD LINE compliance

The additional class notation **ILL** may be assigned to ships complying with the applicable requirements of the INTERNATIONAL LOAD LINE Convention.

Provided the respect of the applicable requirements of the Convention, **ILL** additional class notation may be assigned even if the relevant statutory certificate is not issued and load line not marked on ship's side.

### 7.6.6 Italian Navy Standard

The additional class notation **MMI-STD** may be assigned to ships with enhanced technical standard which are in line with the standards adopted by the Italian Navy for its ships.

The requirements for the assignment of this notation are given in Pt E, Ch 4, Sec 5.

### 7.6.7 MOORING

The additional class notation **MOORING** may be assigned to ships provided with mooring lines and mooring winches according to Pt E, Ch 4, Sec 3.

### 7.6.8 Enhanced Damage Stability (EDMS) (1/1/2017)

The additional class notation **EDMS** is assigned to ships so designed to have an increased reserve of buoyancy and stability in way to remain afloat after a severe damage to the hull involving three or more adjacent main compartments.

The notation is completed by a number N which represents the number of main compartments considered flooded or by the wording **VULN** when, in agreement with the Naval Authority, the damage scenario is obtained from a vulnerability analysis.

The requirements for the assignment of this notation are given in Pt E, Ch 4, Sec 6.

### 7.6.9 GREEN PLUS MIL (1/1/2017)

The additional class notation **GREEN PLUS MIL** is assigned to ships designed and provided with systems, components and procedural means to control and prevent the emission of polluting substances into the sea, the air and more in general the environment, in accordance with the requirements in Pt E, Ch 4, Sec 7.

## 8 Other notations

### 8.1

#### 8.1.1

The Society may also define other notations by means of provisional requirements and guidelines, which may then be published in the form of tentative rules.

**Table 1 : List of confidential additional class notations (MILITARY)**

Additional class notation	Reference for definition	Reference in Part E	Remarks
<b>AIR-EX</b>	[7.3.6]	Pt E, Ch 1, Sec 5	(2)
<b>EXT-BLAST</b>	[7.3.3]	Pt E, Ch 1, Sec 2	(5)
<b>FRAGM</b>	[7.3.5]	Pt E, Ch 1, Sec 4	(3)
<b>INT-BLAST</b>	[7.3.4]	Pt E, Ch 1, Sec 3	(3)
<b>NBC-PROT</b>	[7.3.10]	Pt E, Ch 1, Sec 9	(4)
<b>SEA-KEEP</b>	[7.3.9]	Pt E, Ch 1, Sec 8	(1)
<b>SHOCK</b>	[7.3.7]	Pt E, Ch 1, Sec 6	(2)
<b>STRU-DAM</b>	[7.3.2]	Pt E, Ch 1, Sec 1	
<b>TERR</b>	[7.3.8]	Pt E, Ch 1, Sec 7	(3)
(1) This notation may be completed by the specific notations <b>-FLY-X(L,M,H)</b> , <b>-RAS-X(L,M,H)</b> and/or <b>-WEAP-X(L,M,H)</b> . (2) This notation may be completed by the specific notations <b>-FLOAT</b> , <b>-WHIP</b> and <b>-FUNCT</b> (3) This notation may be completed by a number <b>2</b> , <b>3</b> or <b>n</b> (4) This notation may be completed by the specific notations <b>-Z=x</b> , and <b>-D=y</b> (5) This notation may be completed by the specific notations <b>-CONV</b> , and <b>-NUCL</b>			

**Table 2 : List of additional class notations (1/1/2017)**

Additional class notation	Reference for definition	Reference in Part E	Remarks
<b>AUT-IAS</b>	[7.4.2]	Pt E, Ch 2, Sec 2	<b>(1)</b>
<b>AUT-QAS</b>	[7.4.3]	Pt E, Ch 2, Sec 1	<b>(1)</b>
<b>MON-SHAFT-WATER</b>	[7.5.2]	Pt E, Ch 3, Sec 1	
<b>HELICOPTER</b>	[7.6.2]	Pt E, Ch 4, Sec 2	
<b>ILL</b>	[7.6.5]		
<b>LA</b>	[7.6.3]	Pt E, Ch 4, Sec 4	<b>(1)</b>
<b>MANOVR-MIL</b>	[7.6.1]	Pt E, Ch 4, Sec 1	
<b>MARPOL I, II, III, IV, V, VI</b>	[7.6.4]		
<b>MMI-STD</b>	[7.6.6]	Pt E, Ch 4, Sec 5	<b>(2)</b>
<b>MOORING</b>	[7.6.7]	Pt E, Ch 4, Sec 3	
<b>EDMS</b>	[7.6.8]	Pt E, Ch 4, Sec 6	<b>(2)</b>
<b>GREEN PLUS MIL</b>	[7.6.9]	Pt E, Ch 4, Sec 7	
<p>(1) A construction mark is added to this notation.</p> <p>(2) This notation may be completed by a number <b>N</b> or the specific notation <b>VULN</b></p>			





Part A  
**Classification and Surveys**

Chapter 2

**ASSIGNMENT, MAINTENANCE, SUSPENSION AND  
WITHDRAWAL OF CLASS**

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**SECTION 1      ASSIGNMENT OF CLASS**

**SECTION 2      MAINTENANCE OF CLASS**

**APPENDIX 1    REGULATORY FRAMEWORK**

**APPENDIX 2    THICKNESS MEASUREMENTS: EXTENT, DETERMINATION OF  
LOCATIONS, ACCEPTANCE  
CRITERIA**



## SECTION 1

## ASSIGNMENT OF CLASS

### 1 General

#### 1.1

**1.1.1** Class is assigned to a ship upon a survey, with the associated operations, which is held in order to verify whether it is eligible to be classed on the basis of the Rules of the Society (see Ch 1, Sec 1, [1.3.2]). This may be achieved through:

- the completion of the new building, during which a survey has been performed,
- a specific admission to class survey for existing ships; special consideration will be given to ships transferring class from another recognised Classification Society who have appropriate Naval (Military) Ship Rules.

### 2 New building procedure

#### 2.1 Ships surveyed by the Society during construction

**2.1.1** When a ship is surveyed by the Society during construction, it is to comply with those requirements of the Rules which are in force and applicable depending on the class of the ship, taking into account the provisions of Ch 1, Sec 1, [2.1].

**2.1.2** The Society:

- approves the plans and documentation submitted as required by the Rules
- proceeds, if required, with the appraisal of the design of materials and equipment used in the construction of the ship and their inspection at works
- carries out surveys or obtains appropriate evidence to satisfy itself that the scantlings and construction meet the rule requirements in relation to the approved drawings
- attends tests and trials provided for in the Rules
- assigns the construction mark  $\boxtimes$ ; refer to Ch 1, Sec 2, [3.2.1].

**2.1.3** The Society defines in specific Rules which materials and equipment used for the construction of ships built under survey are, as a rule, subject to appraisal of their design and to inspection at works, and according to which particulars.

**2.1.4** As part of his interventions during the ship's construction, the Surveyor will:

- conduct an overall examination of the parts of the ship covered by the Rules
- examine the construction methods and procedures when required by the Rules
- check selected items covered by the rule requirements
- attend tests and trials where applicable and deemed necessary.

#### 2.1.5 Use of materials, machinery, appliances and items

As a general rule, all materials, machinery, boilers, auxiliary installations, equipment, items etc. (generally referred to as "products") which are covered by the class and used or fitted on board ships surveyed by the Society during construction are to be new and, where intended for essential services as defined in Ch 1, Sec 1, [1.2.1], tested by the Society.

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

The requirements for the selection of materials to be used in the construction of the various parts of a ship, the characteristics of products to be used for such parts and the checks required for their acceptance are to be as stated in Part C and Part D of the Rules for the Classification of Ships, as applicable, or in other Parts of the Rules or as specified on approved plans. In particular, the testing of products manufactured according to quality assurance procedures approved by the Society and the approval of such procedures are governed by the requirements of Pt D, Ch 1, Sec 1, [3] of the Rules for the Classification of the Ships.

#### 2.1.6 Defects or deficiencies and their repair

The Society 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 Society. When the limits of tolerance for defects are specified in the Rules concerned or by the Manufacturer, they are to be taken into account for repairs.

It is incumbent upon the Interested Party to notify the Society of any defects noted during the construction of the ship 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 are to be submitted to the Society and, if accepted, carried out to the Surveyor's satisfaction.

### 2.1.7 Equivalence of Rule testing under certain conditions

Notwithstanding the provisions of [2.1.4], the Society may, in liaison with the Owner, and subject to conditions and checks deemed appropriate, accept certain materials, appliances or machinery which have not been subjected to rule testing.

### 2.1.8 Equivalence of design approval by another QSCS Society under certain conditions (1/1/2017)

The Society may, in liaison with the Owner, and subject to conditions and checks deemed appropriate, accept the plans and documentation approved by another QSCS Member Society, as far as classification is concerned and according to the principle of equivalence of Rules in Ch 1, Sec 1, [2.2].

## 2.2 Other cases

**2.2.1** When the procedure adopted does not comply with that detailed in [2.1] but the Society deems that it is acceptable for the assignment of class, the construction mark ● is assigned in accordance with Ch 1, Sec 2, [3.2.2].

## 2.3 Documentation

**2.3.1** Documentation relevant to the class applied for is to be submitted for the approval of the Society.

### 2.3.2

The design data, calculations and plans to be submitted are listed in the relevant chapters of the Rules.

The Society may also call for additional information according to the specific nature of the ship to be classed.

The documentation requested in the various Chapters of the Rules in hard copy may, as an alternative, be submitted in electronic format to be agreed with the Society.

**2.3.3** The documentation submitted to the Society is examined in relation to the class applied for in the request for classification.

Note 1: Should the Interested Party subsequently wish to have the class, in particular the service notation or navigation notation, granted to the ship modified, plans and drawings are generally to be re-examined.

### 2.3.4

Together with the request for classification, the interested Party has to submit to the Society copy of the duly filled module "Regulatory Framework" provided in App 1.

When it is requested the adoption of Navy standards in lieu of some Tasneef requirements, the interested Party has to provide evidence of the approval by the Owner.

**2.3.5** A copy of the submitted plans will be returned duly stamped, with remarks related to the compliance with the rule requirements should the need arise.

**2.3.6** As a rule, modifications of the approved plans regarding items covered by classification are to be submitted.

**2.3.7** Design data to be submitted to the Society are to incorporate all information necessary for the assessment of the design of the ship for the purpose of assignment of class. It is the responsibility of the Interested Party to ascertain that the design data are correct, complete and compatible with the use of the ship.

**2.3.8** Design calculations are to be provided, when called for, as supporting documents to the submitted plans.

**2.3.9** Design data and calculations are to be adequately referenced. It is the duty of the Interested Party to ascertain that the references used are correct, complete and applicable to the design of the ship.

**2.3.10** The submitted plans are to contain all necessary information for checking the compliance with the requirements of the Rules.

**2.3.11** In the case of conflicting information, submitted documentation will be considered in the following order of precedence: design data, plans, design calculations.

**2.3.12** It is the responsibility of the Interested Party to ascertain that drawings used for the procurement, construction and other works are in accordance with the approved plans.

## 3 Ships classed after construction

### 3.1 General

**3.1.1** In this case, the class of the ship will be assigned upon a preliminary review of the documentation listed in [3.1.3] and subsequent satisfactory completion of the surveys, the extent and scope of which are given below.

### 3.1.2 Surveys

The extent and scope of the admission to class survey is to be not less than those required at the class renewal survey of a ship of the same age and type; in addition all other periodical surveys should be performed together with those inspections which are linked to specific service notations and/or additional class notations and/or special installations the ship is provided with.

In case of ships transferring class from another recognised Classification Society who have appropriate Naval (Military) Ships Rules, special consideration will be given to the scope of the surveys.

### 3.1.3 Documentation (1/1/2017)

As a general rule, the documentation to be supplied to the Society is not to be less than the following.

a) Main plans:

- general arrangement
- capacity plan
- loading manual, where required, which is to contain, as a minimum, loading cases, calculations of still water bending moments, and relevant documents, particulars of loading calculator and instruc-

tion booklet as per Society's requirements, according to the case

- hydrostatic curves and stability documents, if applicable (refer to Part B, Chapter 3)
  - damage stability calculations
- b) Hull structure plans:
- midship section
  - scantling plans
  - profile and deck plan
  - watertight bulkheads
  - rudder and rudder stock
  - shell expansion
  - hatch covers
- c) Machinery plans:
- engine room general arrangement
  - diagram of fuel- (transfer, service), bilge-, ballast-, lubricating oil-, cooling-, steam- and feed-, general service and starting compressed air piping
  - intermediate, thrust- and screw shafts
  - propeller
  - main engines, propulsion gears and clutch systems (or Manufacturer make, model and rating information)
  - diagram of fire-fighting systems
  - drawings of boilers and air receivers
  - drawings of steering gear systems, piping and arrangements and steering gear Manufacturer make and model information
  - torsional vibration calculations as per conditions laid down in Pt C, Ch 1, Sec 9. Such documents are required only for ships less than 2 years old or for older ships the propelling system of which has been modified during the two years preceding the classification
- d) Electrical installation plans and wiring diagrams:
- master plan of power distribution, lighting and emergency power circuits
  - single line diagram of networks and switchboards
  - wiring diagrams of main and emergency switchboard location and arrangement of electrical equipment in hazardous areas
- e) Additional plans required for ships with unattended machinery spaces
- instrument and alarm list
  - fire alarm system
  - list of automatic safety functions (e.g. slowdowns, shutdowns, etc.)
  - function testing plan

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

Additional documentation may be required.

### 3.1.4 Surveys (1/1/2017)

The Surveyor:

- a) checks that the outcome of the plan appraisal and survey instructions are available,
- b) surveys the ship to check that it complies with the outcome of the plan appraisal and with the requirements of Ch 3, Sec 2, [3.1.2],
- c) attends tests and trials provided for in the Rules.

### 3.1.5 Interim Certificate of Classification (1/1/2017)

Upon satisfactory completion of the survey for assignment of class, the Surveyor issues an Interim Certificate of Classification to the Owner, valid for not more than 5 months. This certificate indicates the class notations.

The certificate is issued with a Survey Endorsement Sheet where all outstanding recommendations and significant memoranda are recorded; class notations requested by the Owner and not assigned due to pending items are clearly indicated together with the relevant pending items.

### 3.1.6 Certificate of Classification (1/1/2017)

Upon satisfactory review of the survey reports, the Society issues the Certificate of Classification to the Owner, valid for the whole period of class. The certificate indicates the class notations.

All outstanding recommendations, significant memoranda and pending items for class notations not assigned are made available in the ship status.

### 3.1.7 Equivalence criterion

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. Special consideration will be given to ships of recent construction.

### 3.1.8 Additional service and/or class notations

For installations or equipment covered by additional service and/or class notations, the Society will determine the documentation to be submitted.

### 3.1.9 Other documentation

In addition, the Society may base its judgement upon documentation such as certificates issued or accepted by the former Classification Society, if any, moreover, other documents and/or plans may be specifically required to be supplied to the Society in individual cases.

## 4 Date of initial classification

### 4.1 Definitions

#### 4.1.1 Date of build (1/1/2017)

- a) For new construction:

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

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

b) After modifications:

After modifications are completed, the "date of build" remains assigned to the ship.

Where a complete replacement or addition of a major portion of the ship (see Note 1) is involved, the following applies:

- 1) the "date of build" associated with each major portion of the ship is indicated on the Certificate of Classification where it has been agreed that the newer structure is on a different survey cycle;
- 2) survey requirements are based on the "date of build" associated with each major portion of the ship;
- 3) survey due dates may be aligned, where appropriate.

Note 1: For example, a major portion of the ship may include a complete forward or after section, a complete block of deck structure or a structural modification of a single hull to a double hull ship.

#### 4.1.2 Date of initial classification for new buildings

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

#### 4.1.3 Date of initial classification for existing ships

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

#### 4.1.4 Period of class

The assigned period of class is never to exceed five (5) years. The 5 year period is granted only upon completion of the new building procedure and, for ships classed after construction, upon satisfactory outcome of a survey with the scope of a renewal survey.

If a ship classed after construction was previously classed with recognised Classification Society (see [3.1]) , the assigned period of class is never to go beyond the due date of the renewal survey assigned by the previous Society.

## 5 Reassignment of class

### 5.1

**5.1.1** At the request of the Owner, a ship which was previously classed with the Society, subsequently withdrawn from class and has not been classed since may have the class reassigned subject to an admission to class survey. If applicable and appropriate, account may be taken of any periodical surveys held in the former period of class with the Society.

## SECTION 2

## MAINTENANCE OF CLASS

### 1 General principles of surveys

#### 1.1 Survey types

**1.1.1** Classed ships are submitted to surveys for the maintenance of class. These surveys include the class renewal survey, intermediate and annual survey, bottom survey (either survey in dry condition or in-water survey), tailshaft survey, boiler survey, and surveys for the maintenance of additional class notations, where applicable. Such surveys are carried out at the intervals and under the conditions laid down in this Section. In addition to the above periodical surveys, ships are to be submitted to occasional surveys whenever the circumstances so require; refer to [11].

#### 1.1.2

The different types of periodical surveys are summarised in Tab 1. The intervals at which the periodical surveys are carried out are given in the items referred to in the second column of Tab 1. The relevant extent and scope are given in Chapter 3 and Chapter 4 for all ships and for service notations, respectively, while surveys related to additional class notations are given in Chapter 5.

Where there are no specific survey requirements for additional class notations assigned to a ship, equipment and/or arrangements related to these additional class notations are to be examined, as applicable, to the Surveyor's satisfaction at each class renewal survey for the main class.

The surveys are to be carried out in accordance with the relevant requirements in order to confirm that the hull, machinery, equipment and appliances comply with the

applicable Rules and will remain in satisfactory condition based on the understanding and assumptions mentioned in Ch 1, Sec 1, [3.3].

Where the conditions for the maintenance of main class, service notations and additional class notations are not complied with, the main class and/or the service notation and/or the additional class notations as appropriate can be suspended and/or withdrawn in accordance with the procedures given in [9].

Note 1: 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.

**1.1.3** Unless specified otherwise, any survey other than bottom survey and tailshaft survey may be effected by carrying out partial surveys at different times to be agreed upon with the Society, provided that each partial survey is adequately extensive. The splitting of a survey into partial surveys is to be such as not to impair its effectiveness.

#### 1.2 Change of periodicity, postponement or advance of surveys

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

**1.2.2** When a survey or recommendation becomes overdue during an operative mission, extension of class may be granted until the arrival of the ship at the first port of call after the end of the operative mission.

**Table 1 : List of periodical surveys**

Type of survey	Reference in this Section	Reference to scope of survey
Class renewal - hull	[4]	Ch 3, Sec 3 and Chapter 4 (1)
Class renewal - machinery	[4]	Ch 3, Sec 3 and Chapter 4 (1)
Annual - hull	[5.1]	Ch 3, Sec 1 and Chapter 4 (1)
Annual - machinery	[5.1]	Ch 3, Sec 1 and Chapter 4 (1)
Intermediate - hull	[6.1]	Ch 3, Sec 2 and Chapter 4 (1)
Intermediate - machinery	[6.1]	Ch 3, Sec 2 and Chapter 4 (1)
Bottom - dry condition	[7.1]	Ch 3, Sec 4
Bottom - in water	[7.1]	Ch 3, Sec 4
Tailshaft - complete	[8.1]	Ch 3, Sec 5
Tailshaft - modified	[8.1]	Ch 3, Sec 5
Boiler - complete	[9.1]	Ch 3, Sec 6
(1) As applicable, according to the service notation assigned to the ship		



### 1.3 Extension of scope of survey

**1.3.1** The Society and/or its Surveyors may extend the scope of the provisions in Chapter 3 to Chapter 5, which set forth the technical requirements for surveys, whenever and so far as considered necessary, or modify them in the case of special ships or systems.

**1.3.2** The extent of any survey also depends upon the condition of the ship and its equipment. Should the Surveyor have any doubt as to the maintenance or condition of the ship 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.

### 1.4 General procedure of survey

**1.4.1** The general procedure of survey consists in:

- an overall examination of the parts of the ship covered by the rule requirements
- checking selected items covered by the rule requirements
- attending tests and trials where applicable and deemed necessary by the Surveyor.

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

**1.4.3** During the surveys, the Surveyor does not check that the spare parts are kept on board, maintained in working order and suitably protected and lashed.

#### 1.4.4

As a general rule, all materials, machinery, boilers, auxiliary installations, equipment, items etc. (generally referred to as "products") which are covered by the class and used or fitted on board ships inspected by the Society during surveys after construction are to be new and, where intended for essential services as defined in Ch 1, Sec 1, [1.2.1], tested by the Society.

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

The requirements for the selection of materials to be used in the construction or repair of the various parts of existing ships, the characteristics of products to be used for such parts and the checks required for their acceptance are to be as stated in Part C and Part D of the Rules for the Classification of the Ships., as applicable, or in other Parts of the Rules or as specified on approved plans. In particular, the testing of products manufactured according to quality assurance procedures approved by the Society and the approval of such procedures are governed by the requirements of Pt D, Ch 1, Sec 1, [3] of the Rules for the Classification of the Ships.

### 1.5 Appointment of another Surveyor

**1.5.1** In compliance with the provisions of Ch 1, Sec 1, [2.5.1], should a disagreement arise between the Owner

and the Surveyor during a survey, the Society may, at the request of the Owner, designate another Surveyor.

### 1.6 Accreditation of surveys carried out by the Owner

#### 1.6.1

At discretion of the Society, when the Owner adopt, and provide evidence about, a suitable policy for the safety of life at sea and for the prevention of damages to properties and persons and pursues these goals with a safety management system based on suitable resources and organisation, when the logistic and / or operating conditions of the vessel, except for what indicated in [1.2.2], doesn't allow the intervention of Surveyors of the Society, surveys for the maintenance of the validity of the Certificate of Classification may be carried out by qualified personnel of the Owner.

#### 1.6.2

For the purposes of [1.6.1], the capability of Owner to develop, implement and maintain an adequate safety management system will be evaluated by the Society through the examination of the following functional requirements:

- Policies for maritime safety and for the prevention of damages to properties and persons;
- Defined levels of responsibility and lines of communication between personnel at shore and onboard and within them;
- Instructions and procedures to ensure the operational safety of ships in accordance with internal guidelines;
- Procedures for reporting accidents and non-compliance in respect of the given guidelines;
- Procedures promptly face emergency situations;
- Procedures for internal audits and reviews of the management system.

#### 1.6.3

The technical conditions and procedures for accreditation of surveys carried out by the Owner will be governed by a special agreement between the Society and the Owner, which will define:

- The minimum requirements for the safety management system referred to in [1.6.2] and the regulation for the assessment and verifications carried out by the Society;
- Type of surveys that can be carried out by the Owner, technical personnel qualified for the surveys and eventual specific limitations;
- Communications, procedures and forms for reporting of surveys;
- Conditions for the maintenance of the validity of the Certificate of Classification.

#### 1.6.4

If, during the period of validity of the Agreement in [1.6.3], the minimum requirements for the accreditation of surveys carried out by the owner are lost, the standard criteria for class maintenance referred to in [1.1] and [1.2] will apply until the conditions of the Agreement will be restored.

## 2 Definitions and procedures related to surveys

### 2.1 General

#### 2.1.1 Period of class

Period of class means the period starting either from the date of the initial classification, see Sec 1, [4], or from the credited date of the last class renewal survey, and expiring at the limit date assigned for the next class renewal survey.

#### 2.1.2 Anniversary date

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

#### 2.1.3 Survey time window

Survey time window, or more simply window, mean the fixed period during which annual and intermediate surveys are to be carried out.

#### 2.1.4 Overdue surveys

Each periodical survey is assigned a limit date specified by the relevant requirements of the Rules (end of survey interval or end date of window) by which it is to be completed.

Provided what stated in [1.2], a survey becomes overdue when it has not been completed by its limit date.

Examples:

- Anniversary date: 15th April  
The 2000 annual survey can be validly carried out from 16th January 2000 to 15th July 2000. If not completed by 15th July 2000, the annual survey becomes overdue.
- Last bottom survey 20th October 2000 (periodicity 2.5 years, with a maximum interval between successive examinations not exceeding 3 years)  
The next bottom survey is to be carried out before 20th October 2003. If not completed by 20th October 2003, the bottom survey becomes overdue.

#### 2.1.5 Recommendations

Provided what stated in [1.2], a recommendation is a requirement to the effect that specific measures, repairs and/or surveys are to be carried out within a specific time limit in order to retain classification.

A recommendation is pending until it is cleared. Where it is not cleared by its limit date, the recommendation is overdue.

#### 2.1.6 Memoranda

Those defects and/or deficiencies which do not affect the maintenance of class and which may therefore be cleared at the Owner's convenience and any other information deemed noteworthy for the Society's convenience are indicated as memoranda. Memoranda are not to be regarded as recommendations.

## 2.2 Terminology related to hull survey

### 2.2.1 Ballast tank

A ballast tank is a tank which is used solely for salt water ballast: A tank which is used for both cargo and salt water

ballast will be treated as a ballast tank when substantial corrosion has been found in such tank, see [2.2.8].

### 2.2.2 Spaces

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

### 2.2.3 Overall survey

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

### 2.2.4 Close-up survey

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

### 2.2.5 Transverse section

A transverse section includes all longitudinal members contributing to longitudinal hull girder strength, such as plating, longitudinals and girders at the deck, side shell, bottom, inner bottom, longitudinal bulkheads, and sloped plating in upper and lower side tanks, as well as relevant longitudinals, as applicable for the different ships. For a transversely framed ship, a transverse section includes adjacent frames and their end connections in way of transverse sections.

### 2.2.6 Representative tanks or spaces

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

### 2.2.7 Renewal thickness (1/1/2017)

Renewal thickness ( $t_{ren}$ ) is the minimum allowable thickness, in mm, below which renewal of structural members is to be carried out.

### 2.2.8 Substantial corrosion

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

### 2.2.9 Suspect areas

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

### 2.2.10 Critical Structural Area

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

### 2.2.11 Corrosion Prevention System

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

Hard Protective Coating is usually to be epoxy coating or equivalent.

Protective coating should usually be epoxy coating or equivalent. Other coating systems may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the Manufacturer's specifications.

**2.2.12 Coating condition**

Coating condition is defined as follows:

- good: condition with only minor spot rusting
- fair: condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for poor condition
- poor: condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

**2.2.13 Special consideration**

Special consideration or specially considered (in connection with close-up surveys and thickness measurements) means sufficient close-up inspection and thickness measurements

are to be taken to confirm the actual average condition of the structure under the coating.

**2.2.14 Prompt and Thorough Repair**

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

**2.2.15 Pitting corrosion (1/1/2017)**

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 intensity is defined in App 2, Figure 12.

**2.2.16 Edge corrosion (1/1/2017)**

Edge corrosion is defined as local corrosion at the free edges of plates, stiffeners, primary support members and around openings. An example of edge corrosion is shown in Figure 1.

**2.2.17 Grooving corrosion (1/1/2017)**

Grooving corrosion is typically local material loss adjacent to weld joints along abutting stiffeners and at stiffener or plate butts or seams. An example of groove corrosion is shown in Figure 2.

**Figure 1 : Edge corrosion (1/1/2017)**

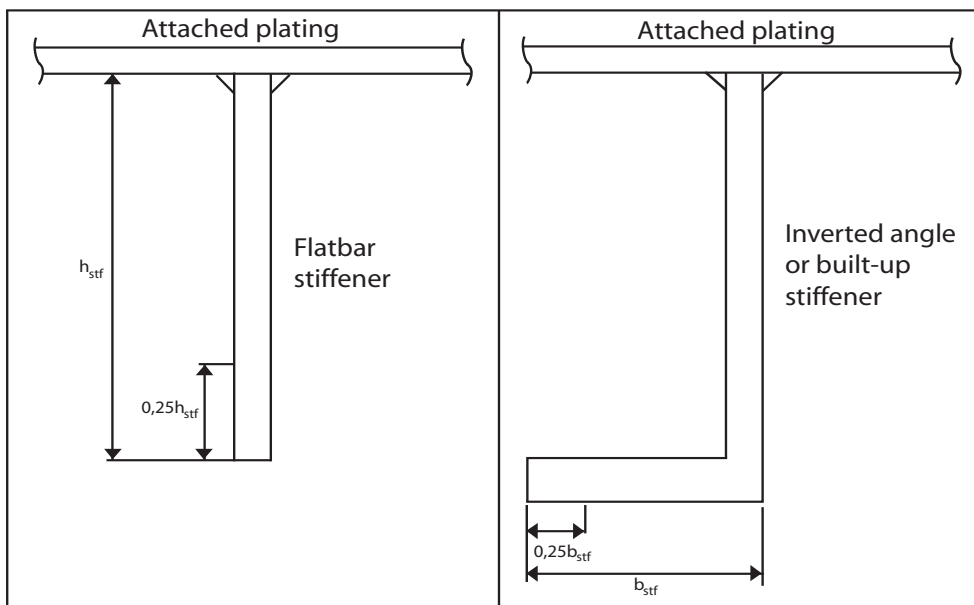
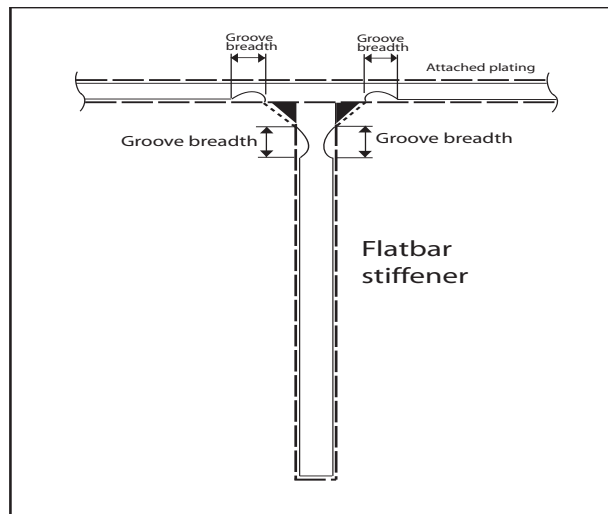


Figure 2 : Grooving corrosion (1/1/2017)



## 2.3 Procedural requirements for thickness measurements

### 2.3.1 Control of the process

When required as per the scope of surveys defined below, thickness measurements are normally to be carried out under the responsibility of the Owner, in the presence of the Surveyor.

The thickness measurements required, if not carried out by the Society itself are to be witnessed by a Surveyor of the Society. The Surveyor is to be on board to the extent necessary to control the process.

This also applies to thickness measurements taken during voyages. The attendance of the Surveyor will be recorded.

Note 1: Also refer to IACS Recommendation no. 77 "Guidelines for the Surveyor on how to control the thickness measurement process".

### 2.3.2 Survey meeting (1/1/2017)

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

Communication with the thickness measurement operator(s) and Owner's representative(s) is to be agreed during the meeting, with respect to the following:

- a) reporting of thickness measurements on a regular basis to the attending Surveyor

- b) prompt notification to the Surveyor in the case of following findings:

- 1) excessive and/or extensive corrosion or pitting/grooving of any significance
- 2) structural defects like buckling, fractures and deformed structures
- 3) detached and/or holed structure
- 4) corrosion of welds.

When thickness measurements are taken in association with intermediate or renewal survey, a documented record indicating where and when the meeting took place and who attended (the name of the surveyor(s), the master of the ship or an appropriately qualified representative appointed by the master or Company, the owner's representative(s) and the representative(s) of the thickness measurement firm(s) is to be maintained.

### 2.3.3 Thickness measurements and close-up surveys

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

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

**2.3.4 Approval of thickness firms** Thickness measurements are to be carried out by a firm approved by the Society in accordance with the "Rules for the Certification of Service Suppliers", unless the measurements are carried out directly by qualified personnel of the Naval Authority.

### 2.3.5 Monitoring of the thickness measurement process on board

The Surveyor will decide the final extent and location of thickness measurements after overall survey of representative spaces on board.

If the Owner prefers to commence the thickness measurements prior to the overall survey then the Surveyor will

advise that the planned extent and locations of thickness measurements are subject to confirmation during the overall survey.

Based on findings, the Surveyor may require additional thickness measurements to be taken.

The Surveyor will direct the gauging operation by selecting locations such that, on average, readings taken represent the condition of the structure for that area.

Thickness measurements taken mainly to evaluate the extent of corrosion which may affect the hull girder strength are to be carried out systematically in all longitudinal structural members that are required to be gauged by the relevant provisions of the Rules.

Where thickness measurements indicate substantial corrosion or wastage in excess of allowable diminution, the Surveyor will direct locations for additional thickness measurements in order to delineate areas of substantial corrosion and to identify structural members for repairs/renewals.

### 2.3.6 Review and verification

Upon completion of the thickness measurements, the Surveyor will confirm that no further gaugings are needed, or specify additional gaugings.

If, where special consideration is allowed by the Rule requirements, the extent of thickness measurements is reduced, the Surveyor's special consideration will be reported.

If thickness measurements are partly carried out, the extent of the remaining measurements will be reported for the use of the next Surveyor.

### 2.3.7 Thickness measurement report

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

The report is validated by the Surveyor.

### 2.3.8 Acceptance criteria

For acceptance criteria applicable to structural corrosion diminution levels, reference is to be made to App 2.

**2.3.9 Evaluation of longitudinal strength** The ship's longitudinal strength is to be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the class renewal survey carried out after the ship reached 10 years of age in accordance with the criteria for longitudinal strength of the ship's hull girder specified in App 2, [4.3.5].

## 2.4 Agreement of firms for in-water survey

**2.4.1** The in-water surveys referred to in the Rules are to be carried out by a certified company accepted by the Society.

Note 1: The specific Rules of the Society give details about the certification.

## 2.5 Conditions for surveys

### 2.5.1 (1/1/2017)

The Owner is to provide the necessary facilities for the safe execution of the surveys, as per Ch 1, Sec 1, [3.2].

- a) In order to enable the attending Surveyors to carry out the survey, provisions for proper and safe access are to be agreed between the Owner and the Society, these are also to be in accordance with the provisions of IACS PR 37;
- b) in cases where the provisions made for safety and required access are judged by the attending Surveyors to be inadequate, the survey of the spaces involved is not to proceed.

### 2.5.2

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

### 2.5.3

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

### 2.5.4

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

### 2.5.5 (1/1/2017)

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

- ceilings in holds and floors in the engine room are to be lifted to the necessary extent for examination of the structure
- cement or other protective sheathing is to be removed when there is any doubt as to the condition of the plating underneath or when adherence to plating is not tight
- in the case of solid ballast spaces, the solid ballast is to be partially removed for examination of the condition of the structure in way. Should doubts arise, the Surveyor may require more extensive removal of the solid ballast
- in refrigerated cargo spaces the condition of the coating behind the insulation is to be examined at representative locations. The examination may be limited to verification that the protective coating remains effective and that there are no visible structural defects. Where poor coating condition is found, the examination is to be extended as deemed necessary by the Surveyor. The condition of the coating is to be reported. If indents, scratches, etc. are detected during surveys of shell plating from the outside, insulations in way are to be

removed as required by the Surveyor, for further examination of the plating and adjacent frames

- where soft or semi-hard coatings have been applied, safe access is to be provided for the Surveyor to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures which may include spot removal of the coating. When safe access cannot be provided, the soft or semi-hard coating is to be removed
- casings, ceilings or linings, and loose insulation, where fitted, are to be removed, as required by the Surveyor, for examination of plating and framing. Compositions on plating are to be examined and sounded, but need not be disturbed if found adhering satisfactorily to the plating.

## 2.6 Access to structures

### 2.6.1

For overall survey, means are to be provided to enable the Surveyor to examine the structure in a safe and practical way.

### 2.6.2 (1/1/2017)

When required in relation to the characteristics of the space, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- permanent staging and passages through structures
- temporary staging and passages through structures
- hydraulic arm vehicles such as conventional cherry pickers, lifts and moveable platforms
- boats or rafts
- portable ladders
- other equivalent means (see Note 1).

Note 1: For guidance refer to IACS Recommendation No. 91 "Guidelines for Approval / Acceptance of Alternative Means of Access".

## 2.7 Equipment for surveys

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

- radiography (X or  $\gamma$  rays)
- ultrasonic test
- magnetic particle test
- dye penetrant test.

### 2.7.2

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

### 2.7.3

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

### 2.7.4

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

### 2.7.5

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

## 2.8 Rescue and emergency response equipment

### 2.8.1 (1/1/2017)

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

## 2.9 Surveys at sea and anchorage

2.9.1 Surveys at sea or at anchorage may be accepted provided the Surveyor is given the necessary assistance by the personnel on board. Precautions and procedures for carrying out the survey are to be in accordance with [2.5], [2.6] and [2.7].

### 2.9.2

A communication system is to be arranged between the survey party in the tank or space and the responsible officer on deck.

This system is also to include the personnel in charge of ballast pump handling if boats or rafts are used.

### 2.9.3

Surveys of tanks by means of boats or rafts may only be undertaken with the agreement of the Surveyor, who is to take into account the safety arrangements provided, including weather forecasting and ship response under foreseeable conditions and provided the expected rise of water within the tank does not exceed 0,25m.

### 2.9.4

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

- only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, are to be used;
- the boat or raft is to be tethered to the access ladder and an additional person is to be stationed down the access ladder with a clear view of the boat or raft;
- appropriate lifejackets are to be available for all participants;
- the surface of water in the tank is to be calm (under all foreseeable conditions the expected rise of water within the tank is to not exceed 0,25 m) and the water level stationary. On no account is the level of the water to be rising while the boat or raft is in use;
- the tank, hold or space is to contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable;
- at no time is the water level to be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses is only to be contemplated if a deck access man-hole is fitted and open in the bay being examined, so

that an escape route for the survey party is available at all times. Other effective means of escape to the deck may be considered;

- g) if the tanks (or spaces) are connected by a common venting system, or inert gas system, the tank in which the boat or raft is to be used is to be isolated to prevent a transfer of gas from other tanks (or spaces).

## 2.10 Repairs and maintenance during voyage

### 2.10.1 (1/1/2017)

Repairs to hull, machinery or other equipment, which affect or may affect the class, which are carried out by a riding crew during a voyage or an operative mission, including any repair resulting from maintenance and overhauls in accordance with the Manufacturer's recommended procedures or established marine practice, are to be noted in the ship's log and submitted to the attending Surveyor when he boards the ship for use in determining further survey requirements.

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

## 2.11 Prompt and thorough repairs

### 2.11.1

Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which affects or, in the opinion of the Surveyor, will affect the ship's structural, watertight or weathertight integrity, is to be promptly and thoroughly (see [2.2.14]) repaired. Areas to be considered include, as far as applicable, the following:

- side structure and side plating;
- deck structure and deck plating;
- bottom structure and bottom plating;
- inner bottom structure and inner bottom plating;
- inner side structure and inner side plating;
- longitudinal bulkhead structure and longitudinal bulkhead plating, where fitted;
- transverse watertight or oiltight bulkhead structure and transverse watertight or oiltight bulkheads plating;
- hatch covers and hatch coamings, where fitted;
- weld connection between air pipes and deck plating;
- air pipe heads installed on the exposed decks;
- ventilators, including closing devices, if any;
- bunker and venting piping systems (only for ships subject to Ch 4, Sec 2 and Ch 4, Sec 9).

For locations where adequate repair facilities are not available, consideration may be given to allow the ship to proceed directly to a repair facility or, upon request of the Naval Authority, continue operational activities with or without limitation. This may require temporary repairs for the intended voyage and service.

### 2.11.2

Additionally, when a survey results in the identification of structural defects or corrosion, either of which, in the opinion of the Surveyor, will impair the ship's fitness for continued service, remedial measures are to be implemented before the ship continues in service or the class is suspended in agreement with the Naval Authority (see [14]).

### 2.11.3 (1/1/2017)

Where the damage found on structure mentioned in [2.11.1] is isolated and of a localised nature which does not affect the ship's structural integrity, consideration may be given by the surveyor to allow an appropriate temporary repair to restore watertight or weather tight integrity and impose a Recommendation in accordance with [2.13], with a specific time limit.

## 2.12 Survey attendance requirements

### 2.12.1 Qualification of Surveyors

Surveyors are to be qualified for the survey processes involved.

### 2.12.2 Documentation of attendance on board

The attendance on board of the Surveyors will be documented according to the Society's procedures.

## 2.13 Procedure for imposing and clearing recommendations

### 2.13.1 Reasons for imposing recommendations

Recommendations are to be imposed for the following reasons:

- a) repairs and/or renewals related to damage that affect classification (e.g. grounding, structural damage, machinery damage, wastage over the allowable limits, etc.);
- b) supplementary survey requirements;
- c) temporary repairs.

### 2.13.2 Recommendations for repairs

For repairs not completed at the time of survey, a recommendation is to be imposed. In order to provide adequate information to the Surveyor attending for survey of the repairs, the recommendation is to be sufficiently detailed with identification of items to be repaired. For identification of extensive repairs, reference may be given to the survey report.

### 2.13.3 Recommendations with service limitations

Recommendations may require imposing limitations related to navigation and operation that are deemed necessary for continued operation under classification (e.g. loss of anchor and/or chain, etc.); such limitations are to be agreed with the Naval Authority in respect to the operative requirements of the ship.

**2.13.4 Issue of recommendations**

Recommendations are to be given in writing with a time limit for completion to the Owner's representatives/Ship's Master, and are to be clearly stated on the Certificate of Classification or an attachment to the Certificate of Classification and/or class survey status or report.

**2.13.5 Notification of recommendations**

Owners will be notified of these dates and that the vessel's class may be subject to a suspension procedure if the item is not dealt with, or postponed, by the due date (see [9]).

**2.13.6 Clearance of recommendations**

Clearance of recommendations is to be supported by a survey report giving details of all associated repairs and/or renewals, or of the supplemental surveys carried out. Repairs carried out are to be reported with identification of:

- a) compartment and location
- b) structural member
- c) repair method
- d) repair extent
- e) NDT/Tests.

**2.13.7 Recommendations partially dealt with**

Partially dealt with recommendations are to be supported by a survey report giving details of repairs and/or renewals, or of that part of the supplemental surveys carried out and those parts remaining outstanding.

**3 Certificate of Classification: issue, validity, endorsement and renewal****3.1 Issue of Certificate of Classification**

**3.1.1** A Certificate of Classification, bearing the class notations assigned to the ship and an expiry date, is issued to any classed ship.

**3.1.2** A Provisional Certificate of Classification may serve as a Certificate of Classification in some cases, such as after an admission to class survey, or when the Society deems it necessary.

**3.1.3** The Certificate of Classification or Provisional Certificate of Classification is to be made available to the Society's Surveyors upon request.

**3.2 Validity of Certificate of Classification, maintenance of class**

**3.2.1** According to Ch 1, Sec 1, [2.4], the Society alone is qualified to confirm the class of the ship and the validity of its Certificate of Classification.

**3.2.2**

During the class period, a Certificate of Classification is valid when it is not expired.

The class is maintained during a certain period or at a given date, when during the said period or at such date the class is not suspended or withdrawn according to [14].

**3.2.3** Classification-related documents and information are liable to be invalidated by the Society whenever their object is found to differ from that on which they were based or to be contrary to the applicable requirements. The Owner is liable for any damage which may be caused to any third party from improper use of such documents and information.

**3.3 Endorsement of Class****3.3.1 Purpose of endorsements**

The endorsements of Class give official evidence of:

- a) class surveys carried out,
- b) class validity, and
- c) conditions imposed and/or main items out of service (if any).

**3.3.2 Direct endorsement of the Certificate of Classification**

The Certificate of Classification is directly endorsed before the vessel sails where an Annual, Intermediate or Class Renewal Survey is completed, using the appropriate section of the Certificate of Classification.

A section is also available for postponement of the Class Renewal Survey.

**3.3.3 Class Survey Endorsement Sheet** In addition to the direct endorsement of the Certificate of Classification, as described in [3.3.2], a Class Survey Endorsement Sheet is issued before the ship sails, where any Class Survey is carried out. It can be issued by the Surveyor through Leonardo Ship or as an interim paper form (available in the Database Forms).

The Class Survey Endorsement Sheet is an attachment to the Certificate of Classification, and as such, it is to be available on board at any time.

**3.3.4 Possible modifications to endorsements**

The Society reserves the right to modify the endorsements made by Surveyors.

**3.4 Status of surveys and recommendations**

**3.4.1** Information given in the Certificate of Classification, associated endorsements, Rules and specific documents enables the Owner to identify the status of surveys and recommendations.

**3.4.2**

The omission of such information does not absolve the Owner from ensuring that surveys are held by the limit dates and pending recommendations are cleared.

**4 Class renewal survey****4.1 General principles**

**4.1.1** The first class renewal survey is to be completed within 5 years from the date of the initial classification survey and thereafter 5 years from the credited date of the previous class renewal survey. However, consideration may be



given by the Society to granting an extension for a maximum of three months after the limit date, in exceptional circumstances and provided that the ship is attended and the attending Surveyor so recommends. In such cases the next period of class will start from the limit date for the previous class renewal survey before the extension was granted.

**4.1.2** For surveys completed within three months before the limit date of the class renewal survey, the next period of class will start from this limit date. For surveys completed more than three months before the limit date, the period of class will start from the survey completion date.

**4.1.3 (1/1/2017)**

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 carry out only 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 special survey due, the period of class will start from the survey completion date.

**4.1.4** A new period of class is assigned to the ship after the satisfactory completion of the class renewal survey, and a new Certificate of Classification with relevant annexes is issued for the new period of class.

**4.1.5**

Concurrent crediting to both intermediate survey and class renewal survey for surveys and thickness measurements of spaces is not acceptable.

**4.2 Normal system**

**4.2.1** When the normal system is applied, the class renewal survey may be commenced at the fourth annual survey and continued during the following year with a view to completion by its due date. In this case the survey may be carried out by partial surveys at different times. The number of checks to be performed at each partial survey and the interval between partial surveys are to be agreed by the Society. In general, the first partial survey should include a significant number of thickness measurements, where required by the Rules.

**4.2.2** A class renewal survey may be commenced before the fourth annual survey at the request of the Owner. In this case, the survey is to be completed within fifteen months. The conditions for the execution of partial surveys are the same as those referred to in [4.2.1].

**4.3 Continuous survey system**

**4.3.1** The request by the Owner for admission to the continuous survey system will be considered by the Society and agreement depends on the type and age of hull and machinery. This system may apply to the class renewal survey of hull, machinery or other installations such as refrigerating installations covered by an additional class notation.

**4.3.2** The continuous survey system is not applicable to the class renewal survey of the hull of ships over 20 years old. However, consideration may be given, at the discretion of the Society, to the applicability of the continuous survey

system to the class renewal survey of the hull of ships over 20 years old.

**4.3.3**

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

**4.3.4** When the continuous survey system is applied, appropriate notations are entered in the Certificate of Classification.

**4.3.5** Ships subject to the continuous survey system are provided with lists of items to be surveyed under this system; these lists are attached to the Certificate of Classification.

**4.3.6**

For items inspected under the continuous survey system, the following requirements generally apply:

- a) the interval between two consecutive surveys of each item is not to exceed five years
- b) the items are to be surveyed in rotation, so far as practicable ensuring that approximately equivalent portions are examined each year
- c) the Society may credit for continuous survey results of inspections carried out before the admission to the continuous survey scheme
- d) each item is to be surveyed at one time, as far as practicable; the Society may, however, allow possible repair work to be carried out within a certain period.
- e) the Surveyor may, at his discretion, extend the inspection to other items, if previous inspections carried out revealed any defects.

**4.3.7** For ships under continuous survey, items not included in the continuous survey cycle are to be inspected according to the provisions given in [4.2].

**4.3.8** Upon application by the Owner, the Society may agree, subject to certain conditions, that some items of machinery which are included in the continuous survey cycle are examined by the Chief Engineer where the Society is not represented.

The Chief Engineer is to be certified for this purpose by the Society and his examination is to be followed by a confirmatory survey carried out by a Surveyor. The conditions for the application of this procedure are given in Pt A, Ch 2, App 1 of the Rules for the Classification of Ships.

**4.3.9**

Ships on the continuous survey system are not exempt from other periodical surveys.

**4.3.10** A general examination of the ship, as detailed in Ch 3, Sec 1 for annual surveys, is to be carried out at the end of the period of class.

**4.3.11**

The survey in dry dock may be held at any time within the five-year class period, provided all the requirements of Ch 3, Sec 4, [2] are also complied with.

**4.3.12** For laid-up ships, specific requirements given in [13.1] apply.

**4.3.13** The continuous survey system may be discontinued at any time at the discretion of the Society, or at the request of the Owner, and a specific arrangement devised.

#### 4.4 Planned maintenance system (PMS-CBM) for machinery

**4.4.1** A planned maintenance system may be considered as an alternative to the continuous survey system for machinery and is limited to components and systems covered by it. When such a system approved by the Society is implemented, a survey scheme other than those normally adopted and with intervals different from those of the continuous survey system as detailed in [4.3] may be accepted.

##### 4.4.2

The conditions for approval of the planned maintenance system, the determination of survey item intervals and the general scope of surveys are detailed in Pt F, Ch 12, Sec 1 of the Rules for the Classification of Ships.

##### 4.4.3

When the planned maintenance system is applied, the notation **PMS** is entered on the Certificate of Classification.

If condition based maintenance is applied as per Pt F, Ch 12 of the Rules for the Classification of Ships, the notation **PMN-CM**( ), completed as appropriate inside brackets, is entered on the Certificate of Classification.

**4.4.4** The planned maintenance system does not supersede the annual surveys and other periodical surveys.

**4.4.5** A general examination of the machinery, as detailed in Ch 3, Sec 1 for annual surveys, is to be carried out at the end of the period of class.

**4.4.6** The planned maintenance system may be discontinued at any time at the discretion of the Society, or at the request of the Owner, and a specific arrangement devised.

## 5 Annual surveys

### 5.1

**5.1.1** In the five-year period of class, five annual surveys are to be carried out. The first to fourth annual surveys have a six-month window, i.e. from three months before to three months after each anniversary date, while the fifth annual survey has only a three-month window, i.e. from three months before to the fifth anniversary date.

## 6 Intermediate surveys

### 6.1

**6.1.1** An intermediate survey, where applicable, is to be carried out within the window from three months before the second to three months after the third anniversary date.

**6.1.2** The intermediate survey is applicable at any period of class to ships which are five years old and over.

**6.1.3** The internal examination of ballast spaces and cargo holds or tanks, as applicable, carried out the 2<sup>nd</sup> or 3<sup>rd</sup> annual survey are credited towards the intermediate survey.

### 6.1.4

Concurrent crediting to both intermediate survey and class renewal survey for surveys and thickness measurements of spaces is not acceptable.

## 7 Bottom survey

### 7.1

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

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

### 7.1.3

There is to be a minimum of two examinations of the outside of the ship's bottom and related items during each five-year class renewal survey period. One such examination is to be carried out in conjunction with the special survey. In all cases the interval between any two such examinations is not to exceed 36 months. Consideration may be given at the discretion of the Society to any special circumstances justifying an extension of these intervals.

### 7.1.4

Examinations of the outside of ship's bottom and related items of ships are normally to be carried out with the ship in drydock. However, consideration may be given to alternate examination while the ship is afloat as an In-water Survey, subject to the provisions of Ch 3, Sec 4, [3].

Special consideration is to be given to ships of 15 years or over before being permitted to have such examinations.

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

## 8 Shaft survey

### 8.1 General

#### 8.1.1 Definition (1/1/2017)

Shaft survey means survey of propeller shafts and tube shafts as well as survey of other propulsion systems.

For surveys of propeller shaft and tube shafts of ships delivered on or after 1 January 2016, the scheme in 8.2 is to be applied.

For surveys of propeller shaft and tube shafts of ships delivered before 1 January 2016 the following apply:

- a) First periodical survey (shaft complete survey or shaft modified survey, whichever comes first) due after 1 Jan-

uary 2016, according to the scheme in 8.3 or 8.4 as applicable

- b) Subsequent periodical surveys according to the scheme in 8.2.

For surveys of other propulsion systems, the scheme in 8.6 is to be applied.

## 8.2 Surveys of Propeller Shafts and Tube Shafts

### 8.2.1 Application (1/1/2017)

Unless alternative means are provided to ensure the condition of the propeller shaft assembly, these requirements apply to all vessels with conventional shafting fitted with a propeller.

Three survey methods, as detailed in Ch 3, Sec 7, [2], are considered for shafts lubricated by oil or fresh water in a closed loop system. The methods are to be applied according to the provisions of [8.2.3].

One survey method, as detailed in Ch 3, Sec 7, [2], is considered for shafts lubricated by water in an open loop system. The methods are to be applied according to the provisions of [8.2.4].

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

Three kinds of survey extensions, as detailed in Ch 3, Sec 7, [2] may be applied to shafts lubricated by oil or fresh water in a closed loop system, according to the provisions of [8.2.3], in order to extend the shaft survey due date.

Two kinds of survey extensions, as detailed in Ch 3, Sec 7, [2] may be applied to shafts lubricated by water in an open loop system, according to the provisions of [8.2.4], in order to extend the shaft survey due date.

### 8.2.2 Definitions (see also Fig 3) (1/1/2017)

- a) Shaft

Shaft is a general definition that includes:

- Propeller shaft
- Tube shaft

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

- b) Propeller Shaft

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

- c) Tube Shaft

Tube shaft is a shaft placed between the intermediate shaft and propeller shaft, normally arranged within a stern tube or running in open water.

It may also be called Stern Tube Shaft.

- d) Stern tube

Tube or pipe fitted in the shell of a ship at the stern (or rear part of the ship), below the waterline, through which the tube shaft or aftermost section of the propeller shaft passes. The stern tube is the housing of the shaft bearings, generally two (one aft and one fore), that sus-

tain the shaft and allow its rotation with less frictional resistance. The stern tube also accommodates the shaft sealing arrangement.

- e) Closed Loop (system) Oil Lubricated bearing

Closed loop oil lubricating systems use oil to lubricate the bearings and are sealed against the environment (seawater) by adequate sealing/gland devices.

- f) Water Lubricated Bearing

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

- g) Closed Loop System Fresh Water Lubricated Bearing

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

- h) Open Systems (water)

Open water lubricating systems use water to lubricate the bearings and are exposed to the environment.

- i) Adequate means for protection against corrosion

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

Typical means are for example:

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

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

- j) Corrosion Resistant Shaft

The corrosion resistant shaft is made of approved corrosion resistant steel as core material for the shaft.

- k) Stern tube Sealing System

The stern tube sealing system is the equipment installed on the inboard extremity and, for closed systems, at the outboard extremity of the stern tube.

The inboard seal is the device fitted on the fore part of the stern tube that achieves a seal against possible leakage of the lubricant media within the ship's interior.

The outboard seal is the device fitted on the aft part of the stern tube that achieves a seal against possible sea water ingress and leakage of the lubricant media.

- l) Service records

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

## m) Oil sample examination

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

## n) Lubricating oil analysis

Lubricating oil analysis is to be carried out at regular intervals not exceeding six (6) months taking into account IACS Rec. 36.

The documentation on lubricating oil analysis is to be available on board.

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

## o) Fresh water sample test

The fresh water sample test should be carried out at regular intervals not exceeding six (6) months.

Samples are to be taken under service conditions and are to be representative of the water circulating within the stern tube.

Analysis results are to be retained on board and made available to the surveyor.

At the time of survey, the sample for the test is to be taken in the presence of the surveyor.

The fresh water sample test is to include the following parameters:

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

## p) Keyless connection

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

## q) Keyed connection

Keyed connection is the forced coupling methodology between the shaft and the propeller with a key and key-way, achieved through the interference fit of the propeller boss on the shaft tapered end.

## r) Flanged connection

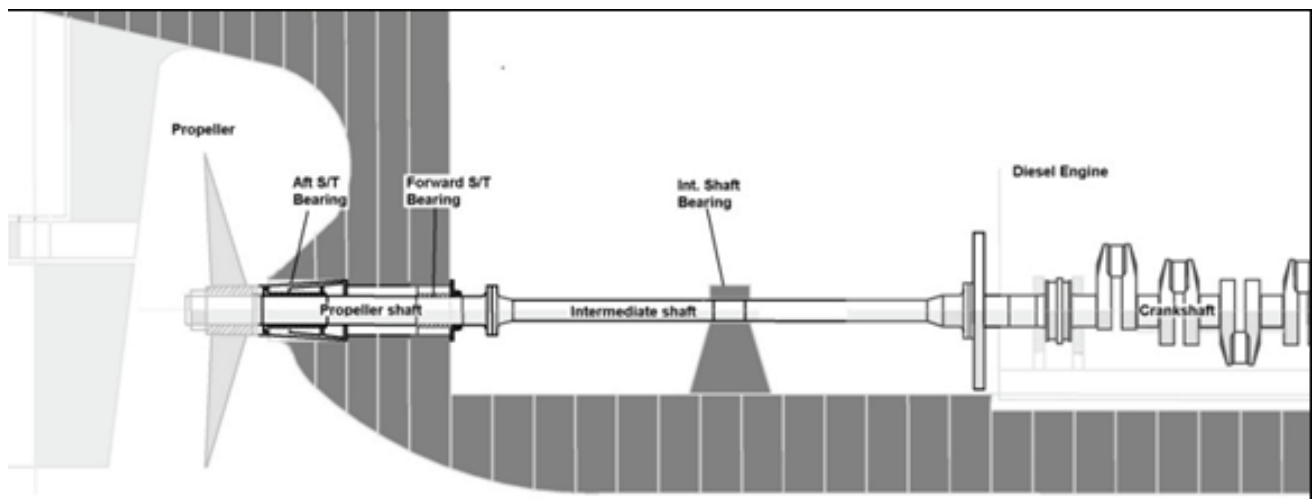
Flanged connection is the coupling methodology, between the shaft and the propeller, achieved by a flange, built in at the shaft aft end, bolted to the propeller boss.

## s) Alternative means

Shafting arrangements such as, but not limited to, an approved Condition Monitoring Scheme and / or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods as applicable in IACS UR Z21.

The shaft to which the additional class notation **MON-SHAFT** is assigned is to be considered as shafting having a configuration other than described in the present paragraph.

Figure 3 : Typical Shafting Arrangement (1/1/2017)



**8.2.3 Oil Lubricated Shafts or Closed Loop System Fresh Water Lubricated Shafts (refer also to Table 2) (1/1/2017)**

a) Oil lubricated shaft survey intervals

1) Flanged propeller connection

The following methods are applicable:

- Method 1 every 5 years, or
- Method 2 every 5 years (pre-requisites have to be fulfilled), or
- Method 3 every 5 years (pre-requisites have to be fulfilled)

2) Keyless propeller connection

The following methods are applicable:

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

The maximum interval between two surveys carried out according to method 1 or method 2 is not to exceed 15 years, except in the case when one extension for no more than three months is granted

3) Keyed propeller connection

The following methods are applicable:

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

b) Fresh water lubricated shafts (closed loop system) survey intervals

For all types of coupling, the maximum interval between two surveys carried out according to method 1 is not to exceed 15 years. An extension for no more than three months can be granted

1) Flanged propeller connection

The following methods are applicable:

- Method 1 every 5 years, or
- Method 2 every 5 years (pre-requisites have to be fulfilled), or
- Method 3 every 5 years (pre-requisites have to be fulfilled)

2) Keyless propeller connection

The following methods are applicable:

- Method 1 every 5 years, or
- Method 2 every 5 years (pre-requisites have to be fulfilled), or
- Method 3 every 5 years with the maximum of two consecutive method 3 surveys (pre-requisites have to be fulfilled).

3) Keyed propeller connection

The following methods are applicable:

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

c) Survey extensions

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

- 1) Extension up to a maximum of 2.5 years, no more than one extension can be granted. In the event an additional extension is requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.
- 2) Extension up to a maximum of 1 year, no more than two consecutive extensions can be granted. No further extension, of other type, can be granted.
- 3) Extension up to a maximum of 3 months, no more than one "three months extension" can be granted. In the event an additional extension is requested the requirements of the "one year extension" or "2.5 years extension" are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of one year or 2.5 years.

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

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

For fresh water lubricated shafts (closed loop system), the maximum interval between two surveys carried out according to method 1 is not to exceed 15 years, except in the case when one extension for no more than three months is granted.

**Table 2 : Survey Intervals (closed systems) (1/1/2017)**

SURVEY INTERVALS (closed systems)			
<b>Oil Lubricated</b>			
	Flanged Propeller Coupling	Keyless Propeller Coupling	Keyed Propeller Coupling (3)
Every five years (1)	Method 1 or Method 2 or Method 3	Method 1 or Method 2 or Method 3 (4)	Method 1 or Method 2
Extension 2,5 Y	Yes (5)	Yes (5)	Yes (5)
Extension 1 Y	Yes (6)	Yes (6)	Yes (6)
Extension 3 M	Yes (7)	Yes (7)	Yes (7)
<b>Closed Loop System Fresh Water Lubricated</b>			
	Flanged Propeller Coupling	Keyless Propeller Coupling	Keyed Propeller Coupling (3)
Every five years	Method 1 (8) or Method 2 or Method 3	Method 1 (8) or Method 2 or Method 3 (4)	Method 1 (8) or Method 2
Extension 2,5 Y	Yes (5)	Yes (5)	Yes (5)
Extension 1 Y	Yes (6)	Yes (6)	Yes (6)
Extension 3 M	Yes (7)	Yes (7)	Yes (7)
<p>General notes:</p> <p>For surveys (Method 1, Method 2 or Method 3) completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date. The extension survey should normally be carried out within 1 month of the shaft survey due date. The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date the extension survey was completed.</p> <p>Notes:</p> <p>(1) unless an Extension type (Extension 2,5 Y, Extension 1 Y, Extension 3 M) is applied in between.</p> <p>(2) only one Extension type can be applied in between two Methods (Extension 2,5 Y or Extension 1 Y) except for what concerns the Extension 3 M (see further note g).</p> <p>(3) Method 3 is not allowed.</p> <p>(4) maximum of two consecutive Method 3 surveys. The maximum interval between two surveys carried out according to Method 1 or Method 2 is not to exceed 15 years, except in the case when one extension for no more than three months is granted.</p> <p>(5) no more than one extension can be granted. No further extension of other type can be granted.</p> <p>(6) no more than two consecutive extensions can be granted. No further extension of other type can be granted.</p> <p>(7) no more than one three month extension can be granted. In the event an additional extension is requested, the requirements of the one year extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of one year.</p> <p>(8) The maximum interval between two surveys carried out according to Method 1 is not to be more than 15 years.</p>			

#### 8.2.4 Water Lubricated Shafts (open loop systems) (refer also to Table 3) (1/1/2017)

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

- a) Configurations allowing 5 year intervals
  - 1) Single shaft operating exclusively in fresh water.
  - 2) Single shaft provided with adequate means of corrosion protection, single corrosion resistant shaft.
  - 3) All kinds of multiple shaft arrangements.
- b) Other systems (3 year intervals)

Shaft not belonging to one of the configurations listed in [8.2.4]a) is to be surveyed according to Method 4 every 3 years.

For keyless propeller connections, the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (NDE) is not to exceed 15 years.

#### c) Survey extensions

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

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

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

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

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

**Table 3 : Survey Intervals (open systems) (1/1/2017)**

SURVEY INTERVALS (open systems)			
<ul style="list-style-type: none"> <li>Single Shaft operating exclusively in fresh water</li> <li>Single Shaft provided with adequate means of corrosion protection, Single corrosion resistant shaft</li> <li>All kinds of multiple shaft arrangements</li> </ul>		Other shaft configuration.	
All kinds of Propeller Coupling (4)		All kinds of Propeller Coupling (4)	
Every five years (4)	Method 4	Every three years (1)	Method 4
Extension 1 Y	Yes (2)	Extension 1 Y	Yes (2)
Extension 3 M	Yes (3)	Extension 3 M	Yes (3)
<p>General notes:</p> <p>For surveys (Method 4) completed within 3 months before the shaft survey due date, the next period will start from the shaft survey due date.</p> <p>The extension survey should normally be carried out within 1 month of the shaft survey due date and the extension counts from the shaft survey due date. If the extension survey is carried out more than 1 month prior to the shaft survey due date, then the period of extension counts from the date the extension survey was completed.</p> <p>Notes:</p> <p>(1) unless an Extension type (Extension 1 Y, Extension 3 M) is applied in between</p> <p>(2) no more than one extension can be granted. No further extension, of other type, can be granted</p> <p>(3) no more than one extension can be granted. In the event an additional extension is requested, the requirements of the one year extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of one year</p> <p>(4) for keyless propeller connections, the maximum interval between two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (NDE) is not to exceed 15 years.</p>			

### 8.3 Shaft complete survey

#### 8.3.1

Tailshafts are to be submitted to complete examination at the periodicity specified below and summarised in Fig 1, based on the type of shaft and its design, but with a maximum interval between successive examinations not exceeding the periodicity according to items a), b) and c) below by more than six months. Consideration may be given at the discretion of the Society to any special circumstances justifying an extension of these intervals.

- a) Where the tailshaft is fitted with continuous liners, or approved oil sealing glands, or made of corrosion-resistant material, the periodicity of complete surveys is:
  - 3 years for single shafting arrangements
  - 4 years for multi-shafting arrangements.
- b) These periodicities may be increased to 5 years in the following cases:
  - where the propeller is fitted keyless to the shaft taper, the shaft is protected from sea water, the

design details are approved, and a non-destructive examination of the forward part of the aft shaft taper is performed at each survey by an approved crack-detection method

- where the propeller is fitted to a keyed shaft taper the design details of which comply with the applicable requirements in Pt C, Ch 1, Sec 7, 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 of about one third of the length of the taper from the large end is performed at each survey by an approved crack-detection method
  - where the propeller is fitted to a solid flange coupling at the aft end of the shaft, the shaft and its fittings are not exposed to corrosion, the design details are approved, and a non-destructive examination of the after flange fillet area of the shaft is performed at each survey by an approved crack-detection method
- c) In all other cases the periodicity of complete surveys is two years and six months (2,5 years).

## 8.4 Shaft modified survey

### 8.4.1

A modified survey of the tailshaft is an alternate way of examination whose scope is given in Ch 3, Sec 5. It may be accepted at alternate five-yearly surveys for tailshafts described in [8.3.1] provided that:

- they are fitted with oil lubricated bearings and approved oil sealing glands
- the shaft and its fittings are not exposed to corrosion
- the design details are approved
- the clearances of the aft bearing are found to be in order
- the oil and the oil sealing arrangements prove effective
- lubricating oil analyses are carried out regularly at intervals not exceeding six months and oil consumption is recorded at the same intervals.

## 8.5 Tailshaft Monitoring System (MON-SHAFT)

### 8.5.1

Where, in addition to the conditions stated in [8.4.1] for modified survey, the additional class notation **MON-SHAFT** or **MON-SHAFT-WATER** is assigned, the tailshaft need not be withdrawn at both the complete and modified survey provided that all condition monitoring data is found to be within permissible limits and the remaining requirements for the respective surveys are complied with.

## 8.6 Other propulsion systems

### 8.6.1

Driving components serving the same purpose as the tailshaft in other propulsion systems, such as directional propellers, vertical axis propellers, water jet units, dynamic positioning systems and thruster assisted mooring systems, are to be submitted to periodical surveys at intervals not exceeding five years.

## 9 Boiler survey

### 9.1

#### 9.1.1

For the boiler survey reference is to be made to the Rules for the Classification of Ships.

## 10 Links between anniversary dates and annual surveys, intermediate surveys and class renewal surveys

### 10.1

**10.1.1** The link between the anniversary dates, the class renewal survey (when carried out according to the normal

system), and the annual and intermediate surveys is given in Fig 4.

## 11 Occasional surveys

### 11.1 General

**11.1.1** An occasional survey is any survey which is not a periodical survey. The survey may be defined as an occasional survey of hull, machinery, boilers, refrigerating plants, etc., depending on the part of the ship concerned.

Where defects are found, the Surveyor may extend the scope of the survey as deemed necessary.

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

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

### 11.2 Damage and repair surveys

**11.2.1** All available information regarding the damages to hull, machinery or other equipment, which affect or may affect the class, and the relevant repair works are to be noted in the ship's log and submitted to the attending Surveyor when he boards the ship for use in determining further survey requirements.

Note 1: Whenever a ship is fitted with an helicopter platform which is made in aluminium or other low melting metal construction which is not made equivalent to steel, and a fire occurred on the said platform or in close proximity, the platform is to be subject to a structural survey to determine its suitability for further use.

**11.2.2** All repairs to hull, machinery and equipment which may be required in order for a ship to retain its class are to be to the satisfaction of the Surveyor.

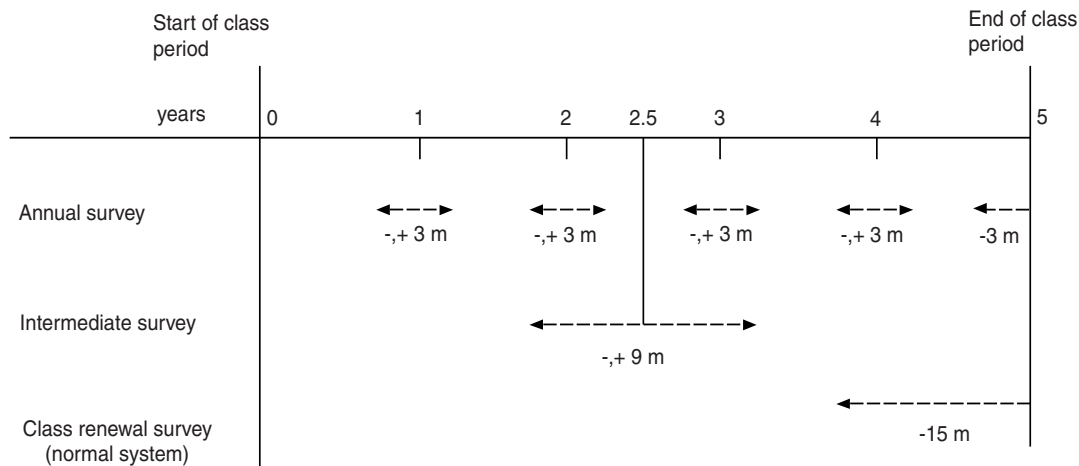
During repairs or maintenance work, the Owner is to arrange so that any damage, defects or non-compliance with the rule requirements are reported to the Surveyor when he boards the ship.

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

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



Figure 4 : Links between anniversary date and annual, intermediate and class renewal surveys



### 11.3 Conversions, alterations and repairs

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

**11.3.2** Materials and equipment used for conversions, alterations or repairs are generally to meet the requirements of the Rules for new ships built under survey; see Sec 1, [2.1.5].

## 12 Change of ownership

### 12.1

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

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

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

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

## 13 Lay-up and re-commissioning

### 13.1 General principles

#### 13.1.1

A ship put out of commission may be subject to specific requirements for maintenance of class, as specified below, provided that the Owner notifies the Society of the fact.

If the Owner does not notify the Society of the laying-up of the ship or does not implement the lay-up maintenance program, the ship's class after agreement with the Owner, may be suspended and/or withdrawn when the due surveys are not carried out by their limit dates in accordance with the applicable requirements given in [14].

**13.1.2** The lay-up maintenance program provides for a "laying-up survey" to be performed at the beginning of lay-up and subsequent "annual lay-up condition surveys" to be performed in lieu of the normal annual surveys which are no longer required to be carried out as long as the ship remains laid-up. The minimum content of the lay-up maintenance program as well as the scope of these surveys are given in Ch 3, App 1. The other periodical surveys which become overdue during the lay-up period may be postponed until the re-commissioning of the ship.

**13.1.3** Where the ship has an approved lay-up maintenance program and its period of class expires, the period of class is extended until it is re-commissioned, subject to the satisfactory completion of the annual lay-up condition surveys as described in [13.1.2].

**13.1.4** The periodical surveys carried out during the lay-up period may be credited, either wholly or in part, at the discretion of the Society, having particular regard to their extent and dates. These surveys will be taken into account for the determination of the extent of surveys required for the re-commissioning of the ship and/or the expiry dates of the next periodical surveys of the same type.

**13.1.5 (1/1/2017)**

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

- an occasional survey prior to re-commissioning, the scope of which depends on the duration of the lay-up period
- all periodical surveys which have been postponed in accordance with [13.1.2], taking into account the provisions of [13.1.4]. In all cases where the Owner elects to carry out the "next due" renewal survey, the due periodical hull and machinery surveys will be replaced by this one, Class period will be assigned in accordance with the provisions of [4.1.3].

**13.1.6** Where the previous period of class expired before the re-commissioning and was extended as stated in [13.1.3], in addition to the provisions of [13.1.5] a complete class renewal survey is to be carried out prior to re-commissioning. Those items which have been surveyed in compliance with the class renewal survey requirements during the 15 months preceding the re-commissioning may be credited. A new period of class is assigned from the completion of this class renewal survey.

**13.1.7** The principles of intervals or limit dates for surveys to be carried out during the lay-up period, as stated in [13.1.1] to [13.1.6], are summarised in Fig 5.

**13.1.8** The scope of the laying-up survey and annual lay-up condition surveys are described in detail in Ch 3, App 1.

## 14 Suspension and withdrawal of Class

### 14.1 Discontinuance of class

#### 14.1.1

The class may be discontinued either temporarily or permanently. In the former case it is referred to as "suspension" of class, in the latter case as "withdrawal" of class. In both these cases, the class is invalidated in all respects.

#### 14.1.2

The class may be suspended following the decision of the Society and after agreement with the Owner, when one or more requirements of the present Section 2 are not dealt with.

#### 14.1.3

The Society will withdraw the class of a ship in the following cases:

- at the request of the Owner
- when the causes that have given rise to a suspension currently in effect have not been removed within six months of the date of the notification of the suspension to the Owner. However, the Society may withdraw the class of the ship before the end of the six-month period where it deems it appropriate. A longer suspension may be granted at the Society's discretion when the ship is not trading as in cases of lay-up, awaiting disposition in the case of a casualty or attendance for reinstatement.
- when the ship is reported as a constructive total loss
- when the ship is lost
- when the ship is reported scrapped.

Withdrawal of class takes effect from the date on which the circumstances causing such withdrawal occur.

#### 14.1.4

When the withdrawal of class of a ship comes into effect, the Society will forward the Owner written notice and will inform the Naval Authority, if different from the Owner.

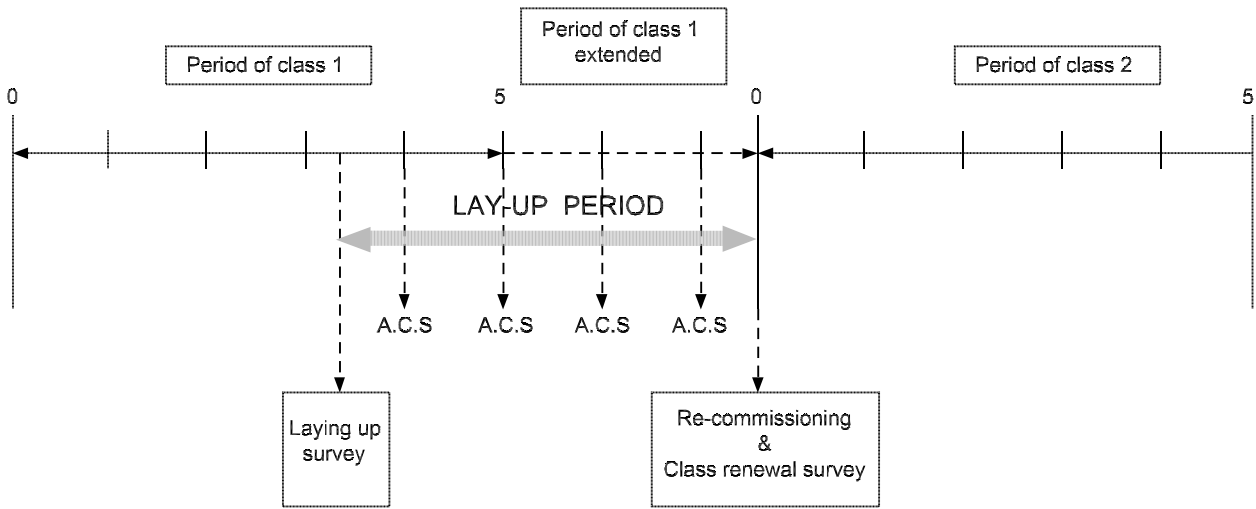
#### 14.1.5

The same procedure indicated in the above paragraphs may apply for suspension or withdrawal of service notations (where a ship is assigned with more than one service notation) and additional class notations. The suspension or withdrawal of an additional class notation or a service notation (where a ship is assigned with more than one service notation) generally does not affect the class.

#### 14.1.6

When an agreement for the accreditation of surveys carried out by the Owner is installed in compliance with [1.6], the procedures for suspension or withdrawal will be governed by the mentioned agreement.

Figure 5 : Survey scheme of a case of a lay-up going beyond the expiry date of the period of class



Note 1: A. C. S. means annual lay-up condition survey.

# APPENDIX 1

# REGULATORY FRAMEWORK

## 1 General

### 1.1 Regulatory Framework

#### 1.1.1

For the purpose of the definition of the “Regulatory Framework” of a new ship, the form to be filled, as requested in Sec 1, [2.3.4] is provided hereafter.

#### 1.1.2

The form provided hereafter is to be considered as a first issue; at the time of classification request, the Shipyard is to ask the Society to provide the review in force of the “Regulatory Framework” form.



**REGULATORY FRAMEWORK  
FOR THE PURPOSE OF THE CLASSIFICATION OF NAVAL SHIP**

The undersigned Company \_\_\_\_\_, being the Shipyard assigned with the construction of the hull described below (hereinafter "the Ship"), hereby requests the classification of the Hull in accordance with the Tasneef Rules for the Classification of Naval Ships.

**1) SHIP'S DATA**

Shipyard \_\_\_\_\_ Hull no. \_\_\_\_\_

We request the above mentioned ship to be named \_\_\_\_\_

Owner \_\_\_\_\_ Date of contract between owner and shipyard \_\_\_\_\_

Sister ships/RI (not relevant to the above contract) \_\_\_\_\_

Sister ships (relevant to the above contract) \_\_\_\_\_

Lbp (m): \_\_\_\_\_ B (m): \_\_\_\_\_ D (m): \_\_\_\_\_ Draught scantling (m): \_\_\_\_\_

Gross Tonnage (expected) (GT) \_\_\_\_\_ Net Tonnage (expected) (NT) \_\_\_\_\_

Displacement expected (t) \_\_\_\_\_ Hull material \_\_\_\_\_

Date of Keel Laid (expected) \_\_\_\_\_ Date of delivery (expected) \_\_\_\_\_

Type and number of propulsion engines \_\_\_\_\_ Engine output (kW) \_\_\_\_\_

Number and type of propulsion system \_\_\_\_\_ Output of each electric generator, emergency included (kW) \_\_\_\_\_

Maximum speed (kts) \_\_\_\_\_ Cruise speed (kts) \_\_\_\_\_

Total fuel capacity (m<sup>3</sup>) \_\_\_\_\_ Endurance (NM) \_\_\_\_\_

Embarked personnel (maximum total): _____	Crew: _____
	Embarked forces: _____
	Special personnel: _____
	Wounded personnel allowance: _____
	Passenger and other embarked persons: _____
	Persons carried in an emergency: _____





## 3) APPLICABLE STANDARDS

Item	Ref.	Requirement	Value
1.	Pt B, Ch 3, Sec 2	Intact stability	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
2.	Pt B, Ch 3, Sec 3	Damage stability	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
3.	Pt B, Ch 3, Sec 4	Sea-keeping in transit operation	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
4.	Pt B, Ch 5	Structural design loads	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
5.	Pt B, Ch 8, Sec 10	Helicopter deck scantling and arrangement	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
6.	Pt B, Ch 9, Sec 4	Equipment (anchors, chains and mooring)	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
7.	Pt C, Ch 1, Sec 1	General requirements for machinery	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
8.	Pt C, Ch 1, Sec 6	Gearing	in accordance with <input type="checkbox"/> Tasneef Naval ships <input type="checkbox"/> Navy Standards (see Notes)
9.	Pt C, Ch 1, Sec 7	Main propulsion shafting	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
10.	Pt C, Ch 1, Sec 10	Machinery systems	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)
11.	Pt C, Ch 1, Sec 11	Steering Gear	in accordance with <input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Navy Standards (see Notes)







## 4) DETAILED REQUIREMENTS

Item	Ref.	Requirement	Value
1	Pt B, Ch 1, Sec 2, [6.3.1]	Main deck position	<input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Other: .....
2	Pt B, Ch 1, Sec 2, [6.4.1]	Watertight deck (only for front line and second line ships)	<input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Not required
3	Pt B, Ch 3, Sec 2, [1.1.3]	Loading instrument	<input type="checkbox"/> Required <input type="checkbox"/> Not required
4	Pt B, Ch 3, Sec 2, [2.1.4]	Ship mass evolution	<input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Other: .....
5	Pt B, Ch 3, Sec 4	Limiting sea state in transit operation	<input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Other: .....
6	Pt B, Ch 3, Sec 4	Speed for sea-keeping in transit operation	<input type="checkbox"/> Cruise speed = ..... kts <input type="checkbox"/> Other = ..... kts
7	Pt B, Ch 5, Sec 1, [2.1.1]	Ship design life	<input type="checkbox"/> Tasneef Naval Ships (30 years) <input type="checkbox"/> Other = ..... years
8	Pt B, Ch 8, Sec 10, [5.5.1]	Allowable permanent set coefficient for FEM calculation of plating of helicopter deck, if applicable	<input type="checkbox"/> Not Applicable <input type="checkbox"/> $C_0 =$ .....
9	Pt C, Ch 1, Sec 1, Tab 2	Air temperature in enclosed spaces	<input type="checkbox"/> Tasneef Naval Ships <input type="checkbox"/> Other: MIN: ..... °C MAX: ..... °C
10	Pt C, Ch 1, Sec 1, [3.6]	External air temperature for machinery space ventilation calculation	<input type="checkbox"/> Tasneef Naval Ship <input type="checkbox"/> Other: ..... °C
11	Pt C, Ch 1, Sec 10, [2.1.3]	Use of plastic pipes	<input type="checkbox"/> admitted <input type="checkbox"/> not admitted
12	Pt C, Ch 1, Sec 10, [7.2.2]	Required capacity of each ballast pump (if any)	$Q_{min} =$ .....m <sup>3</sup> /h
13	Pt C, Ch 1, Sec 10, [11.9.2]	Required capacity of each JP5-NATO (F44) service tanks (if any)	$V_{min} =$ ..... m <sup>3</sup>
14	Pt C, Ch 2, Sec 3, [3.5]	Pay load to be supplied under emergency generation	<input type="checkbox"/> No pay load to be supplied <input type="checkbox"/> Equipments to be supplied are listed in "Notes"





**5) SIGNATURE**

**For the Shipyard:**

Signed	
Name	
Position	
Address	
Date of Signature	

Official Seal

**6) APPROVALS**

**For the Naval Administration:**

Signed	
Name	
Position	
Address	
Date of Signature	

Official Seal

**For Tasneef:**

Signed	
Name	
Position	
Address	
Date of Signature	

Official Seal

## APPENDIX 2

# THICKNESS MEASUREMENTS: EXTENT, DETERMINATION OF LOCATIONS, ACCEPTANCE CRITERIA

### 1 General

#### 1.1 Aim of the Appendix

**1.1.1** Thickness measurements are a major part of surveys to be carried out for the maintenance of class, and the analysis of these measurements is a prominent factor in the determination and extent of the repairs and renewals of the ship's structure.

**1.1.2** The Appendix is intended to provide Owners, companies performing thickness measurements and the Society's Surveyors with a uniform means with a view to fulfilling Rule requirements for thickness measurements. In particular, it will enable all the above-mentioned parties to carry out:

- the planning and preparation
- the determination of extent and location, and
- the analysis

of the thickness measurements in cooperation.

**1.1.3** This Appendix is also to be used for the thickness measurements of ships assigned the notation **STAR-HULL** (see Ch 5, Sec 3 and Part F, Chapter 2 of the Rules for the Classification of the Ships). However, the acceptance criteria for thickness measurements specific to this notation are given in Pt F, Ch 2, Sec 1 of the Rules for the Classification of the Ships.

#### 1.2 Scope of the Appendix

**1.2.1** Separate Articles below provide the following information:

- references to rule requirements and some additional information on the extent of the thickness measurements to be performed during surveys (see [2])
- locations of the measurements for the main parts of the ship (see [3])
- how to analyse the results of thickness measurements (see [4]).

### 2 Rule requirements for the extent of measurements

#### 2.1 General

**2.1.1** For the maintenance of class, thickness measurements may be required during annual, intermediate and class renewal surveys.

Tab 1 gives the references to the requirements for minimum thickness measurements related to the different types of surveys.

Some additional explanations are also given about the general principles of the required thickness measurements during class renewal surveys.

#### 2.2 Class renewal survey

**2.2.1** The thickness measurements required by the Rules consist of:

- systematic thickness measurements, i.e. measurements of different parts of the structure in order to assess the overall and local strength of the ship
- measurements of suspect areas as defined in Sec 2, [2.2.9]
- additional measurements on areas determined as affected by substantial corrosion as defined in Sec 2, [2.2.8].

### 3 Number and locations of measurements

#### 3.1 General

**3.1.1** Considering the extent of thickness measurements as required by the Rules and indicated in [2] above, the locations of the points to be measured are given here for the most important items of the structure. Thus the number of points can be estimated.

**Table 1 : References to rule requirements related to thickness measurements**

TYPE OF SURVEY		
CLASS RENEWAL	INTERMEDIATE	ANNUAL
Ch 3, Sec 3, [2.5] and Ch 3, Sec 3, Tab 2 : systematic measurements and suspect areas Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 3, Sec 3, Tab 3 as guidance	Ch 3, Sec 2, Tab 1 : thickness measurements to be taken if deemed necessary by the Surveyor Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 3, Sec 3, Tab 3 as guidance	Ch 3, Sec 1, [2.2.2] : areas of substantial corrosion identified at previous surveys Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 3, Sec 3, Tab 3 as guidance

### 3.2 Locations of points

**3.2.1** Tab 2 provides explanations and/or interpretations for the application of those requirements indicated in the Rules which refer to systematic thickness measurements.

## 4 Acceptance criteria for thickness measurements

### 4.1 General

**4.1.1** Acceptance criteria stipulate limits of wastage which are to be taken into account for reinforcements, repairs or renewals of steel structure. These limits are generally expressed for each structural item as a maximum percent-

age of acceptable wastage (W). When the maximum percentage of wastage is indicated, the renewal thickness  $t_{ren}$  (minimum acceptable thickness) is that resulting from applying this percentage to the rule thickness ( $t_{rule}$ ), according to the following formula:

$$t_{min} = \left(1 - \frac{W}{100}\right) t_{rule}$$

However, when the rule thickness is not available, the as-built thickness can be used.

Only for criteria related to an item (see [4.3.3] b), the Society may establish a list of renewal thicknesses tailored to the different structural items. In such a case these thicknesses are used in lieu of the minimum thicknesses calculated from the percentage of wastage.

**Table 2 : Interpretations of rule requirements for the locations and number of points to be measured**

SYSTEMATIC MEASUREMENTS	
ITEM	INTERPRETATION
Selected plates on deck, inner bottom, double bottom and wind-and-water region	"Selected" means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion
All deck, inner bottom and bottom plates and wind-and-water strakes	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
Transverse section	Refer to the definition given in Sec 2, [2.2.5]
Bulkheads	"Selected bulkheads" means at least 50% of the bulkheads
Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, 'tweendecks, girders	The internal structural items to be measured in each space internally surveyed are to be at least 20% within the central part of the ship and 10% in the remaining parts

**Note 1:** The central part of the ship is defined in Pt B, Ch 1, Sec 1, [2.1].

**4.1.2** In cases where the ship has some structural elements with reduced wear margins (e.g. due to ship conversion), the renewal thickness (minimum acceptable thickness) for these elements is to be calculated with reference to the rule scantlings without taking account of any reduction originally agreed.

**4.1.3** Decisions on steel renewals are taken by the attending Surveyor applying the criteria given in this Article and based on his judgment and the actual condition of the ship. Should advice be needed to support his decision, the Surveyor may refer to the relevant technical office of the Society.

### 4.2 Criteria

**4.2.1** The acceptance criteria for the minimum thicknesses are divided into:

- criteria on local and global strength, given in [4.3]
- criteria on buckling strength, given in [4.4]
- criteria on pitting, given in [4.5].

**4.2.2** Each measured structural item is to be checked against the following criteria, as far as applicable. Where any of the criteria are not met, reinforcements, repairs and renewals are to be carried out as appropriate.

### 4.3 Local and global strength criteria

**4.3.1** For the evaluation of the ship longitudinal strength, it is a prerequisite that fillet welding between longitudinal members and deck, side and bottom plating is maintained effective so as to keep continuity of hull structures.

**4.3.2** These structural items are also listed in a table (see Tab 5) grouped according to their position and contribution to the local or global strength of the ship.

**4.3.3** Each structural item is to be assessed according to four different criteria which vary with regard to the domain under which it is considered, namely:

- a) an isolated area, which is meant as a part of a single structural item. This criterion takes into consideration very local aspects such as grooving of a plate or web, or local severe corrosion; however, it is not to be used for pitting for which separate criteria are considered (see [4.5])
- b) an item, which is meant as an individual element such as a plate, a stiffener, a web, etc. This criterion takes into consideration the average condition of the item, which is assessed by determining its average thickness using the various measurements taken on the same item
- c) a group of items, which is meant as a set of elements of the same nature (plates, longitudinals, girders) contributing either to the longitudinal global strength of the ship in a given zone or to the global strength of other

primary transverse elements not contributing to the ship longitudinal strength, e. g. bulkheads, hatch covers, web frames

- d) a zone, which is meant as all and only longitudinal elements contributing to the longitudinal strength of the ship; in this regard, the three main zones are defined as deck zone, neutral axis zone and bottom zone. This criterion takes into consideration the average condition of all groups of items belonging to the same zone.

**4.3.4** The assessment of the thickness measurements is to be performed using the values given in the table for each structural element with regard to the criteria defined above, in the following order:

- a) assessment of isolated areas (column 1 in the table). If the criterion is not met, the wasted part of the item is to be dealt with as necessary.
- b) assessment of items (column 2 in the table). If the criterion is not met, the item is to be dealt with as necessary in the measured areas as far as the average condition of the item concerned is satisfactory. In cases where some items are renewed, the average thicknesses of these items to be considered in the next step are the new thicknesses.
- c) assessment of groups of items (column 3 in the table). If the criterion is not met, a sufficient number of elements are to be renewed in order to obtain an increased average thickness satisfying the considered criterion of the group (generally the elements to be renewed are those most wasted). As an example, for the assessment of the group "deck plates" all deck plates are measured and an average thickness of each of them is estimated. Then the average of all these values is to satisfy the criteria given for this group.
- d) assessment of zones (column 4 in the table). In principle, the criterion of the zone is met when all groups of items belonging to the zone meet their own criteria (see c) above). However, a greater diminution than those given in column 3 may be accepted for one group of items if, considering the other groups of items belonging

to the same zone, the overall diminution of the zone does not exceed the criterion given for it in column 4.

Example: The deck zone consists of two groups of items:

- deck plating, which has an average diminution of 12% (criterion 10%)
- deck longitudinals, which has an average diminution of 4% (criterion 10%)

Even though the deck plating group exceeds its acceptance criterion, the average diminution of the zone, which can be very roughly estimated at 8%, is acceptable and thus the deck plating group can be accepted as it is.

Note 1: This criterion applicable to the zones is based on the general rule that the current hull girder section modulus is not to be less than 90% of the rule section modulus within 0,4L amidships. When the zone criterion is used, the assessment is made on the basis of the original modulus instead of the rule modulus. At the request of the Owner, a direct calculation using the ship's current thicknesses may be performed by the Society in order to accept greater diminutions than those given for this criterion.

**4.3.5** These criteria take into consideration two main aspects:

- the overall strength of the hull girder
- the local strength and integrity of the hull structure, such as hatch covers, bulkheads, etc.

As a rule, they are applicable to the structure within the central part of ships having a length greater than 90 metres. However, they may also be used for smaller ships and for structure outside the central part according to the following principles:

- for ships having a length less than 90 metres, the percentages of acceptable wastage given in the tables can be increased by 5 (%) (e.g. 15% instead of 10%, etc.), except for those of deck and bottom zones
- for structure outside the central part, the same 5 (%) increase can be applied

on the understanding, however, that both conditions cannot be applied at the same time.

**Table 3 : Buckling strength criterion**

ITEMS		RATIO	MATERIAL ( $R_{eH}$ )		
			235	315	355 and 390
Bottom and deck plates		$s / t$	56,0	51,0	49,0
Longitudinals	flat bar web	$h_w / t_w$	20,0	18,0	17,5
Flanged longitudinals / girders	web	$h_w / t_w$	56,0	51,0	49,0
Flanged longitudinals / girders	symmetrical flange	$b_f / t_f$	34,0	30,0	29,0
Flanged longitudinals / girders	asymmetrical flange	$b_f / t_f$	17,0	15,0	14,5
Symbols:					
$R_{eH}$ : minimum yield stress of the material, in N/mm <sup>2</sup> ;		$s$ : longitudinal spacing, in mm;	$t$ : actual plate thickness, in mm;		
$h_w$ : web height, in mm; $t_w$ : web thickness, in mm;		$b_f$ : flange breadth, in mm;	$t_f$ : flange thickness, in mm;		

#### 4.4 Buckling strength criterion

**4.4.1** In addition to the evaluation of structural elements according to [4.3] above, the structural items contributing to the longitudinal strength of the ship, such as deck and bottom plating, deck and bottom girders, etc., are also to be assessed with regard to their buckling strength. The values shown in Tab 4 are not to be exceeded.

Note 1: The minimum thickness will be specially considered for ships built with excess hull girder section modulus.

#### 4.5 Pitting

**4.5.1** The maximum acceptable depth for isolated pits is 35% of the as-built thickness.

**4.5.2** For areas with different pitting intensity, the intensity diagrams shown in Fig 1 are to be used to identify the percentage of affected areas.

For areas having a pitting intensity of 50% or more, the maximum acceptable average depth of pits is 20% of the as-built thickness. For intermediate values between isolated pits and 50% of affected area, the interpolation between 35% and 20% is made according to Tab 5.

**4.5.3** In addition, the thickness outside the pits in the area considered is to be assessed according to [4.3] and [4.4] above.

Note 1: Application of filler material (plastic or epoxy compounds) is recommended as a means to stop or reduce the corrosion pro-

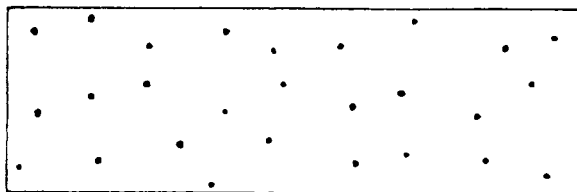
cess, but it is not considered an acceptable repair for pitting exceeding the maximum allowable wastage limits. Welding repairs may be accepted when performed in accordance with procedures agreed with the Society.

**Table 4 : Pitting intensity and corresponding maximum acceptable average depth of pitting**

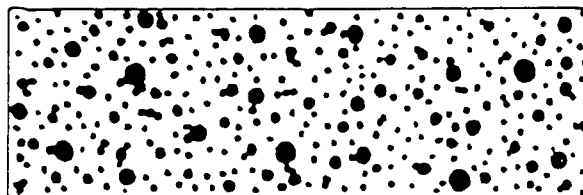
PITTING INTENSITY (%)	MAXIMUM ACCEPTABLE AVERAGE PITTING DEPTH (% of the as-built thickness)
Isolated	35,0
5	33,5
10	32,0
15	30,5
20	29,0
25	27,5
30	26,0
40	23,0
50	20,0

Figure 1 : Pitting intensity diagrams (from 1% to 50% intensity)

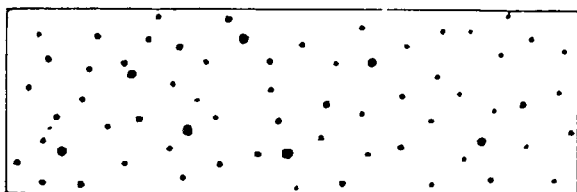
1% SCATTERED



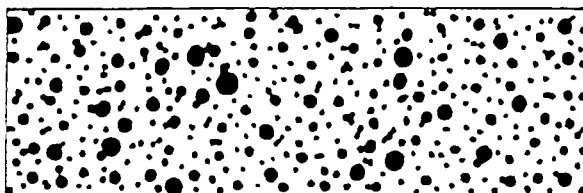
20% SCATTERED



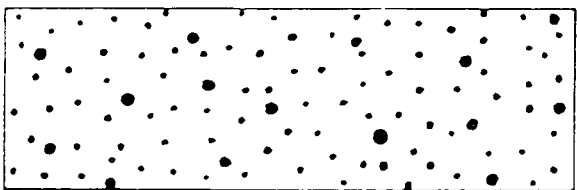
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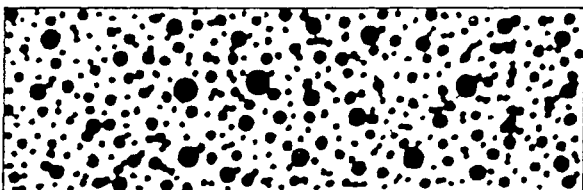
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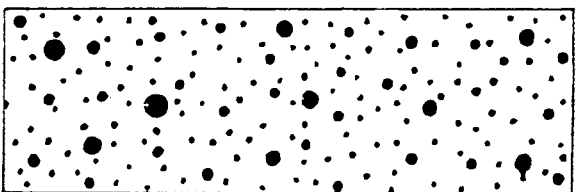
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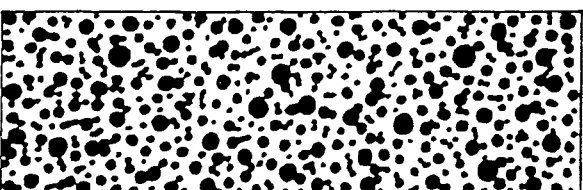
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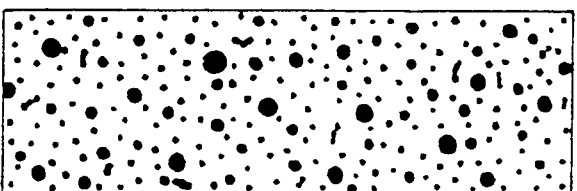
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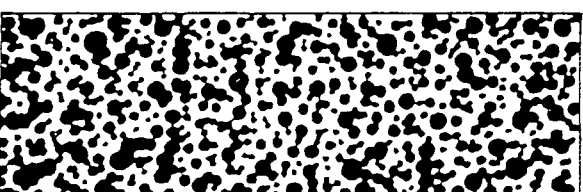
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**Table 5 : Local and global acceptance criteria (given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ITEMS CONTRIBUTING TO THE LONGITUDINAL STRENGTH (TRANSVERSE SECTION)</b>					
DECK ZONE (1)		-	-	-	10
1	Upperdeck plating, deck stringer plates and sheer strakes	30	20	10	-
2	Deck longitudinals	-	-	10	-
	web	30	20	-	-
	flange	25	15	-	-
3	Hatch coaming	-	-	10	-
	underdeck girder web	25	20	-	-
	underdeck girder flange	20	15	-	-
NEUTRAL AXIS ZONE (1)		-	-	-	15
4	Side shell plating	25	20	15	-
5	Tweendeck plating	30	20	15	-
6	Tweendeck longitudinals	-	-	15	-
	web	30	20	-	-
	flange	25	15	-	-
BOTTOM ZONE (1)		-	-	-	10
7	Bilge and bottom strakes and keel plate	25	20	10	-
8	Bottom girders	25	20	10	-
9	Bilge and bottom longitudinals	-	-	10	-
	web	30	20	-	-
	flange	25	15	-	-
10	Inner bottom plating	30	20	10	-
11	Inner bottom longitudinals	-	-	10	-
	web	30	20	-	-
	flange	25	15	-	-
<b>OTHER ITEMS</b>					
12	Transverse bulkheads (2)				
	plating	30	20	15	-
	stringer web	30	20	-	-
	stringer flange	25	15	-	-
	stiffener web	30	20	-	-
	stiffener flange	25	15	-	-
	brackets	30	20	-	-
13	Side frames				
	web	30	20	-	-
	flange	25	15	-	-
	brackets	30	20	-	-
14	Deck/tweendeck frames				
	web	30	20	-	-
	flange	25	15	-	-
15	Floors plating	30	20	-	-
<p>(1) Each zone is to be evaluated separately.</p> <p>(2) For deep tank bulkheads, the values "average of item" and "average of group" are to be increased by 5 (%).</p>					

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
16	Forward and aft peak bulkheads plating	30	20	15	-
	stiffener web	30	20	-	-
	stiffener flange	25	15	-	-
17	Hatch coaming plating	25	20	-	-
18	Hatch coaming brackets	30	25	-	-
19	Hatch cover top plating	25	20	15	-
20	Hatch cover skirt plating	30	20	-	-
21	Hatch cover stiffeners	30	20	-	-
<p>(1) Each zone is to be evaluated separately.</p> <p>(2) For deep tank bulkheads, the values "average of item" and "average of group" are to be increased by 5 (%).</p>					

Part A  
**Classification and Surveys**

Chapter 3

**SCOPE OF SURVEYS (all ships)**

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<b>SECTION 1</b>	<b>SURVEY FOR NEW CONSTRUCTION</b>
<b>SECTION 2</b>	<b>ANNUAL SURVEY</b>
<b>SECTION 3</b>	<b>INTERMEDIATE SURVEY</b>
<b>SECTION 4</b>	<b>CLASS RENEWAL SURVEY</b>
<b>SECTION 5</b>	<b>BOTTOM SURVEY</b>
<b>SECTION 6</b>	<b>SHAFT SURVEY</b>
<b>SECTION 7</b>	<b>BOILER SURVEY</b>
<b>APPENDIX 1</b>	<b>CLASS REQUIREMENTS AND SURVEYS OF LAID-UP SHIPS</b>

# SECTION 1

# SURVEY FOR NEW CONSTRUCTION

## 1 Hull

### 1.1 General

#### 1.1.1 Scope (1/1/2017)

The scope of this Article [1] includes the following main activities:

- a) Examination of the parts of the ship covered by classification Rules for hull construction, to obtain appropriate evidence that they have been built in compliance with the Rules and regulations, taking account of the relevant approved drawings.
- b) Appraisal of the manufacturing, construction, control and qualification procedures, including welding consumables, weld procedures, weld connections and assemblies, with indication of relevant approval tests.
- c) Witnessing inspections and tests as required in the classification Rules used for ship construction including materials, welding and assembling, with specification of the items to be examined and/or tested, the methods (e.g. by hydrostatic, hose or leak testing, non-destructive examination, verification of geometry) and who is to carry out such inspections and tests.

Appraisal of materials and equipment used for ship construction and their inspection at works is not included in this Article [1]. Details of requirements for hull and machinery steel forgings and castings and for normal and higher strength hull structural steel are given in the Rules for the Classification of Ships Pt D, Ch 2, Sec 3, Pt D, Ch 2, Sec 4 and Pt D, Ch 2, Sec 1, [2] respectively. Acceptance of these items is verified through the survey process carried out at the Manufacturer's works and the issuing of the appropriate certificates.

### 1.2 Definitions

#### 1.2.1 Hull structure (1/1/2017)

The hull structure (see Note 1) is defined as follows:

- a) hull envelope including all internal and external structures,
- b) superstructures, deckhouses and casings,
- c) welded foundations, e.g. main engine seatings,
- d) hatch coamings, bulwarks,

- e) all penetrations fitted and welded into bulkheads, decks and shell,
- f) the fittings of all connections to decks, bulkheads and shell, such as air pipes and ship side valves
- g) welded attachments to shell, decks and primary members, e.g. crane pedestals, bits and bollards, but only as regards their interaction on the hull structure.

Note 1: A glossary of hull terms and hull survey terms can be found in IACS Recommendation 82.

#### 1.2.2 Documents (1/1/2017)

Reference to documents also includes electronic transmission or storage.

#### 1.2.3 Survey methods (1/1/2017)

The survey methods which the Surveyor is directly involved in are as follows:

- a) Patrol is defined as the act of checking on an independent and unscheduled basis that the applicable processes, activities and associated documentation of the shipbuilding functions identified in Tab 1 continue to conform to classification and statutory requirements.
- b) Review is defined as the act of examining documents in order to determine traceability and identification, and to confirm that processes continue to conform to classification and statutory requirements.
- c) Witness is defined as the attendance at scheduled inspections in accordance with the agreed Inspection and Test Plans or equivalent to the extent necessary to check compliance with the survey requirements.

### 1.3 Application

#### 1.3.1 Classification items (1/1/2017)

This Article [1] covers the survey of all new construction of naval steel ships intended for classification and for international voyages.

#### 1.3.2 Statutory items (1/1/2017)

This Article [1] covers all delegated statutory items relevant to the hull structure and coating, i.e. Load Line and SOLAS or other Naval Standards, such as NATO ANEP 77 - Naval Ship Code.

### 1.3.3 Equipment, fittings and appendages (1/1/2017)

This Article [1] does not cover the manufacture of equipment, fittings and appendages regardless of whether they are made inside or outside the shipyard, examples being as follows:

- a) hatch covers,
- b) doors and ramps integral with the shell and bulkheads,
- c) rudders and rudder stock,
- d) all forgings and castings integral to the hull.

Evidence of acceptance is to be provided by accompanying documentation from the Surveyor at the Manufacturer's and verified at the shipyard.

### 1.3.4 Installation, welding and testing (1/1/2017)

This Article [1] applies to the installation in the ship, welding and testing of:

- a) the items listed in [1.3.3] above
- b) equipment forming part of the watertight and weather-tight integrity of the ship.

### 1.3.5 Location of construction (1/1/2017)

This Article [1] applies to the hull structures and coating constructed:

- a) at the shipbuilder's facilities,
- b) by subcontractors at the shipbuilder's facilities,
- c) by subcontractors at their own facilities or at other remote locations.

## 1.4 Personnel

### 1.4.1 Qualification and monitoring of exclusive Surveyors (1/1/2017)

The Society's Surveyors are to confirm through patrol, review and witness, as defined in [1.2.3], that ships are built using approved plans in accordance with the relevant Rules and statutory requirements. The Surveyors are to be qualified to be able to carry out their tasks, and procedures are to be in place to ensure that their activities are monitored.

## 1.5 Survey of the hull structure

### 1.5.1 Surveyable items (1/1/2017)

Tab 1 provides a list of surveyable items for the hull structure and coating covered by this Article [1], including:

- a) description of the shipbuilding functions;
- b) classification and statutory survey requirements;
- c) survey method required for classification;
- d) relevant Society Rule and statutory requirement references;
- e) documentation to be available for the Surveyor during construction. The shipbuilder is to provide the Surveyors with access to documentation required by the Society; this includes documentation retained by the shipbuilder or other third parties. The list of documents approved or

reviewed by the Society for the specific new construction is as follows:

- 1) plans and supporting documents,
  - 2) examination and testing plans,
  - 3) NDE plans,
  - 4) welding consumable details,
  - 5) welding procedure specifications,
  - 6) welding plan or details,
  - 7) welders' qualification records,
  - 8) NDE operators' qualification records;
- f) documents to be inserted into the ship construction file. Refer to [1.10] for details;
  - g) a list of specific activities which are relevant to the shipbuilding functions. This list is not exhaustive and can be modified to reflect the construction facilities or specific ship type.

### 1.5.2 Materials and equipment supplied (1/1/2017)

During the construction process as required, evidence is also to be made available by the shipbuilder to the Surveyor to prove that the materials and equipment supplied to the ship have been built or manufactured under survey relevant to the classification Rules requirements.

## 1.6 Review of the shipyard

### 1.6.1 Review of the construction facilities (1/1/2017)

The Society is to familiarise itself with the yard's production facilities, management processes and safety for consideration in terms of compliance with the requirements of Tab 1 (see Note 1) prior to any steelwork or construction taking place in the following circumstances:

- a) where the Society has no, or no recent, experience of the construction facilities - typically after a one year lapse - or when significant new infrastructure has been added,
- b) where there has been significant management or personnel restructuring having an impact on the ship construction process, or
- c) where the shipbuilder contracts to construct a ship of a different type or substantially different in design.

Note 1: Reference is made to [1.11] - Shipyard review record, as an example.

## 1.7 Newbuilding survey planning

### 1.7.1 Kick-off meeting (1/1/2017)

Prior to commencement of surveys for any newbuilding project, the Society is to discuss with the shipbuilder at a kick-off meeting the items listed in Tab 1. The purpose of the meeting is to review and agree how the list of specific activities shown in Tab 1 is to be addressed. The meeting is to take into account the shipbuilder's construction facilities and ship type, including the list of proposed subcontractors. A record of the meeting is to be made, based on the contents of Tab 1. Tab 1 itself can be used as the record with comments made in the appropriate column. If the Society has appointed a Surveyor for a specific newbuilding project then this Surveyor is to attend the kick-off meeting. The

builder should agree to undertake ad hoc investigations during construction as may be requested by Class where areas of concern arise and to keep the Society advised of the progress of any such investigation. Whenever an investigation is undertaken, the builder is to be requested, in principle, to agree to suspend relevant construction activities if warranted by the severity of the problem.

### **1.7.2 Construction progress records (1/1/2017)**

The shipyard shall be requested to advise of any changes to the activities agreed at the kick-off meeting and these are to be documented. For instance, if the shipbuilder chooses to use or change subcontractors, or to incorporate any modifications necessitated by changes in production or inspection methods, rules and regulations, structural modifications, or in the event where increased inspection requirements are deemed necessary as a result of a substantial non-conformance or otherwise.

### **1.7.3 Fabrication quality standard (1/1/2017)**

Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. Structural fabrication is to be carried out in accordance with IACS Recommendation 47, "Shipbuilding and Repair Quality Standard", or a recognised fabrication standard which has been accepted by the Society prior to the commencement of fabrication/construction. The work is to be carried out in accordance with the Rules and under survey of the Society.

### **1.7.4 Other attendees at the kick-off meeting (1/1/2017)**

The kick-off meeting may be attended by other parties, such as the Owner or Administrations, subject to agreement by the shipbuilder.

### **1.7.5 Special cases of kick-off meeting (1/1/2017)**

In the event of series ship production, consideration may be given to waiving the requirement for a kick-off meeting for the second and subsequent ships provided any changes are documented as required in [1.7.1].

## **1.8 Examination and test plan for newbuilding activities**

### **1.8.1 Plans to be provided (1/1/2017)**

The shipbuilder is to provide plans of the items which are intended to be examined and tested. These plans need not be submitted for approval and examination at the time of the kick-off meeting. They are to include:

- a) proposals for the examination of completed steelwork - generally referred to as the block plan and including

details of joining blocks together at the pre-erection and erection stages or at other relevant stages;

- b) proposals for fit-up examinations where necessary;
- c) proposals for testing of the structure (leak and hydrostatic) as well as for all watertight and weathertight closing appliances;
- d) proposals for non-destructive examination;
- e) any other proposals specific to the ship type or to the statutory requirements.

### **1.8.2 Submittal of plans to the Surveyors (1/7/2016)**

The plans and any modifications to them are to be submitted to the Surveyors in sufficient time to allow review before the relevant survey activity commences.

## **1.9 Proof of the consistency of surveys**

### **1.9.1 Evidence for survey planning and activities (1/1/2017)**

Inspection and test records, checklists etc are to be kept in order to provide evidence that the Society's Surveyors have complied with the requirements of the newbuilding survey planning and duly participated in the relevant activities shown in the shipbuilder's examination and test plans.

## **1.10 Ship Construction File**

### **1.10.1 Document provider (1/1/2017)**

The shipbuilder is to deliver documents for the Ship Construction File. In the event that items have been provided by another Party such as the Shipowner, and where separate arrangements have been made for document delivery excluding the shipbuilder, that Party has the responsibility.

The Ship Construction File is to be reviewed for content in accordance with the requirements of [1.10.2].

### **1.10.2 Contents of the Ship Construction File (1/1/2017)**

It is recognised that the purpose of documents held in the Ship Construction File on board the ship is to facilitate surveys and repairs and maintenance, and, therefore, in addition to those listed in Tab 1, such documents are to include, but not be limited to, the following:

- a) as-built structural drawings including scantling details, material details and, as applicable, wastage allowances, location of butts and seams, cross-section details and locations of all partial and full penetration welds, areas identified for close attention and rudders;
- b) manuals required for classification and statutory requirements, e.g. loading and stability, bow doors, inner doors, side shell doors and stern doors - opera-

tions and maintenance manuals ( Pt B, Ch 8, Sec 5 and Pt B, Ch 8, Sec 6);

- c) ship structure access manual, as applicable;
- d) copies of certificates of forgings and castings welded into the hull ( Pt D, Ch 2, Sec 3 and Pt D, Ch 2, Sec 4 of the Rules for the Classification of Ships);
- e) details of equipment forming part of the watertight and weathertight integrity of the ship;
- f) tank testing plan including details of the test requirements ( Pt B, Ch 11, Sec 3);
- g) corrosion protection specifications ( Pt B, Ch 10, Sec 1 and the Rules for the Classification of Ships Pt E, Ch 4, Sec 3, [11]);
- h) details for the in-water survey, if applicable, information for divers, clearance measurement instructions etc, tank and compartment boundaries;
- i) docking plan and details of all penetrations normally examined at dry-docking;
- j) Coating Technical File, for ships subject to compliance with the IMO Performance Standard for Protective Coat-

ings (PSPC), as a class requirement under the Common Structural Rules.

**1.11 Shipyard review record**

**1.11.1 Contents of the shipyard review record (1/1/2017)**

The shipyard review record is to contain the following information, for which the Society form "Shipyard review record" is to be filled in as appropriate:

- a) name and location of shipyard
- b) details of any management systems
- c) construction facilities
- d) shipyard control of qualified welders
- e) features of construction procedure
- f) quality control system
- g) measures for safety and health
- h) control system of non-destructive examination (NDE)
- i) quality control on production line.

**Table 1 : New construction survey activities (1/1/2017)**

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1	Welding:							
1.1	Welding consumables	Approved by Society separately at the Manufacturer's	Review approval status and patrol, verify storage, handling and treatment in accordance with Manufacturer's requirements	The Rules for the Classification of Ships Pt D, Ch 5, Sec 2	Consumable specification and approval status	Not required	Identify consumables against approved list	
							Verify temporary and permanent storage facilities	E.g. kept dry, covered, where applicable heated
							Verify traceability	E.g. random batch number checking

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1.2	Welder qualification	Qualified welders	Review of welder certification and patrol	Guide for Welding	Shipyards records with individual's identification	Not required	Verify welder qualification standard, e.g. class or recognised standard approval	
							Verify welder approved for weld position	
							Verify validity of qualification certificate	
1.3	Welding - mechanical properties (welding procedures)	All weld joint configurations, positions and materials to be covered by weld procedures approved by the Society or by another QSCS Classification Society available	Review and patrol	The Rules for the Classification of Ships Pt D, Ch 5, Sec 4	Approved weld procedure specification and welding plan relevant to the ship project or process	Not required	Verify procedures are available at relevant workstations	
		The Society witnesses all new weld procedure qualification tests carried out in the shipyard whenever the Society is surveying in the shipyard	Witness				Verify weld procedure records have been approved and cover all weld processes and positions in accordance with classification or recognised standards and are available for the Surveyor's reference	



No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1.3a	Welding equipment	Correctly calibrated and maintained	Patrol and review		Shipbuilder's maintenance and calibration records	Not required	Verify condition of machinery and equipment	
							Verify machines are calibrated by appropriate staff	
							Verify calibration carried out in accordance with Manufacturer's recommendations	
							Verify calibration in accordance with maintenance schedule	
1.3b	Welding environment	Satisfactory environment	Patrol	Guide for welding		Not required	Verify welding areas clean, dry, well lit	
							Confirm relevant measures taken for any pre- or post- heat treatment, drying of surfaces prior to welding	
							Confirm shielding gases, fluxes protected	
1.3c	Welding	Sufficient number of skilled supervisors	Review and Patrol	- Guide for welding - Rules for carrying out non-destructive examinations of welding			Verify supervision is effective	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1.4	Welding- surface discontinuities	Substantially free from significant indications, satisfactory profile and size	Visual examination, surface detection techniques, review of documents and patrol of operator	- Guide for welding - Rules for carrying out non-destructive examinations of welding	Shipbuilder's and recognised standards and Rules as applicable, welding and NDT plans, NDT reports, operator qualifications	Not required	Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure	
							Verify NDE carried out in accordance with approved plans where applicable	
							Verify suitability of NDE methods	
							Verify operators suitably qualified, particularly where sub-contractors have been employed	
							Verify NDE is carried out according to the acceptable process	
							Review NDE records	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1.5	Welding - embedded discontinuities	NDE is to be carried out by qualified operators capable of ensuring that welds are substantially free from significant indications	Radiography and ultrasonic testing, review of documents and patrol of operator, examination of films	- Guide for Welding - Rules for carrying out non-destructive examinations of welding	Shipbuilder's and recognised standards and Rules as applicable, welding and NDT plans, NDT reports, operator qualifications	Not required	Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure	
							Verify NDE carried out in accordance with approved plans, where applicable	
							Verify suitability of NDE methods	
							Verify operators suitably qualified, particularly where sub-contractors have been employed	
							Verify that records have been completed and in accordance with recognised standards, e.g. IQI and sensitivity recorded	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
1.5 Cont'd	Welding - embedded discontinuities						Verify that reports and radiographs have been evaluated correctly by the ship-builder. Systematic review of radiographs carried out by the Surveyor	
							Verify equipment calibration is satisfactory and in accordance with Manufacturer's and recognised standards and requirements	
							Verify NDE is carried out according to the acceptable process	
2	Steel preparation and fit up:							

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
2.1	Surface preparation, marking and cutting	Traceability and acceptability of material, check of steel plates and profiles, material type, scantling identification, testing marks	Patrol	Guide for welding	Material certificates, ship-builder's marking/cutting production documents at the work stage - documents retained at the facility	Not required	Verify stock-yard storage satisfactory	
							Verify material traceability, e.g. stamping identification against material certification, archiving of records	
							Verify transfer marking after treatment line	
							Verify standard of shot-blasting and priming	
							Verify suitability of primer	
							Verify that steel grades can be identified	
							Verify machinery is adjusted to stay within the Society's or Manufacturer's recommendations	
							Verify accuracy of marking and cutting	
							Verify storage of piece parts	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
2.2	Straightening	Maintain material properties. Acceptance of forming method against improper deformations	Patrol and review	Guide for welding	Recognised standards, approved procedures	Not required	Verify that straightening processes are approved for the grade and type of steel, e.g. thermo mechanical control process (tmcp), Z plate	
							Verify that plates and sections are within recognised tolerances	
2.3	Forming	Maintain material properties. Acceptance of forming method against improper deformations	Patrol	Guide for welding	Shipbuilder's procedure for hot forming	Not required	Verify that temperature control is exercised by the operator	
							Verify that suitable methods of temperature control are available when forming special steels and materials	
							Verify that forming processes are acceptable	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
2.4	Conformity with alignment/fit-up/gap criteria	Check alignment/fit-up/gap against reference standards	Patrol	Guide for welding	Shipbuilder's and recognised standards and Rules as applicable	Not required	Verify the processes to ensure satisfactory fit-up and alignment at all workstations	
							Verify that edge preparations are re-instated where lost during fitting operations	
							Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
2.5	Conformity for critical areas with alignment/fit-up or weld configuration	Check alignment/fit-up/gap against approved drawings	Patrol and review	Guide for welding	Shipbuilder's and recognised standards and Rules as applicable, approved plan or standard, builder's records	Approved plans of critical areas, if applicable	Verify that the information relevant to the latest approved drawings is available at the workstations	
							Verify the processes to ensure satisfactory fit-up and alignment at all workstations	
							Verify that edge preparations are re-instated where lost during fitting operations	
							Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	



No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
3	Steelwork process, e.g. sub-assembly, block, grand and mega block assembly, pre-erection and erection, closing plates	Compliance with approved drawings, visual examination of welding and material, check of alignment and deformations	Patrol of the process and witness of the completed item	Guide for welding	Approved plans, ship-builder's inspection records, ship-builder's and recognised standards and Rules as applicable, construction plan (steelwork sub-division)		Verify that the information relevant to the latest approved drawings is available at the workstations	
							Verify that correct weld sizes have been adopted	
							Verify operation of the welding processes at the different work stages is satisfactory	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
3 Cont'd	Steelwork process, e.g. sub-assembly, block, grand and mega block assembly, pre-erection and erection, closing plates						Verify that piece parts are identifiable	
							Verify that fit-ups are within recognised tolerances	
							Verify that correct welding requirements specified in reference 1 of this table have been adopted	
							Verify processes for closing plates are acceptable	
							Confirm that steelwork is in accordance with the approved plan	
4	Remedial work and alteration	Welding, check against deformation, alignment	Review records and witness	Guide for welding	Permanent record of shipyard surveyable item		Verify that records have been maintained of significant deviations from the approved plans, for situations such as mis-cut openings, re-routing outfit items	
							Verify that all deviations brought to the attention of the Society by the shipbuilder are acceptable	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
5	Tightness testing, including leak and hose testing, hydropneumatic testing	Absence of leaks	Review and witness of the test	Pt B, Ch 12, Sec 3	Approved tank testing plan, shipbuilder's inspection records	Approved tank testing plan	Confirm that tank testing is carried out in accordance with the approved plan	
							Confirm the methods used to carry out leak testing	
							Confirm that correct test pressures maintained for leak, hose and hydro and hydropneumatic testing are satisfactory	
							Verify that adequate records of the tank testing have been maintained	
6	Structural testing	Structural adequacy of the design	Review and witness testing	Pt B, Ch 12, Sec 3	Approved tank testing plan, shipbuilder's inspection records	Approved tank testing plan	Confirm that tank testing is carried out in accordance with the approved plan	
							Confirm that correct test pressures maintained for testing are satisfactory	
							Verify that adequate records of the tank testing have been maintained	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
7	Corrosion protection systems, e.g. coatings, cathodic protection, impressed current, except for coating system subject to PSPC	Salt water ballast tanks with boundaries formed by the hull envelope, and also bulk carrier hold internal surfaces, coamings and hatch covers are to have an efficient protective coating. Safety aspects of cathodic systems to be dealt with separately.	Review and report on builder's & Manufacturer's documentation	Pt B, Ch 10, Sec 1 and the Rules for the Classification of Ships Pt E, Ch 4, Sec 3, [11]	Manufacturer's and builder's specification	Corrosion protection specifications	Verify that applied coatings are approved and review records of application	
							Verify that adequate records have been maintained and copied to the ship construction file	
	Application Antifouling Systems		Review		Painting specification	Paint specification and Mfq declaration	Verify that adequate records have been maintained and copied to the ship construction file	
7.1	Application of protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers subject to PSPC	Monitor implementation of the coating inspection requirements	Patrolling and review	IACS UI SC223.	Coating standard	Coating technical file	Verify that applied coatings are approved and review records of application in accordance with Chapter 7 of Annex to MSC.215(82).	
8	Installation, welding and testing of the following:							

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project	
8.1	Hatch covers	Tightness and securing	Witness	Pt B, Ch 12, Sec 3	Approved tank testing plan, shipbuilder's inspection records	Details required, structural drawings	Confirm leak test of hatch covers		
							Confirm operation and securing test		
8.2	Doors and ramps integral with the shell and bulkheads	Tightness and securing	Witness	Pt B, Ch 11, Sec 3	Approved tank testing plan, shipbuilder's inspection records	Details required, structural drawings	Confirm leak test		
							Confirm operation and securing test		
								Confirm safety device operation	
								Ensure correct maintenance logs/manuals supplied with the ship construction file	
8.3	Rudders	Fitting	Witness	Pt B, Ch 11, Sec 3	Approved plan, shipbuilder's inspection records	Details required, structural drawings	Confirm alignment and mounting and fitting up to the connection to the tiller		
							Confirm function test		
								Verify fitting of pintles and all securing bolts	
								Verify all fit-up records including all clearances maintained and placed into ship construction file	

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
8.4	Forgings and castings	Compliance with approved drawings, visual examination of welding and material, check alignment and deformations	Patrol of the process and witness of the completed item	The Rules for the Classification of Ships. Pt D, Ch 2, Sec 3 and Pt D, Ch 2, Sec 4	Approved plans, ship-builder's inspection records, ship-builder's and recognised standards and Rules as applicable, construction plan (steelwork subdivision)	Copies of certificates of forgings and castings	Verify castings and forgings against material certificate	
							Verify that correct welding and fit-up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	
							Verify that material certificates are included in the ship construction file	
8.5	Appendages						Verify that correct welding and fit-up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	

Pt A, Ch 3, Sec 1

No.	Shipbuilding quality control function	Survey Requirements for Classification	Survey Method required for Classification	Society Rule reference	Documentation available to Surveyor during construction	Documentation for Ship Construction File	Specific activities	Society proposals for the project
8.6	Equipment forming the watertight and weather-tight integrity of the ship, e.g. overboard discharges, air pipes, ventilators	Tightness and securing	Witness		Approved tank testing plan, shipbuilder's inspection records	Details required	Verify that correct welding and fit-up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	
				Pt C, Ch 1, Sec 10			Verify air pipes, vents etc. closing devices are approved type	
							Verify material certificates for overboard discharges, where applicable	
9	Principal dimensions	Within allowable tolerances	Review and witness	Guide for welding	Details required		Verify principal dimensions in accordance with recognised standards	
							Verify dimensions included in ship construction file	

## 2 Machinery and systems

### 2.1 General

#### 2.1.1 Scope (1/1/2017)

The scope of this Article [2] includes the following main activities:

- a) Examination of the parts of the ship covered by classification Rules and by applicable delegated statutory regulations for machinery construction, to obtain appropriate evidence that they have been built in compliance with the Rules and regulations, taking account of the relevant approved drawings.
- b) Appraisal of the manufacturing, construction, control and qualification procedures, including welding consumables, weld procedures, weld connections and assemblies, with indication of relevant approval tests (e.g for piping systems).
- c) Witnessing inspections and tests as required in the classification Rules for machinery and systems including materials, welding and assembly, the inspection and testing methods (e.g. by hydrostatic, leak testing, non-destructive examination, verification of geometry) and by whom.

Appraisal of materials and equipment used for machinery and systems and their inspection at works is not included in this Article [2]. Details of requirements for machinery and systems and equipment are given in:

- Part C, Chapter 1 for machinery equipment and piping systems,
- Part C, Chapter 2 for electrical systems,
- Part C, Chapter 3 for automation systems,
- The Rules for the Classification of Ships Part D for materials and welding
- Part B for anchoring and mooring system,
- Part D requirements for the specific Service Notations,
- Part E requirements for the Additional Class Notations.

### 2.2 Definitions

#### 2.2.1 Machinery (1/1/2017)

The Machinery components are generally defined as follows:

- a) Main and auxiliary engines, turbines and boilers
- b) Reduction gears, main thrust, intermediate shafts, tail-shafts and propellers
- c) Main and auxiliary systems for steering
- d) Pumps and other machinery items
- e) Systems in machinery spaces and in cargo areas
- f) Electrical equipment and installations
- g) Fire protection, detection and extinction
- h) Automation systems
- i) Machinery system for mooring and anchoring
- j) Machinery systems required by specific Service Notation

- k) Machinery systems required by specific Additional Class Notations.

#### 2.2.2 Documents (1/1/2017)

Reference to documents also includes electronic transmission or storage.

#### 2.2.3 Survey methods (1/1/2017)

The survey methods involving the Surveyor directly are as follows:

- a) Patrol is defined as the act of checking on an independent and unscheduled basis that the applicable processes, activities and associated documentation of the shipbuilding functions continue to conform to classification and delegated statutory requirements.
- b) Review is defined as the act of examining documents in order to determine traceability and identification, and to confirm that processes continue to conform to classification and delegated statutory requirements.
- c) Witness is defined as the attendance at scheduled inspections and tests in accordance with the agreed Inspection and Test Plans or equivalent to the extent necessary to check compliance with the survey requirements.

### 2.3 Application

#### 2.3.1 Location of construction (1/1/2017)

This Article [2] applies to the machinery items, as defined in [2.2.1] whether constructed and/or installed:

- a) at the shipbuilder's facilities
- b) by subcontractors/suppliers at the shipbuilder's facilities
- c) by subcontractors/suppliers at their own facilities or at other remote locations
- d) by machinery item manufacturers at the shipbuilder's facilities
- e) by machinery item manufacturers at their own facilities or at other remote locations.

### 2.4 Personnel

#### 2.4.1 Qualification and monitoring of exclusive Surveyors (1/1/2017)

The Society's Surveyors are to confirm through patrol, review and witness, as defined in [2.2.3], that machinery items are built and installed using approved plans in accordance with the relevant Rules and delegated statutory requirements. The Surveyors are to be qualified to be able to carry out their tasks, and procedures are to be in place to ensure that their activities are monitored.

### 2.5 Survey of Machinery installations

#### 2.5.1 Surveyable items (1/1/2017)

The items of machinery to undergo survey during their:

- a) construction/manufacturing
  - b) installation on board the new ship
- are those covered by the pertinent Parts of the Rules, as defined in [2.1.1], and delegated statutory requirements.



### 2.5.2 Materials and equipment supplied (1/1/2017)

During the construction and installation processes as required, evidence is also to be made available by the shipbuilder to the Surveyor to prove that the materials and equipment supplied to the ship have been built or manufactured under survey relevant to the classification Rules and delegated statutory requirements.

## 2.6 Newbuilding survey planning

### 2.6.1 Kick-off meeting (1/1/2017)

Prior to commencement of surveys for any machinery installation, the Society is to discuss with the shipbuilder at a kick-off meeting referred to in [1.7.1] the items related to the building and/or installation activities of machinery as per item [2.2.1] as applicable. The purpose of the meeting is to agree on how the list of specific activities is to be addressed. The meeting is to take into account the shipbuilder's construction facilities and ship type, including the list of proposed manufacturers, subcontractors and suppliers. A record of the meeting is to be made. If the Society has appointed a Surveyor for a specific newbuilding project or for the task of machinery installation surveillance, then this Surveyor is to attend the kick-off meeting. The shipbuilder is to be asked to agree to undertake ad hoc investigations during construction where areas of concern arise and to keep the Society advised of the progress of any such investigation. Whenever an investigation is undertaken, the builder is to be requested, in principle, to agree to suspend relevant construction activities if warranted by the severity of the problem.

### 2.6.2 Construction progress records (1/1/2017)

The shipyard shall be requested to advise of any changes to the activities agreed at the kick-off meeting and these are to be documented. For instance, if the shipbuilder chooses to use or change manufacturers of machinery items, subcontractors for machinery items, supplier of machinery items, or to incorporate any modifications necessitated by changes in production, in inspection methods, in rules and regulations, in structural modifications, or in the event where increased inspection requirements are deemed necessary as a result of a substantial non-conformance, or otherwise.

### 2.6.3 Fabrication quality standard (1/1/2017)

The quality standard of shipbuilding, manufacturers of machinery items, subcontractors for machinery items, supplier of machinery items, for the machinery installations during new constructions are to be reviewed and agreed during the kick-off meeting. Machinery items should be manufactured and installed according to applicable IACS Recommendations, or a recognized fabrication standard which has been accepted by the Society prior to the commencement of fabrication/construction. The work is to be carried out in accordance with the Rules and under survey of the Society.

### 2.6.4 Other attendees at the kick-off meeting (1/1/2017)

The kick-off meeting may be attended by other parties, such as the Owner or Administrations, subject to agreement by the shipbuilder.

### 2.6.5 Special cases of kick-off meeting (1/1/2017)

In the event of series ship production, consideration may be given to waiving the requirement for a kick-off meeting for the second and subsequent ships provided any changes are documented as required in [2.6.1] and in [2.6.3].

## 2.7 Examination and test plan for newbuilding activities

### 2.7.1 Plans to be provided (1/1/2017)

The shipbuilder is to provide plans of the items which are intended to be examined and tested. These plans need not be submitted for approval and examination at the time of the kick-off meeting. They are to include:

- a) list of machinery components to be fitted on board including the machinery arrangement plans, comprehensive of:
  - 1) proposals for the examination of piping steelwork, including booklets of typical arrangements, completed with the list of the materials and fittings;
  - 2) proposals for the examination of electric systems fittings, including booklets of typical arrangements, completed with the list of the materials and devices;
  - 3) proposal for the examination of propulsion system(s) arrangement and associated fittings ;
  - 4) proposal for the examination of steering system(s) arrangement and associated fittings;
  - 5) proposal for the examination of the machinery systems arrangement, as referred in Pt C, Ch 1, Sec 10, and associated fittings
  - 6) proposal for the examination of automation system(s) arrangement and associated fittings (if any);
  - 7) proposal for the examination of anchoring and mooring arrangements and associated fittings,
  - 8) proposal for the examination of cargo system(s) arrangement and associated fittings (if any);
  - 9) proposal for the examination of Additional class Notation machinery systems arrangement and associated fittings (if any);
- b) proposal for non destructive examination of piping steelwork, and in general for all systems requiring welding for their manufacture or installation ;
- c) proposals for testing of machinery components after their manufacture or installation on board;
- d) any other proposals specific to the ship type or to the delegated statutory requirements.

### 2.7.2 Submittal of plans to the Surveyors (1/1/2017)

The plans and any modifications to them are to be submitted to the Surveyors in sufficient time to allow review before the relevant survey activity commences.

## 2.8 Proof of the consistency of surveys

### 2.8.1 Evidence for survey planning and activities (1/1/2017)

Inspection and test records, checklists etc are to be kept in order to provide evidence that the Society's Surveyors have

complied with the requirements of the newbuilding survey planning and duly participated in the relevant activities shown in the shipbuilder's examination and test plans.

## 2.9 Inspection and tests of machinery components

### 2.9.1 Inspection and tests at workshop (1/1/2017)

Inspection and testing of machinery components, at the workshop, shall be carried out according to the provisions of the applicable classification Rules and delegated statutory regulations.

### 2.9.2 Inspection and tests at dock and sea trials (1/1/2017)

Inspection and testing of machinery components during sea trials are to be carried out according to the provisions of the applicable classification Rules and delegated statutory regulations. The following Parts of the Rules are applicable:

- a) main propulsion systems, including but not limited to propeller shafting line: Pt C, Ch 1, Sec 15
- b) auxiliary systems for propulsion and other services systems: Pt C, Ch 1, Sec 15
- c) main and auxiliary systems for steering: Pt C, Ch 1, Sec 15
- d) main and auxiliary piping systems: Pt C, Ch 1, Sec 15 and Pt C, Ch 1, Sec 10
- e) main, emergency and auxiliary electrical system for primary, secondary and emergency systems: Pt C, Ch 2, Sec 15
- f) automation systems: Pt C, Ch 3, Sec 5 and Pt C, Ch 3, Sec 6
- g) machinery system for mooring and anchoring: Pt B, Ch 11, Sec 3
- h) machinery systems required for specific Service Notations: Part D
- i) machinery systems required for specific Additional Class Notations: Part E.

## SECTION 2

## ANNUAL SURVEY

### 1 General

#### 1.1

**1.1.1** The requirements of this Section apply to annual surveys of all ships. The specific requirements for annual surveys related to service notations and additional class notations assigned to ships are addressed in Chapter 4 and Chapter 5, respectively.

**1.1.2** At the time of annual surveys, the ship is to be generally examined. The survey is to include a visual inspection of the hull, equipment and machinery of the ship and some tests thereof, so far as necessary and practicable in order to verify that the ship is in a satisfactory and efficient general condition and is properly maintained.

**1.1.3** Owners are reminded that, in compliance with the requirements in Ch 2, Sec 2, [11.3], any modification to the ship's hull, equipment and machinery affecting its classification is to be made known to the Society.

### 2 Hull

#### 2.1 Scope

##### 2.1.1

The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, hatch covers,

hatch coamings, closing appliances, equipment and related piping are maintained in a satisfactory condition.

#### 2.2 Hull and hull equipment

##### 2.2.1 (1/1/2017)

The survey is to include a general external examination and testing, where appropriate, verifying the efficient condition of the following items, as applicable:

- outer shell plating above the waterline, relevant shell doors and accessible parts of the rudder(s)
- plating of bulkhead deck and exposed decks, superstructures, with their openings and means of closure
- cargo hatchways and other openings on exposed decks, with their coamings and their means of closure and securing arrangements (for details see Sec 1, [2.3])
- sidescuttles and deadlights, garbage, chutes and other openings with their means of closure
- bulwarks, guard rails, freeing ports, gangways and life-lines, ladders
- scuppers and sanitary discharges, valves on discharge lines and their controls
- the means provided to minimise water ingress through the spurling pipes and chain lockers
- the arrangements for closing openings in the shell plating below the main deck

- ventilators, air pipes, overflow pipes and gas vent pipes, with their means of closure and flame screens, where required. In particular:
  - examination of the weld connection between air pipes and deck plating
  - examination of flame screens on vents to all bunker tanks
  - examination of ventilators, including closing devices, if any
- external examination of all air pipe heads installed on exposed decks including all automatic air pipe heads installed on the exposed decks (see Note 2)
- fittings and appliances for timber deck cargoes, where applicable
- deck equipment such as lifeboat davit foundations, bollards, fairleads, hawse pipes, etc., masts and associated rigging, including lightning conductors
- equipment of chain cables for anchors, windlass, mooring lines and mooring winches, where required
- confirmation that the towing and mooring equipment is properly marked with any restriction associated with its safe operation
- deck fittings, their pedestals, if any, and the hull structures associated with towing and mooring
- watertight bulkheads, their watertight doors and associated local and remote controls, and their watertight penetrations
- main and auxiliary steering arrangements, including their associated equipment and control systems, and manoeuvring gear
- fire divisions and fire doors, dampers in ventilation ducts, means of closure of skylights and other openings
- confirmation that emergency escape routes from accommodation and service spaces are satisfactory
- accessible holds, in particular in areas likely to be damaged by handling operation
- confirmation that the drainage from enclosed cargo spaces situated on the bulkhead deck is satisfactory
- engine room
- availability of loading manual or, where required, electronic loading instrument, including standard test
- availability of approved stability documentation
- confirmation that no new materials containing asbestos have been installed on board.

Note 1: Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested where doubts arise.

Note 2: Air pipe heads installed on the exposed decks are those extending above the bulkhead deck or superstructure decks

**2.2.2** Suspect areas identified at previous class renewal surveys are to be examined. Areas of substantial corrosion identified at previous class renewal or intermediate surveys are to be subjected to thickness measurements.

**2.2.3** Ballast tanks are to be internally examined when required as a consequence of the results of the class renewal survey, see Sec 3, [2.4.2], or the intermediate survey, see Sec 2, Tab 1.

Thickness measurements are to be carried out as considered necessary by the Surveyor.

## **2.3 Cargo hatch covers and coamings, weather decks and ship side plating above the waterline**

### **2.3.1**

The Owner or his representative is to declare to the attending Surveyor that no changes have been made to the hatch covers, hatch coamings and their securing and sealing devices without prior approval of the Society.

The survey of hatch covers and coamings is to include:

- a) when fitted with portable covers, or wooden or steel pontoons, checking of the satisfactory condition of:
  - wooden covers and portable beams, carriers or sockets for the portable beams, and their securing devices
  - steel pontoons
  - tarpaulins
  - cleats, battens and wedges
  - hatch securing bars and their securing devices
  - loading pads/bars and the side plate edge
  - guide plates and chocks
  - compression bars, drainage channels and drain pipes (if any)
- b) when fitted with mechanically operated steel covers, checking of the satisfactory condition of:
  - hatch covers
  - tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels and, if any, drain pipes)
  - clamping devices, retaining bars, cleating
  - chain or rope pulleys
  - guides
  - guide rails and track wheels
  - stoppers, etc.
  - wires, chains, gypsies, tensioning devices
  - hydraulic system essential to closing and securing
  - safety locks and retaining devices
- c) checking of the satisfactory condition of hatch coaming plating and its stiffeners
- d) random checking of the satisfactory operation of mechanically operated hatch covers is to be made including:
  - stowage and securing in open condition;
  - proper fit and efficiency of sealing in closed condition;
  - operational testing of hydraulic and power components, wires, chains and link drives.

## 2.4 Suspect areas

### 2.4.1

Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine the extension of areas of substantial corrosion. Sec 3, Tab 2 may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

## 2.5 Ballast tanks

### 2.5.1

Examination of ballast tanks when required as a consequence of the results of the class renewal survey and intermediate survey is to be carried out. When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurement is to be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements is to be increased to determine the extension of areas of substantial corrosion. Sec 3, Tab 2 may be used as guidance for these additional measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

## 2.6 Shell and inner doors

**2.6.1** The requirements of this item apply to all shell and inner doors fitted on these ships.

**2.6.2** For the scope of survey of shell and inner doors, the following definitions are applicable:

- Securing device: a device used to keep the door closed by preventing it from rotating about its hinges
- Supporting device: a device used to transmit external or internal loads from the door to a securing device and from the securing device to the ship's structure, or a device other than a securing device, such as a hinge, stopper or other fixed device, that transmits loads from the door to the ship's structure
- Locking device: a device that locks a securing device in the closed position.

**2.6.3** It is to be checked that the operating procedures for closing the shell and inner doors are kept on board and posted at appropriate places.

When required, the Operating and Maintenance Manual is also to be checked for the verification of its approval and of any modification, reported repairs and proper endorsement by operating personnel.

**2.6.4** The structural arrangements as well as welding are to be examined, including:

- plating, primary structure and secondary stiffeners
- hinging arms, hinges and bearings, thrust bearings
- hull and door side supports of securing, supporting and locking devices
- shell plating surrounding the openings and the securing, supporting and locking devices.

Hinge, bearing and thrust bearing clearances are to be measured when no dismantling is necessary for the measurement, or when the function tests detailed below are not satisfactory.

**2.6.5** A close visual inspection of securing, supporting and locking devices, including their weld connections, is to be carried out and clearances are to be measured as required.

Non-destructive tests and/or thickness measurements may be required by the Surveyor after visual examination or in cases where cracks or deformations have been found.

**2.6.6** A close visual inspection of sealing arrangements (packing material, rubber gaskets, packing retaining bars or channels) is to be carried out. For the tightness hose test, refer to Sec 1, [2.6.8].

**2.6.7** The drainage arrangements including bilge wells, drain pipes and non-return valves are to be visually examined. A test of the bilge system between the inner and outer doors and that of the vehicle deck is to be carried out.

**2.6.8** Function tests are to be carried out as follows, according to the required and/or existing equipment on board:

- a) doors are to be examined during a complete opening and closing operation; during this operation, the proper working of hinging arms and hinges, proper engagement of the thrust bearings and proper working of devices for locking the door in open position are to be checked
- b) securing, supporting and locking devices are to be examined during a complete opening and closing operation; the following items are to be checked:
  - opening/closing system and securing/locking devices are interlocked in such a way that they can only operate in proper sequence
  - mechanical lock of the securing devices
  - the securing devices remain locked in the event of loss of hydraulic fluid, if they are of hydraulic type
- c) indicators of open/closed position of doors and of securing/locking devices at remote control stations are to be checked; other safety devices such as isolation of securing/locking hydraulic system from other hydraulic systems, access to operating panels, notice plates and warning indicator lights are to be checked
- d) a tightness hose test or equivalent of sealing arrangements is to be carried out

- e) a working test of the indicator system is to be carried out, including checking of:
  - visual indicators and audible alarms on the navigation bridge and operating panel
  - lamp test function, fail safe performance, power supply for indicator system
  - proper condition of sensors and their protection from water, ice formation and mechanical damage
- f) a working test of the water leakage detection system for inner doors and for the area between the bow door and the inner door (as applicable) is to be carried out and the proper function of audible alarms on the navigation bridge and the engine control room panel (as applicable) is to be ascertained
- g) electrical equipment for opening, closing and securing the doors is to be examined.

## 2.7 Internal platforms and ramps

**2.7.1** The annual survey of internal movable platforms and ramps, if any, (excluding those considered as inner doors and covered in Sec 1, [2.6]) and related equipment consists of:

- a general examination of the installation, particular attention being paid to the condition of steel cables
- confirmation of the proper operation of platforms/ramps and of mechanical stops and locks
- checking, as far as practicable, of the alarms and safety devices.

## 3 Machinery and systems

### 3.1 General machinery installations

#### 3.1.1 (1/1/2017)

The survey of general machinery installations is to cover the following items:

- general examination of machinery and boiler spaces with particular attention to the fire and explosion hazards; confirmation that emergency escape routes are practicable and not blocked
- general examination of the machinery, steam, hydraulic, pneumatic and other systems and their associated fittings, for confirmation of their proper maintenance
- testing of the means of communication and order transmission between the navigating bridge and the machinery control positions and other control stations
- confirmation that the rudder angle indicator on the bridge is in working order
- examination, as far as practicable, of the bilge pumping systems and bilge wells, including operation of the pumps, remote reach rods and level alarms, where fitted
- visual examination of the condition of any expansion joints in sea water systems
- external examination of pressure vessels other than boilers and their appurtenances, including safety devices,

foundations, controls, relieving gear, high pressure piping, insulation and gauges

- confirmation that no new materials containing asbestos have been installed on board.

**3.1.2** When the ship is equipped with a refrigerating plant (whether or not covered by an additional class notation), the annual survey is to include the external examination of:

- pressure vessels of the installation to the same extent as indicated in Sec 1, [3.1.1]
- refrigerant piping, as far as practicable

Additionally, surveys requirements in Part A, Ch 5, Sec 8 of the Rules for the Classification of Ships apply to the refrigerating installations related to preservation of ship's domestic victuals and to air conditioning of accommodation spaces including pertaining service spaces and control stations as well as garbage rooms.

**3.1.3** When the ship is equipped with thruster installations, the annual survey is to include:

- an external examination of the machinery installation
- an operating test of the complete installation.

### 3.2 Boilers

#### 3.2.1

For the boiler survey reference is to be made to the Rules for the Classification of Ships .

### 3.3 Electrical machinery and equipment

**3.3.1** The survey of electrical machinery and equipment is to cover the following items:

- general examination, visually and in operation, as feasible, of the electrical installations for power and lighting, in particular main and emergency generators, electric motors, switchboards, switchgears, cables and circuit protective devices, indicators of electrical insulation and automatic starting, where provided, of emergency sources of power
- checking, as far as practicable, the operation of emergency sources of power and, where they are automatic, also including the automatic mode.

**3.3.2** The survey is also to cover the bridge control of propulsion machinery, and related arrangements (alarms and safety devices), when fitted.

The survey of an automated installation covered by an additional class notation is detailed in Chapter 5.

### 3.4 Fire protection, detection and extinction

**3.4.1** The survey of fire prevention and other general arrangements is to cover the following items:

- checking that fire control plans are properly posted
- examination and testing, as feasible, of the operation of manual and/or automatic fire doors, where fitted
- checking, as far as practicable, that the remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces and for shutting off deliv-

ering or receiving oil products and JP5-NATO(F44) and, where fitted, the remote controls for stopping fans in accommodation spaces and the means of cutting off power to the galley are in working order

- examination of the closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnel, where applicable
- examination, as far as practicable, and testing, as feasible and at random, of the fire and/or smoke detection systems.

**3.4.2** The survey requirements for all types of fire-fighting systems that are usually found on board ships related either to machinery spaces or to oil products and JP5-NATO(F44) tanks and/or to spaces such as hangar, vehicle spaces, ro-ro vehicle spaces, helicopter and/or aircraft deck or to accommodation spaces, irrespective of the service notation assigned, are the following:

a) water fire system

- examination of the fire main system and confirmation that each fire pump including the emergency fire pump can be operated separately so that the two required powerful jets of water can be produced simultaneously from different hydrants, at any part of the ship whilst the required pressure is maintained in the fire main
- checking that fire hoses, nozzles, applicators, spanners and international shore connection (where fitted) are in satisfactory working condition and situated at their respective locations

b) fixed gas fire-extinguishing system

- external examination of receivers of CO<sub>2</sub> (or other gas) fixed fire-extinguishing systems and their accessories, including the removal of insulation for insulated low pressure CO<sub>2</sub> containers
- examination of fixed fire-fighting system controls, piping, instructions and marking; checking that the maintenance and servicing, including the filling ratio of gas bottles, have been carried out not more than two years beforehand and that the dates of the last tests of the system are in order
- test of the alarm triggered before the CO<sub>2</sub> is released

c) sprinkler system

- examination of the system, including piping, valves, sprinklers
- checking of section valves
- check of the alarm system of section valves' activation

d) water-spraying system

- examination of the system, including piping, nozzles, distribution valves and header tank
- test of the starting of the pump activated by a pressure drop (applicable only for machinery spaces)

e) fixed foam systems (low or high expansion)

- examination of the foam system
- test to confirm that the minimum number of jets of water at the required pressure in the fire main is obtained when the system is in operation
- checking the supplies of foam concentrate and receiving confirmation that it is periodically tested (not later than three years after manufacture and annually thereafter) by the Manufacturer or an agent.

f) dry powder system

- examination of the dry powder system, including the powder release control devices
- checking the supplies of powder contained in the receivers and that it has maintained its original smoothness
- checking that the pressure of propelling compressed air contained in the relevant bottles is satisfactory.

g) water mist system

- examination of the system, including piping, valves, nozzles and header tanks
- test of automatic starting of the pump(s) activated by a pressure drop
- check of the alarm system of section valves' activation.

**3.4.3** As far as other fire-fighting equipment is concerned, it is to be checked that:

- semi-portable and portable fire extinguishers and foam applicators are in their stowed positions, with evidence of proper maintenance and servicing, and detection of any discharged containers; the periodical servicing of the vessels containing the extinguishing agents is to be in accordance with the periodicity given in Sec 1, Tab 1.
- firemen's outfits are complete and in satisfactory condition.

**Table 1 : Periodical servicing of vessels containing the extinguishing agents of the portable fire extinguishers on board ships**

Type of extinguisher	Charge check	Hydrostatic test	Test pressure
Water and foam	replacement of charge each year	at each class renewal survey	1,5 times the working pressure (w.p.)
Powder with shell not kept under pressure	check each year replacement of charge at 5-year intervals	(5-year intervals)	(2 N/mm <sup>2</sup> if the w.p. is unknown)
CO <sub>2</sub>	at 2-year intervals	extinguishers sent ashore for refilling when found empty or low charged (less than 90% for CO <sub>2</sub> with low pressure for powder extinguishers)	25 N/mm <sup>2</sup>
Powder with shell kept under pressure			1,5 times the w.p. (2 N/mm <sup>2</sup> if the w.p. is unknown)
Small compressed air or gas bottles used in fire extinguishers not permanently kept under pressure	internal inspection at class renewal surveys	at class renewal surveys where internal inspection is not possible	2 times the w.p. 25 N/mm <sup>2</sup> if of a CO <sub>2</sub> type with safety devices 35 N/mm <sup>2</sup> if of a CO <sub>2</sub> type without safety devices



## SECTION 3

## INTERMEDIATE SURVEY

### 1 General

#### 1.1

**1.1.1** The requirements of this Section apply to intermediate surveys of all ships. The specific requirements for intermediate surveys related to service notations and additional class notations assigned to ships are addressed in Chapter 4 and Chapter 5, respectively.

**1.1.2** The intermediate survey is to include examination and checks on a sufficiently extensive part of the structure to show that the structures of the ship are in satisfactory condition so that the ship is expected to operate until the end of the current period of class, provided that the ship is

properly maintained and other surveys for maintenance of class are duly carried out during this period.

### 2 Hull, dry products (e.g. ammunition) holds, oil products and JP5-NATO (F44) tanks and fresh water tanks

#### 2.1

**2.1.1** The requirements given in Sec 2, Tab 1 for the survey and testing of salt water ballast tanks, dry products (e.g. ammunition) holds, oil products and JP5-NATO (F44) tanks and fresh water tanks are to be complied with.

**Table 1 : Intermediate survey of hull (all ships) (1/1/2017)**

ITEM	Age of ship (in years at time of intermediate survey)		
	5 < age ≤ 10	10 < age ≤ 15	age > 15
SALT WATER BALLAST SPACES	Representative spaces internally examined Thickness measurements, if considered necessary by the Surveyor See (1) (2) (3)	All spaces internally examined Thickness measurements, if considered necessary by the Surveyor Tightness of inner bottom plating of cargo holds in way of double bottom salt water ballast tanks checked See (1) (3)	
DRY CARGO HOLDS			Selected dry cargo holds internally examined
OIL PRODUCT AND JP5-NATO(F44) OR FRESH WATER TANKS			Selected tanks internally examined
<p>(1) If no visible structural defects are present, the examination may be limited to verifying that the protective coating remains efficient.</p> <p>(2) Where the protective coating is found to be in poor condition, where a soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, the examination is to be extended to other ballast spaces of the same type.</p> <p>(3) For salt water ballast spaces other than double bottom tanks, where a protective coating is found to be in poor condition and is not renewed, where soft or semi-hard coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined at annual surveys. The Society may consider waiving such internal examination at annual surveys of tanks protected with soft or semi-hard coating, whose size is 12 m<sup>3</sup> or less.</p> <p>For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft or semi-hard coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.</p> <p><b>Note 1:</b> Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested should doubts arise.</p>			

## SECTION 4

## CLASS RENEWAL SURVEY

### 1 General

#### 1.1

**1.1.1** The requirements of this Section apply to class renewal surveys of all ships. The specific requirements for class renewal surveys related to service notations and additional class notations assigned to ships are addressed in Chapter 4 and Chapter 5, respectively.

#### 1.1.2 (1/1/2017)

The class renewal survey is to include, in addition to the requirements of the annual survey, sufficient extensive examination and checks to show that the structures, main and auxiliary machinery, systems, equipment and various arrangements of the ship are in satisfactory condition or restored to such condition as to allow the ship to operate for the new period of class to be assigned, provided that the ship is properly maintained and other surveys for maintenance of class are duly carried out during this period.

The examinations of the hull are to be supplemented by thickness measurements and testing as deemed necessary, to ensure that the structural integrity remains effective and sufficient to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

**1.1.3** The Owner is to provide the necessary facilities to enable this class renewal survey. The conditions for survey as detailed in Ch 2, Sec 2, [2.5] to Ch 2, Sec 2, [2.7] are to be met.

**1.1.4** When the ship is under the continuous survey system for machinery and/or hull, the scope of the class renewal survey as described in this Section is carried out on a continuous basis over the period of class according to the procedure laid down in Ch 2, Sec 2, [4.3].

When the machinery installation is surveyed under the Planned Maintenance System, a specific program of survey replaces the scope of the class renewal survey of machinery and systems as laid down in Sec 3, [3] below, according to the procedure laid down in Ch 2, Sec 2, [4.4].

### 2 Hull and hull equipment

#### 2.1 Bottom survey

**2.1.1** The class renewal survey is to include a bottom survey as laid down in [2.2.1].

#### 2.1.2

The anchors and chain cables are to be ranged, examined and the required complement and condition verified. The chain locker, holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker tested. At class renewal surveys of ships more than 5 years of age, chain cables are to be gauged and renewed in

cases where their mean diameter is worn below the limits allowed.

#### 2.2 Decks, hatch covers and equipment

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

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

The sheathing of wood-sheathed steel decks may be removed, at the Surveyor's discretion, in the case of doubt as to the condition of plating underneath.

Due attention is to be given to the examination in way of end and side openings and related shell and inner doors.

**2.2.2** The survey of hatch covers and coamings is to include:

- checking of the satisfactory operation of all mechanically operated hatch covers: stowage and securing in open condition, proper fit, locking and efficiency of sealing in closed position, operational testing of hydraulic and power components, wires, chains and link drives
- checking of the effectiveness of sealing arrangements of all hatch covers by means of hose testing or equivalent
- thickness measurements of coaming and attached stiffeners, hatch cover plating and stiffeners (see Sec 3, Tab 2).

**2.2.3** The survey of hull equipment is to cover the following points:

- windlass and chain stoppers, with disassembly as deemed necessary to verify the condition of the equipment and control and safety devices, hawse pipes
- steering arrangements, including steering gear, control and indication devices, operational tests and disassembly as deemed necessary; in the case of chain and rod gears, chains, rods, sheaves, pins and rollers are to be examined for wear
- connection of masts and standing rigging to the hull structure as well as condition of structure underneath.

**2.2.4** Piping systems outside tanks and compartments are to be visually examined and pressure tested as necessary, as per the requirements laid down for the class renewal survey of machinery and systems; see Sec 3, [3.5].

#### 2.2.5

For all ships, automatic air pipe heads are to be completely examined (both externally and internally) as indicated in Sec 3, Tab 4.

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

## 2.3 Holds and other dry compartments

**2.3.1** Holds, 'tweendecks, cofferdams, pipe tunnels and duct keels, void spaces and other dry compartments which are integral to the hull structure are to be internally examined, ascertaining the condition of the structure, bilges and drain wells, sounding, venting, pumping and drainage arrangements

**2.3.2** Machinery and boiler spaces, pump rooms and other spaces containing machinery are to be internally examined, ascertaining the condition of the structure. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and bulkheads in way of tank tops and bilge wells. Particular attention is to be given to the sea suction, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspected, thickness measurements are to be carried out, and renewals or repairs effected when wastage exceeds allowable limits.

Piping systems inside these spaces are to be dealt with according to Sec 3, [3.5].

### 2.3.3 (1/1/2017)

Chain lockers are to be internally examined, while the anchor chains are ranged (see Sec 3, [2.1.2]). The pumping arrangement of the chain lockers is to be tested.

## 2.4 Tanks

**2.4.1** The type and number of tanks to be internally examined at each class renewal survey are detailed in Sec 3, Tab 1, according to the age of the ship.

This internal examination is to ascertain the condition of the structure, bilges and drain wells, sounding, venting, pumping and drainage arrangements, including piping systems and their fittings. Due attention is to be given to plating or double plates below the lower end of sounding and suction pipes.

Where wastage is evident or suspected, thickness measurements are to be carried out, and renewals or repairs effected when wastage exceeds allowable limits.

Where the inner surface of the tanks is covered with cement or other compositions, the removal of coverings may be waived provided they are examined, found sound and adhering satisfactorily to the steel structures.

Note 1: For examination of independent (non-structural) tanks, refer to Sec 3, [3.5.6].

Note 2: Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested when the ship is more than 10 years old.

### 2.4.2 (1/1/2017)

For salt water ballast spaces other than double bottom tanks, where a protective coating is found to be in poor condition, as defined in Ch 2, Sec 2, [2.2.12] and is not renewed, where soft or semi-hard coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined at annual surveys. The Society may consider waiving such internal examination at annual surveys of tanks protected with soft or semi-hard coating, whose size is 12 m<sup>3</sup> or less.

For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft or semi-hard coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined at annual surveys.

### 2.4.3

Boundaries of double-bottom, deep, ballast, peak, and other tanks, including holds adapted for the carriage of salt water ballast, are to be tested with a head of liquid to the top of air pipes or to the top of hatches for ballast/cargo holds.

**Table 1 : Requirements for internal examination of structural tanks at class renewal survey**

Type and use of structural tanks	Age of ship (in years at time of class renewal survey )			
	age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Peaks (all uses)	all	all	all	all
Salt water ballast tanks (all types)	all	all	all	all
Fresh water tanks			all	
Fuel oil - diesel oil tanks	none	one	two	half (1)
Lubricating oil tanks	none	none	none	one
Oil product and JP5-NATO(F44) tanks	none	one	half	all

(1) Half of the tanks considered are to be internally examined every 5 years (tanks not internally examined may be examined externally from accessible boundaries); at the next class renewal survey the tanks not inspected at the previous survey are to be internally examined, and so on alternatively, so that each tank is internally examined every second class renewal survey.

**Note 1:** Independent non-structural tanks are to be surveyed according to Sec 3, [3.5.6].

**Note 2:** The extent of the survey of tanks dedicated to liquids other than those indicated in this table will be considered by the Society on a case by case basis according to the nature of the liquids.

**Note 3:** If a selection of tanks is accepted to be examined, then different tanks are to be examined at each class renewal survey, on a rotational basis.

**2.4.4**

Boundaries of fuel oil, lube oil, oil product, JP5-NATO(F44) and fresh water tanks are to be tested with a head of liquid to the maximum filling level of the tank. Tank testing of fuel oil, lube oil, oil product, JP5-NATO(F44) and fresh water tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

**2.4.5** Other testing procedures, in particular those specified in Pt B, Ch 11, Sec 3, [2] for the initial survey during construction, may be accepted.

For integral tanks which are intended to contain liquid cargoes such as edible oil, the Surveyor may waive the requirement specified in Sec 3, [2.4.4] subject to a satisfactory internal examination.

**2.5 Thickness measurements**

**2.5.1** Thickness measurements are to be carried out according to the procedure detailed in Ch 2, Sec 2, [2.3].

The extent of thickness measurements is detailed in Sec 3, Tab 2, according to the age of the ship.

**2.5.2** When the structure is coated and the coating is found to be in good condition, as defined in Ch 2, Sec 2, [2.2.12], the Surveyor may, at his discretion, accept a reduced program of thickness measurements in the corresponding areas. Other effective protective arrangements may also be considered.

**2.5.3** When thickness measurements indicate substantial corrosion, the number of thickness measurements is to be increased to determine the extent of substantial corrosion. Sec 3, Tab 3 may be used as guidance for additional thickness measurements.

**Table 2 : Requirements for thickness measurements at class renewal survey**

Age of ship (in years at time of class renewal survey) (1) (2)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15 (4)	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	One transverse section of deck plating within 0,5 L amidships	Two transverse sections within 0,5 L amidships (3)	A minimum of three transverse sections within 0,5 L amidships
	Side plating of the wind and water region, at one transverse section within 0,5 L amidships	Internals in forepeak tank	Internals in forepeak and after peak tanks
		Side plating of the wind and water region, at two transverse sections within 0,5 L amidships	All exposed main deck plating full length
		All hatch covers and coamings (plating and stiffeners)	Representative exposed superstructure deck plating (poop, bridge, and forecastle deck)
			Lower strake and strakes in way of tween decks of all transverse bulkheads in cargo dry products (e.g. ammunition), oil products and JP5-NATO (F44) spaces and ballast spaces together with internals in way
			All wind and water strakes, port and starboard, full length
<p>(1) Thickness measurements locations should be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering the ships's arrangement and condition of protective coatings</p> <p>(2) Thickness measurements of internals may be modified at the discretion of the Surveyor if the protective coating is in GOOD condition.</p> <p>(3) For vessel less than 100 metres in length, the number of transverse sections required at the class renewal survey for ships 10 &lt; age ≤ 15 may be reduced to one, and the number of transverse sections required at subsequent class renewal surveys may be reduced to two.</p> <p>(4) For vessel more than 100 metres in length, at the class renewal survey for ships 10 &lt; age ≤ 15, thickness measurements of exposed deck plating within 0,5 L amidship may be required.</p>			

Age of ship (in years at time of class renewal survey) (1) (2)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15 (4)	age > 15
			All keel plates full length. Also additional bottom plates in way of cofferdams, machinery space, and aft end of tanksh
			All hatch covers and coamings (plating and stiffeners)
			Plating of seachests. Shell plating in way of overboard discharges as considered necessary by the attending Surveyor.
<p>(1) Thickness measurements locations should be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering the ships's arrangement and condition of protective coatings</p> <p>(2) Thickness measurements of internals may be modified at the discretion of the Surveyor if the protective coating is in GOOD condition.</p> <p>(3) For vessel less than 100 metres in length, the number of transverse sections required at the class renewal survey for ships 10 &lt; age ≤ 15 may be reduced to one, and the number of transverse sections required at subsequent class renewal surveys may be reduced to two.</p> <p>(4) For vessel more than 100 metres in length, at the class renewal survey for ships 10 &lt; age ≤ 15, thickness measurements of exposed deck plating within 0,5 L amidship may be required.</p>			

**Table 3 : Guidance for additional thickness measurements in way of substantial corrosion areas**

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

**Table 4 : Survey requirements for automatic air pipe heads at class renewal surveys**

Age of ship (in years at time of class renewal survey due date)		
age ≤ 5	5 < age ≤ 10	age > 10
<ul style="list-style-type: none"> <li>Two air pipe heads, one port and one starboard, located on the exposed decks in the forward 0.25 L, preferably air pipes serving ballast tanks.</li> <li>Two air pipe heads, one port and one starboard, on the exposed decks, serving spaces aft of 0.25 L, preferably air pipes serving ballast tanks.</li> </ul> <p>See (1) and (2)</p>	<ul style="list-style-type: none"> <li>All air pipe heads located on the exposed decks in the forward 0.25 L</li> <li>At least 20% of air pipe heads on the exposed decks serving spaces aft of 0.25 L, preferably air pipes serving ballast tanks</li> </ul> <p>See (1) and (2)</p>	<ul style="list-style-type: none"> <li>All air pipe heads located on the exposed decks</li> </ul> <p>See (3)</p>
<p>(1) The selection of air pipe heads to be inspected is left to the attending Surveyor.</p> <p>(2) According to the results of this inspection, the Surveyor may require the inspection of other heads located on the exposed decks.</p> <p>(3) Exemption may be considered for air pipe heads where there is substantiated evidence of replacement within the previous five years.</p>		

### 3 Machinery and systems

#### 3.1 General

**3.1.1** The survey items listed below are to be covered to the satisfaction of the Surveyor. However, other survey alternatives deemed equivalent by the Surveyor in relation to the characteristics and general condition of the ship concerned may also be accepted.

Note 1: Attention is drawn to the requirement Ch 2, Sec 2, [2.5.1] regarding safe execution of surveys, in particular as regards health hazards related to asbestos.

#### 3.1.2 Machinery verification runs (1/1/2017)

As part of the Special Survey of Machinery, a dock trial (or functional tests) is to be carried out to attending Surveyors' satisfaction to confirm satisfactory operation of main and auxiliary machinery. If significant repairs are carried out to main or auxiliary machinery or steering gear, consideration should be given to a sea trial to attending Surveyors' satisfaction.

#### 3.2 Main and auxiliary engines and turbines

##### 3.2.1 General

Depending on the type of machinery, the following parts are to be opened up as necessary for inspection. Parts and components are to be pressure tested as appropriate or as deemed necessary by the Surveyor. A working test is also to be carried out, including testing of alarms and safety devices.

##### 3.2.2 Internal combustion engines

- a) Columns and entablature
- b) Cylinders with their liners, cylinder covers (together with valves and valve gear), pistons with their rods, crossheads, slippers and guides (or gudgeon pins), connecting rods (with their top and bottom end bearings), control gear, driven scavenge pumps, driven air compressors, driven fuel pumps, supercharging blowers, fuel injection pumps, turning gear, etc.
- c) Crankshafts (together with their main bearings)
- d) Reverse gear, reduction gear and clutches, if fitted.

##### 3.2.3 Steam turbines

For the steam turbines reference is to be made to the Rules for the Classification of Ships.

##### 3.2.4 Gas turbines

- a) Casings, rotors and disks, impellers and blading of all turbines and compressors, combustion chambers, burners, heat exchangers, gas piping, compressed air piping with fittings, starting and reverse arrangements
- b) Shafts and their flexible couplings.

##### 3.2.5 Electric propulsion

Where the propulsion machinery consists of an electrical system, the propulsion motors, generators, cables and all ancillary electrical gear, exciters and ventilating plant (including coolers) associated therewith are to be examined and the insulation resistance to earth tested. Due attention

is to be given to windings, commutations and sliprings. The operation of protective gear and alarm devices is to be checked, as far as practicable. Interlocks intended to prevent unsafe operations or unauthorised access are to be checked to verify that they are functioning correctly.

##### 3.2.6 Thruster installations

When the ship is equipped with thruster installations, the class renewal survey is also to include:

- a thorough examination of the machinery and electrical installation, as applicable
- an external examination of the propulsive part of the installation to be carried out at the dry dock survey due as part of the class renewal survey. During this examination other checks such as clearance readings, tightness of hub and blade sealing for controllable pitch propellers are to be verified. Locking arrangements for bolts, if fitted, are to be checked. Results of lubricating oil analysis to detect possible deterioration of internal gears and bearings or the presence of water are to be confirmed as acceptable. The Manufacturer's requirements may be taken into account. Dismantling of the assembly for the examination of internal parts may be required if the foregoing checks are not satisfactory
- a running test of the system under operating conditions.

#### 3.3 Reduction gears, main thrust and intermediate shaft(s)

**3.3.1** Reduction gears complete with all wheels, pinions, shafts, couplings, bearings and gear teeth, including incorporated clutch arrangements, are to be opened up, as deemed necessary by the Surveyor, for visual inspection. For complicated assemblies, gears and roller bearings may be inspected without dismantling.

**3.3.2** All shafts, thrust blocks and bearings are to be examined.

#### 3.4 Pumps and other machinery items

##### 3.4.1 General

The items listed in Sec 3, [3.4.2] are to be opened up, as deemed necessary by the Surveyor, for visual inspection. Their parts and components are to be pressure tested as appropriate and considered necessary by the Surveyor. A working test is also to be carried out, including testing of alarms and safety devices if deemed necessary by the Surveyor.

##### 3.4.2 Items to be surveyed

- a) Air compressors with their intercoolers, filters and/or oil separators and safety devices
- b) Heat exchangers, ventilation fans for boilers and other equipment used for essential services
- c) Piston pumps and centrifugal pumps for sea water, bilge and salt water ballast
- d) Screw pumps, gear pumps and centrifugal pumps other than those listed in c) above (opening up is not required).

### 3.5 Systems in machinery spaces

**3.5.1** Valves, cocks and strainers of the bilge and ballast systems are to be opened up, thoroughly or partly as deemed necessary by the Surveyor, for visual inspection, and, together with the piping and safety devices, examined and tested under working conditions.

**3.5.2** The fuel oil, lubricating oil, hydraulic oil, thermal oil, and feed and cooling water systems, together with pressure filters, heaters and coolers used for essential services, are to be opened up and examined or tested, as considered necessary by the Surveyor. Safety devices for the foregoing items are to be examined.

**3.5.3** The compressed air system together with its valves, fittings and safety devices is to be examined, as considered necessary by the Surveyor.

**3.5.4** Compressed air receivers and other pressure vessels for essential services are to be cleaned internally and examined internally and externally. Their fittings, valves and safety devices are to be opened up, as deemed necessary by the Surveyor, for visual inspection and pressure tested as appropriate.

#### 3.5.5

For steel pipes for steam reference is to be made to the Rules for the Classification of Ships.

**3.5.6** Non-structural tanks located in machinery spaces are to be externally examined; the relevant fittings, with particular regard to the remote control shut-off valves under hydrostatic head, are to be externally examined to check the efficiency of manoeuvres and the absence of cracks or leakage.

**3.5.7** When the ship is equipped with a refrigerating plant (whether or not covered by an additional class notation), the class renewal survey is to include the examination and test at the design pressure of the parts of the plant under pressure.

Additionally, surveys requirements in Part A, Ch 5, Sec 8 of the Rules for the Classification of Ships apply to the refrigerating installations related to preservation of ship's domestic victuals and to air conditioning of accommodation spaces including pertaining service spaces and control stations as well as garbage rooms.

### 3.6 Electrical equipment and installations

**3.6.1** An electrical insulation resistance test is to be performed on the electrical equipment and cables. If needed, for the purpose of this test, the installation may be subdivided or equipment which may be damaged disconnected.

**3.6.2** The prime movers of generators are to be surveyed in accordance with Sec 3, [3.2] and their governors tested. All generators are to be presented for inspection, clean and with covers opened and examined under working conditions.

**3.6.3** Main and emergency switchboards, section boards and distribution boards are to be cleaned and doors or cov-

ers opened for examination of their fittings. The condition of overcurrent protective devices and fuses is to be checked. Circuit-breakers of generators are to be tested, as far as practicable, to verify that protective devices including preference tripping relays, if fitted, operate satisfactorily. The tightening of busbar connections is to be checked.

**3.6.4** Electrical cables and cable runs are to be examined at random, in particular in places where deterioration is likely to occur; terminal boxes of essential services are also to be subjected to a random check.

**3.6.5** The motors and starters concerning essential services together with associated control and switchgear are to be examined and, if considered necessary by the Surveyor, checked, as far as practicable, under working conditions.

**3.6.6** Navigation light indicators are to be tested under working conditions, and correct operation on the failure of supply or failure of navigation lights verified.

**3.6.7** The emergency sources of electrical power, their automatic arrangements and associated circuits are to be tested.

**3.6.8** Emergency lighting, transitional emergency lighting, supplementary emergency lighting, general emergency alarm and public address systems are to be tested as far as practicable.

**3.6.9** The visible condition of electrical equipment and installations is also to be checked as regards precautions against shock, fire and other hazards of electrical origin.

**3.6.10** A general examination of the electrical equipment in areas where there may be flammable gas or vapour and/or combustible dust is to be carried out to ensure that the integrity of the electrical equipment of a safety type has not been impaired owing to corrosion, missing bolts, etc., and that there is not an excessive build-up of dust on or in dust-protected electrical equipment. Cable runs are to be examined for sheath and armouring defects, where practicable, and to ensure that the means of supporting the cables are in satisfactory condition. The proper condition of bonding straps for the control of static electricity is to be checked. Alarms and interlocks associated with pressurised equipment or spaces are to be tested for correct operation.

Note 1: Owners are reminded that maintenance, repairs or renewal of certified electrical equipment of a safe type remains their responsibility or that of their representatives.

### 3.7 Controls

**3.7.1** Where remote and/or automatic controls, not covered by an additional class notation related to automated installation, are fitted for essential machinery, they are to be tested to demonstrate that they are in satisfactory condition.

### 3.8 Fire protection, detection and extinction

**3.8.1** The Owner or his representative is to declare to the attending Surveyor that no significant changes have been made to the arrangement of structural fire protection.

Note 1: Attention is drawn to the provisions of Ch 1, Sec 1, [3.1.1] regarding compliance with any additional and/or more stringent requirements issued by the Naval Authority.

**3.8.2** The class renewal survey of fire prevention arrangements is to cover the following items.

- a) Visible parts of items forming part of structural fire protection arrangements in accommodation spaces and in machinery spaces such as bulkheads, decks, doors, stairways, crew and service lift trunks, and light and air trunks are to be examined, due attention being given to their integrity and that of the insulating material.
- b) The operation of manual/automatic fire doors, where fitted, is to be checked.
- c) Remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces and, where fitted, remote controls for stopping fans in accommodation spaces and means of cutting off power to the galley are to be tested.
- d) Closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnels, where applicable, are to be tested.
- e) Fire and/or smoke detection and alarm systems are to be tested.

### 3.8.3

The survey requirements for all types of fire-fighting systems that are usually found on board ships related either to machinery spaces or to cargo areas and/or spaces or to accommodation spaces, irrespective of the service notation assigned, are the following:

- a) water fire system
  - the associated pumps are to be opened up and examined at the Surveyor's discretion
  - the fire main is to be hydrostatically tested to the working pressure at the Surveyor's discretion
- b) fixed gas fire-extinguishing system
 

Receivers of CO<sub>2</sub> (or other gas) fixed fire-extinguishing systems are to be externally examined together with all stationary fittings and devices. In addition, the following applies:

- the total loss of CO<sub>2</sub> is not to exceed 10% of the installed quantity
- after being repaired or discharged, containers are to be subjected to a hydrostatic test
- hydrostatic testing of high pressure CO<sub>2</sub> containers is to be carried out on alternate class renewal surveys (starting from the 2<sup>nd</sup>, i.e.: at the 2<sup>nd</sup>, 4<sup>th</sup>, etc.); the number of the tested containers is to be not less than 10% of the total number.

It is to be checked that the distribution pipework is proved clear.

- c) water mist system
  - the associated pumps are to be opened up and examined at the Surveyor's discretion
- d) water-spraying system
  - the associated pumps are to be opened up and examined at the Surveyor's discretion
  - a working test is to be carried out as far as reasonable and appropriate
- e) fixed foam systems (low or high expansion)
  - the associated pumps are to be opened up and examined at the Surveyor's discretion
- f) dry powder system
  - it is to be verified that the propelling compressed air bottles have been hydrostatically tested. The same applies to bottles disembarked for refilling or embarked for replacement.

**3.8.4** As far as other fire-fighting equipment is concerned, the following items are to be hydrostatically tested :

- shells of water and foam extinguishers
- shells of powder extinguishers
- air or gas bottles associated with fire extinguishers whose shells are not kept under pressure (if internally examined, the test need not be performed).

As far as concerns the bottles of extinguishers containing either CO<sub>2</sub> or powder with shell kept under pressure, they are to be hydrostatically tested whenever they are found empty or low charged (less than 90% for CO<sub>2</sub> and with low pressure for powder extinguishers).



## SECTION 5

## BOTTOM SURVEY

### 1 General

#### 1.1

**1.1.1** The bottom survey may be carried out in dry condition, such as in dry dock or on a slipway, or through an in-water survey.

The conditions for acceptance of a bottom in-water survey in lieu of a bottom survey in dry condition are laid down in Ch 2, Sec 2, [7.1] Sec 4, [3.1].

### 2 Bottom survey in dry condition

#### 2.1 General requirements

##### 2.1.1

When a ship is in dry condition, it is to be placed on blocks of sufficient height and with the necessary staging to permit the examination of elements such as shell plating including bottom and bow plating, stern frame and rudder, sea chests and valves, propeller, etc.

##### 2.1.2

The outer shell plating is to be visually examined for excessive corrosion, or deterioration due to chafing or contact with the ground or for any undue deformation or buckling. Due attention is to be given to the plating of end structures (stem and sternframe), and to the connection between the bilge strakes and the bilge keels. Important plate unfairness or other deterioration which do not necessitate immediate repairs are to be recorded.

##### 2.1.3

Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need not be opened up more than once in a class renewal survey period unless considered necessary by the Surveyor.

##### 2.1.4 (1/1/2017)

Visible parts of the propeller(s), stern bush(es), propeller shaft boss, brackets and tightness system(s) are to be examined. The clearances of the propeller shaft(s) (or wear down gauge) are to be checked and recorded. For controllable pitch propellers, the Surveyor is to be satisfied with the fastenings and tightness of hub and blade sealing.

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

Dismantling is to be carried out, if considered necessary, notably where leakages are detected.

##### 2.1.5

Visible parts of the rudder(s), rudder pintles, rudder stock and couplings as well as the sternframe are to be examined. If considered necessary by the Surveyor, the rudder(s) is (are) to be lifted or the inspection plates removed for the examination of pintles.

The clearances in the rudder bearings and the rudder lowering are to be checked and recorded.

Where applicable, pressure test of the rudder may be required as deemed necessary by the Surveyor.

#### 2.2 Bottom survey held within the scope of class renewal survey

**2.2.1** The bottom survey held within the scope of the class renewal survey is to be carried out in compliance with Sec 4, [1.1]

### 3 Bottom in-water survey

#### 3.1 General

**3.1.1** An in-water survey may normally be carried out if the ship has been granted the additional class notation **INWATERSURVEY** as defined in. Upon application by the Owner and in special circumstances, the Society may also authorise such bottom in-water survey for ships not assigned with the additional class notation **INWATERSURVEY**.

##### 3.1.2

The bottom in-water survey is to provide the information normally obtained from a bottom survey carried out in dry condition, and the scope of the in-water survey is the same as detailed in Sec 4, [2.1], so far as practicable. Proposals for in-water surveys are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Society.

In principle, no outstanding recommendations are to exist requiring repair work to be carried out to the underwater part of the shell plating, the rudder, the propeller or the propeller shaft, unless the Society is satisfied that such repairs may be carried out while the ship is afloat.

##### 3.1.3 (1/1/2017)

The in-water survey is to be carried out with the ship in sheltered water and preferably with weak tidal streams and currents. The in-water visibility and the cleanliness of the hull below the waterline are to be good enough to permit a meaningful examination which allows the Surveyor and diver to determine the condition of the plating, appendages and welding.

The Society is to be satisfied with the methods of localisation of the divers on the plating, which should make use

where necessary of permanent markings on the plating at selected points.

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

**3.1.4**

The in-water survey is to be carried out by one or more professional divers in the presence of a Surveyor. The diver(s) is (are) to be employed by a firm agreed by the Society

For the agreement of such firms, refer to Ch 2, Sec 2, [2.4].

**3.1.5**

The Surveyor is to be satisfied with the method of pictorial representation, and a good two-way communication between the Surveyor and divers is to be provided.

**3.1.6** If the in-water survey reveals damage or deterioration that requires early attention, the Surveyor may require the ship to be drydocked in order for a detailed survey to be undertaken and the necessary repairs carried out.

## SECTION 6

## SHAFT SURVEY

### 1 Survey of shafts

#### 1.1 General

##### 1.1.1 (1/1/2017)

The different types of surveys to which shafts may be subjected

- Method 1, Method 2 or Method 3 for oil lubricated or Closed Loop System Fresh Water Lubricated Shafts
- Method 4 for shafts lubricated by water in an open loop system

and the intervals at which they are to be carried out are given in Ch 2, Sec 2, [8].

For ships, delivered before 1st January 2016, the scheduled survey due after 1st January 2016 may still be carried out by applying the scheme of survey in force till 31st December 2015. The different types of surveys to which their shafts may be subjected are:

- complete survey
- modified survey.

#### 1.2 METHOD 1

##### 1.2.1 (1/1/2017)

The survey is to consist of:

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

#### 1.3 METHOD 2

##### 1.3.1 (1/1/2017)

The survey is to consist of:

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

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

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

#### 1.4 METHOD 3

##### 1.4.1 (1/1/2017)

The survey is to consist of:

- checking and recording the bearing wear down measurements;
- visual inspection of all accessible parts of the shafting system;

- c) verification that the propeller is free of damage which may cause the propeller to be out of balance;
- d) seal liner found to be or placed in a satisfactory condition;
- e) verification of the satisfactory conditions of inboard and outboard seals.

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

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

## 1.5 METHOD 4

### 1.5.1 (1/1/2017)

The survey is to consist of:

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

## 1.6 Extension surveys

### 1.6.1 Extension up to 2.5 years for oil lubricated shafts or closed loop system fresh water lubricated shafts (1/1/2017)

The survey is to consist of:

- a) checking and recording the bearing wear down measurements, as far as practicable;

- b) visual inspection of all accessible parts of the shafting system;
- c) verification that the propeller is free of damage which may cause the propeller to be out of balance;
- d) verification of the effectiveness of the inboard seal and outboard seals.

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

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

### 1.6.2 Extension up to 1 year for oil lubricated shafts or closed loop system fresh water lubricated shafts (1/1/2017)

The survey is to consist of:

- a) visual inspection of all accessible parts of the shafting system;
- b) verification that the propeller is free of damage which may cause the propeller to be out of balance;
- c) verification of the effectiveness of the inboard seal and outboard seals.

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

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

### 1.6.3 Extension up to 3 months for oil lubricated shafts or closed loop system fresh water lubricated shafts (1/1/2017)

The survey is to consist of:

- a) visual inspection of all accessible parts of the shafting system;
- b) verification of the effectiveness of the inboard seal.

Pre-requisites to satisfactorily verify in order to apply extension up to 3 months:

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

#### **1.6.4 Extension up to 1 year for water lubricated shafts (open loop systems) (1/1/2017)**

The survey is to consist of:

- a) visual inspection of all accessible parts of the shafting system;
- b) verification that the propeller is free of damage which may cause the propeller to be out of balance;
- c) checking and recording the bearing clearances;
- d) verification of the effectiveness of the inboard seal.

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

- review of the previous clearance recordings;
- review of service records;
- verification of no reported repairs by grinding or welding of shaft and/or propeller;
- confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

#### **1.6.5 Extension up to 3 months for water lubricated shafts (open loop systems) (1/1/2017)**

The survey is to consist of:

- a) visual inspection of all accessible parts of the shafting system;
- b) verification that the propeller is free of damage which may cause the propeller to be out of balance;
- c) verification of the effectiveness of the inboard seal.

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

- review of the previous clearance recordings;
- review of service records;
- verification of no reported repairs by grinding or welding of shaft and/or propeller;
- confirmation from the Chief Engineer that the shafting arrangement is in good working condition.

## **1.7 Complete survey**

### **1.7.1**

The complete survey of tailshafts consists of the following, as applicable:

- a) removal of propeller and key, where fitted, from tapered shafts and their examination
- b) complete withdrawal of shaft to permit the examination of stern tube bearings (outboard or inboard depending on the type of shaft)
- c) examination by an appropriate crack detection method of the after end of the cylindrical part of the shaft and forward one third of shaft cone, or the fillet of the flange in the case of a flanged coupling
- d) examination of shaft bearing surfaces, liners, joints, threaded end and nut
- e) examination of oil sealing glands with the necessary dismantling
- f) measurements of clearances and/or wear and tear (prior to and after the survey) and their recording

**1.7.2** The tailshaft need not to be withdrawn at the complete survey when the shaft is made of corrosion resistant material or is protected by corrosion resistant metallic liners or cladding in way of bearings, the bearings are made of a specially approved material e.g. according to MIL-B-17901B(SH), and the wear of shaft and bearing can be measured with the shaft in place.

### **1.7.3**

Where the notation **MON-SHAFT** or **MON-SHAFT-WATER** has been assigned as specified in Ch 2, Sec 2, [8.5.1], the tailshaft need not be withdrawn at the complete survey and items b) and d) of Sec 5, [1.2.1] need not be covered provided that all condition monitoring data is found to be within permissible limits and the remaining requirements for the complete survey are complied with.

Where the Surveyor considers that the data presented is not entirely to his satisfaction, the shaft is to be withdrawn.

## **1.8 Modified survey**

**1.8.1** A modified survey may be carried out for those tailshafts which fulfil the conditions described in Ch 2, Sec 2, [8.4.1], where the periodicity of this type of survey is also shown.

**1.8.2** The modified survey for all types of shafts consists of the following:

- check of oil sealing glands in place
- measurements of wear and their recording
- examination of the results of stern tube lubricating oil analyses, to confirm they have been regularly performed and the recorded parameters are within acceptable limits
- check of the records of lubricating oil consumption, to confirm it is within permissible limits.

In addition, for the different types of shafts, the following is required:

- a) for shafts with keyed propeller coupling:
  - removal of propeller and key, and their examination in way of the connection area
  - examination by an appropriate crack detection method of the after end of the cylindrical part of shaft and forward one third of shaft cone
- b) for shafts with keyless type propeller coupling:
  - check of the tightness of the propeller hub (propeller hood, fore gland)
- c) for shafts with a solid flange coupling at the aft end and variable pitch propeller:
  - check of tightness in way of blade glands and distribution box
  - check of analysis of hydraulic oil
  - working test, as far as practicable, of the blade manoeuvring.

**1.8.3** Where the Surveyor considers that the data presented is not entirely to his satisfaction, further dismantling may be required, including withdrawal of the tailshaft.

## 2 Periodical survey of other propulsion systems

### 2.1 Rotating and azimuth thrusters

**2.1.1** The periodical survey of rotating and azimuth thrusters consists of:

- a) removing the propeller(s) in order to examine the following items, as applicable:
  - exposed parts
  - cone and keyway to be checked by an appropriate crack detection method
  - sealing glands

- threaded end and nut

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

c) examining the orientation device.

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

### 2.2 Vertical axis propellers

**2.2.1** The periodical survey of vertical axis propeller systems consists of:

- checking the tightness of the oil glands and the backlash of the gears from outside by action on the blades
- checking the condition of gears and couplings from inside the ship
- examining the results of a lubricating oil analysis (water content and presence of material particles) to detect possible deterioration of internal gears and bearings.

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

### 2.3 Pump jet systems

**2.3.1** The periodical survey of pump jet systems consists of examining the following parts:

- impeller, shaft and clearances of bearings
- tightness of gland
- water duct
- steering nozzle
- reversing arrangements and control gear.

If the foregoing checks are not satisfactory, further dismantling may be required.

## APPENDIX 1

# CLASS REQUIREMENTS AND SURVEYS OF LAID-UP SHIPS

## 1 General

### 1.1

**1.1.1** In order to maintain its class during a normal operation period, a ship is to be submitted to the surveys described in Ch 2, Sec 2 at their due dates and to the satisfaction of the Society, and is to be free of overdue surveys and conditions of class during the considered period.

**1.1.2** When a ship stops trading and is put out of commission for a certain period, i.e. is laid-up, the normal survey requirements may no longer apply provided that the Owner notifies the Society of this fact. The Owner is also to submit a lay-up maintenance program to the Society for approval.

**1.1.3** The lay-up maintenance program includes:

- the safety conditions to be kept throughout the lay-up period
- the measures taken to preserve the maintenance of the ship throughout the lay-up period
- the survey requirements to be complied with for lay-up, maintenance of class in lay-up and re-commissioning.

## 2 Safety conditions

### 2.1

#### 2.1.1 Power supply

Adequate power supply is to be supplied, or readily available, all around the clock, either from independent means on board the ship or from shore.

The following safety conditions are to be kept throughout the lay-up period.

#### 2.1.2 Manning

Watch personnel are to be provided. The number of the watch personnel will depend on the size of the ship, the lay-up site and mooring arrangements, the shore assistance available in case of fire, leakage or flooding, the maintenance required to provide adequate preservation. A permanent shore communication installation (radio, telephone) is also to be available.

#### 2.1.3 Fire protection and fire fighting

The following is to be complied with:

- automatic fire alarm systems, where provided, are to be in working order and in operation
- fire-fighting installations are to be tested regularly and readily available
- the fire main is to be readily available and periodically tested under pressure
- ventilation trunks, air inlets and watertight doors are to be kept closed.

#### 2.1.4 Protection against explosion

Cargo spaces and piping systems are to be cleaned and ventilated to prevent gas from forming any pockets.

An inert gas system in operation is recommended for the cargo spaces of oil and chemical tankers.

All flammable materials, sludge, etc. are to be removed from the ship's bilge, tank tops, double bottom tanks, engine room, pump rooms and similar spaces.

Hot work is not to be carried out during lay-up, unless special precautionary measures are taken.

#### 2.1.5 Safety equipment

All the equipment usually recommended for the safety of the watch personnel is to be provided, kept in working order and tested regularly.

The usual life-saving equipment such as liferafts, life-buoys, breathing apparatus, oxygen masks and distress signals is to be provided and made accessible.

The requirements of the flag Administration and of the local port authorities of the lay-up site are usually to be applied.

#### 2.1.6 Emergency power

The emergency source of power, emergency generator and/or emergency air compressor are to be kept in working order and tested weekly.

## 3 Preservation measures for lay-up and maintenance

### 3.1 General

**3.1.1** A lay-up log-book is to be kept on board, in which the maintenance work and tests carried out during the lay-up period are to be entered with the corresponding dates. The nature and frequency of the maintenance, inspections and tests are also to be defined in the lay-up log book.

**3.1.2** The following measures for preservation and maintenance during the lay-up period are to be taken by Owners according to the type of ship, hull equipment, machinery installations and the specific cases of lay-up conditions.

## 3.2 Exposed parts of the hull

**3.2.1** Underwater parts of the hull are to be protected against corrosion. It is advisable to provide an impressed current cathodic protection system where the quantity of corrosive waste discharge is particularly high. When such systems are provided they are to be serviced and checked at regular intervals. The condition of sacrificial anodes is to be evaluated at the annual lay-up condition surveys.

**3.2.2** The coating of the hull above the waterline, exposed decks, access doors or covers on exposed decks, and hatch covers is to be maintained in satisfactory condition.

All accesses leading to internal spaces are to be kept closed.

All vent pipes and ventilation trunks are to be kept closed.

## 3.3 Internal spaces

**3.3.1** Cargo tanks and cargo holds are to be emptied, cleaned and kept dry.

Ballast tanks are to be kept either full or empty. When ballast spaces are kept filled with sea water, special care is to be taken to keep such spaces topped up and protected against corrosion. When provided, sacrificial anodes are to be renewed when deemed necessary. The topping up is to be regularly verified.

**3.3.2** Chain lockers are to be drained, cleaned and kept dry. Coating with bituminous paint is recommended.

**3.3.3** Fuel oil and lubricating oil tanks are to be drained regularly.

Lubricating oil analysis is to be performed regularly and the oil renewed when the result is not satisfactory. Prior to being refilled, tanks are to be cleaned.

Empty lubricating oil tanks are to be cleaned and kept dry.

Fresh water or distilled water tanks are to be kept full or empty. Empty tanks are to be cleaned and kept dry. Where cement wash is used as a coating, this is to be examined and, if necessary, repaired prior to filling.

**3.3.4** The bilge and tank top in engine rooms are to be cleaned and kept dry.

Hull sea inlet and outlet valves not in use are to be kept closed.

## 3.4 Deck fittings

**3.4.1** The windlass, capstans and winches are to be regularly greased and turned once a week.

All wire cables are to be kept greased.

Visible parts of chains are to be coal-tarred and examined regularly.

Chocks and hawse pipes are to be coated with bituminous paint or equivalent if deemed necessary.

Cargo piping on deck is to be drained, blown through if deemed necessary and kept dry by opening up drains.

Electrical machinery and navigational equipment are to be protected by watertight covers.

## 3.5 Machinery

### 3.5.1 Machinery spaces

The air temperature inside the machinery spaces is normally to be kept above 0°C.

Humidity is to be kept as low as possible and within acceptable limits.

### 3.5.2 Machinery - General

Exposed mechanical parts of machinery are to be greased.

All rotating machinery such as diesel engines, reciprocating engines, pumps, turbines, electric motors and generators are to be turned at regular intervals with a limited number of revolutions (the lubricating oil system should be put in operation or proper priming applied). Units are not to be stopped in the same position as the previous one.

Bearing boxes are to be emptied, cleaned and refilled with new oil.

### 3.5.3 Main turbines

Turbines are to be kept dry.

All steam inlets are to be sealed.

Expansion arrangements (sliding feet) are to be suitably greased.

Electric heaters are to be put inside the turbines. Heat drying is to be made in open circuit, all valves shut and gland closing devices withdrawn.

Turbines are to be turned weekly, the lubricating oil system being put in service. The shaft line is to be stopped after turning an integer number of revolutions plus one quarter of a revolution.

### 3.5.4 Reduction gears

For large reduction gears, a fan activating the circulation of hot air in closed circuit with air hoses is to be fitted (intake at lower part of casing and discharge at upper part).

### 3.5.5 Auxiliary turbine-driven machinery

Stators are to be drained and kept dry.

Shaft sealing glands are to be lubricated.

Lubricating oil is to be analysed and renewed when deemed necessary. Prior to oil renewal, the oil casings are to be cleaned.

Exhaust steam pipes are to be kept dry.

Stuffing boxes are to be dismantled.

Turbines are to be turned weekly an integer number of revolutions plus one quarter of a revolution.



### 3.5.6 Condensers and heat exchangers

Condensers and heat exchangers are to be drained and kept dry.

Desiccant is to be placed in steam spaces.

Water sides are to be washed with fresh water.

The condition of the zinc anodes is to be periodically checked.

When tubes are fitted with plastic or fibre packing, water sides are to be filled with alkaline distilled water.

When tubes are expanded or fitted with metal packing, water sides are to be provided with desiccants and kept dry.

### 3.5.7 Auxiliary machinery

Air receivers are to be drained, opened up and cleaned. Pressure relief valves are to be cleaned and slightly lubricated.

Air compressor crankcases are to be drained, cleaned and refilled with clean oil. Cylinders and valves are to be lubricated. Coolers are to be drained and dried. Air drains are to be opened and the system dried.

Air start lines are to be drained and dried.

Hot-wells/return tanks are to be drained and dried.

De-aerators are to be drained and dried.

Feed pumps and extraction pumps are to be drained and dried.

Air ejectors are to be drained and dried.

Main circulation pumps are to be drained and dried.

Evaporators are to be drained, cleaned and dried.

### 3.5.8 Piping

Pipes not in use are to be drained and kept dry.

### 3.5.9 Diesel engines

Daily tank fuel oil outlet pipes and all injection equipment are to be filled with filtered gas oil.

Fresh water circuits are to be filled with water mixed with rust inhibitors. Fresh water pH is to be checked monthly.

Oil of hydraulic regulators is to be replaced.

Sea water cooling pipes are to be drained.

Crankcases are to be provided with desiccant.

Starting valves are to be lubricated (internally and externally).

Motor oil is to be sprayed in cylinders and on all external parts liable to corrosion.

Cams and cylinders are to be motor oil sprayed monthly.

Turbo-compressor/charger ball bearings are to be oil sprayed and rotated for an integer number of revolutions plus one quarter of a revolution.

Engine air inlets and exhaust gas pipes are to be sealed.

Scavenge spaces are to be cleaned

Engines are to be turned weekly.

### 3.5.10 Shaft lines

Shaft lines are to be coated with grease.

Shaft bearing cooling pipes are to be drained.

For sea water lubricated propeller shafts, the packing gland of the engine room stuffing box is to be tightened.

For oil lubricated stern tubes, lubricating oil is to be analysed and renewed if not satisfactory. The oil level in the tank is to be verified regularly.

Propeller shaft lines are to be rotated an integer number of revolutions plus one quarter of a revolution.

## 3.6 Electrical installations

**3.6.1** Main and secondary switchboards, sub-feeder panels, fuse panels and starters are to be made tight. Desiccant is to be provided.

Contacts of relays, breakers and switch-breakers are to be coated with neutral vaseline.

Bearings of generators are to be cleaned of old grease and protected with new oil or grease.

Carbon brushes are to be lifted off their commutations.

**3.6.2** Electrical insulation of each item is to be kept at a minimum 200,000 Ohms and general insulation is to be not less than 50,000 Ohms. Local electric heating may be necessary to improve the level of insulation, particularly in the generators/alternators and large motors.

A megger test is to be performed regularly.

## 3.7 Steering gear

**3.7.1** Exposed mechanical parts are to be greased or oil sprayed.

For electrical parts the same preservation measures given in [3.6] are to be taken.

It is recommended that the steering gear should be operated monthly.

## 3.8 Boilers

**3.8.1** (

For boilers reference is to be made to the Rules for the Rules for the Classification of Ships.

## 3.9 Automation equipment

**3.9.1** Recommendations for electronic components are the same as those given for electrical installations.

For pneumatic parts the manufacturers' recommendations are to be followed and the system is to be checked regularly.

Pressure, temperature or level sensors are generally not affected by damage when not used. However, when available, the manufacturers' recommendations are to be followed.

## 4 Lay-up site and mooring arrangements

### 4.1 General

**4.1.1** The choice and suitability of the lay-up site, as well as the type of mooring conditions, the mooring arrange-

ments and their efficiency during the lay-up period remain the responsibility of the Owner.

However, at the Owner's request, the mooring arrangement may be reviewed by the Society.

## 4.2 Recommendations for the lay-up site

**4.2.1** The following recommendations are to be considered by Owners regarding the choice and suitability of the lay-up site.

The site should be:

- sheltered from open sea, strong currents and waves
- not exposed to whirling winds or turbulent tidal waves
- not exposed to moving ice
- clear of corrosive waste waters
- provided with adequate ship/shore communications.

## 4.3 Recommendations for the mooring arrangements

**4.3.1** The following recommendations are to be considered by Owners with respect to the mooring arrangements:

- ground holding should be adequate
- vessels laid-up to buoys or anchored should be moored in such a way as to be prevented from swinging with normal wind and tidal changes
- chain cables should not be subject to cross-contact or twisting and stern anchorage should generally be provided
- laid-up ships should be in ballast condition in order to reduce the effects of wind. Due consideration should be given to the still water bending moment. For guidance, normal ballast draft should be roughly between 30% and 50% of the maximum draft.

**4.3.2** Ships should normally be moored singly. However, when several ships are moored together, the following provisions are to be made:

- ships are to be moored bow to stern
- ships are to be of approximately the same size
- the number of ships moored together is, in principle, not to exceed six
- breast-lines are to be of similar elasticity
- fenders are to be provided.

## 4.4 Review of the mooring arrangements

**4.4.1** As indicated in [4.1.1], at the Owners' request, the mooring arrangements may be reviewed by the Society.

**4.4.2** The proposal for the mooring arrangements is in such case to be submitted by the Owner and is to include the following information.

a) Mooring site:

- geographical area (to be specified on a map)
- characteristics of the sea bottom
- water depth
- preferential angular sectors (effects of wind / tide / current) indicated according to statistical studies
- wave characteristics (amplitude, periods)

b) Geometry of mooring arrangements:

- ship's position and direction
- shore anchorage
- diagram showing mooring equipment (fore and aft)
- angle between chain cables and ship's centreline

c) Characteristics of mooring equipment:

- maximum holding strength of each anchor
- type of mooring lines (chains, cables, sinkers, etc.)
- length of each section
- weight of each section
- mechanical characteristics of each section (breaking load)
- weight of sinkers.

**4.4.3** On completion of the installation, the mooring arrangements are to be inspected by the Society. When the ship is anchored, the underwater installation is to be inspected by a diver whose report is to be presented to the Society.

**4.4.4** It is the responsibility of the Owners to ascertain the efficiency of the mooring arrangements during the lay-up period. The mooring arrangements are to be re-examined at regular intervals (at least each year when the ship is anchored) and when abnormal weather conditions occur at the lay-up site.

## 5 Surveys

### 5.1 Laying-up survey

**5.1.1** At the beginning of the lay-up period a laying-up survey is to be carried out whose scope is to verify that the safety conditions, preservation measures, lay-up site and mooring arrangements are in accordance with the program agreed by the Society.

**5.1.2** Upon satisfactory completion of this survey, an endorsement to confirm that the ship has been placed in lay-up is entered on the Certificate of Classification, which is subsequently to be kept on board.

### 5.2 Annual lay-up condition survey

**5.2.1** As described in Ch 2, Sec 2, [13], an annual lay-up condition survey is to be performed in lieu of the normal annual class surveys. The purpose of this survey is to ascertain that the lay-up maintenance program implemented is continuously complied with.

**5.2.2** It is to be checked that the arrangements made for the lay-up are unchanged and that the maintenance work

and tests are carried out in accordance with the maintenance manual and recorded in the lay-up log-book.

**5.2.3** Upon satisfactory completion of the survey, the Certificate of Classification is endorsed.

### 5.3 Re-commissioning survey

**5.3.1** Owners are to make the necessary arrangements to remove the temporary lay-up installations provided for preservation measures and the protective materials and coatings (oil, grease, inhibitors, desiccants), before the survey is commenced.

It is the Owners' responsibility to verify that the ship parts that are not covered by class are reactivated in satisfactory operational condition.

#### 5.3.2 (1/1/2017)

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

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

In all cases where the Owner elects to carry out the "next due" renewal survey, the due periodical hull and machinery surveys, due or which become overdue during the lay-up period, will be replaced by this one.

**5.3.3** For the hull the following is to be carried out:

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

**5.3.4** For the deck fittings the following is to be carried out:

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

**5.3.5** For machinery installations the following is to be checked:

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

**5.3.6** The main and emergency electrical installations are to be tested. The parallel shedding of main generators and main switchboard safety devices are to be checked. A megger test of the electrical installation is to be performed.

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

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

**5.3.8** The automated installation is to be checked for proper operation.

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

**5.3.10** For other specific classed installations, the Owners are to submit a survey program to the Society.

**5.3.11** On completion of the above surveys and tests, sea trials are to be performed in the presence of a Surveyor of the Society.

The sea trials are to include :

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

**5.3.12** Upon satisfactory completion of the surveys, an endorsement to confirm the carrying out of all relevant surveys and the re-commissioning of the ship is entered on the Certificate of Classification.

Part A  
**Classification and Surveys**

Chapter 4

**SCOPE OF SURVEYS IN RESPECT OF THE  
DIFFERENT SERVICES OF SHIPS**

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**SECTION 1      GENERAL**

**SECTION 2      AIRCRAFT CARRIER AND/OR HELICOPTER CARRIER**

**SECTION 3      SUPPLY SHIP**



# SECTION 1

# GENERAL

## 1 General

### 1.1

**1.1.1** The purpose of this Chapter is to give details on the scope of surveys of certain ships which, due to the service notation assigned and related equipment, need specific requirements to be verified for the maintenance of their class.

**1.1.2** These specific requirements either are additional to or supersede those stipulated in Chapter 3, which gives general requirements for surveys applicable to all types of ships: this is indicated in each Section of this Chapter. These surveys are to be carried out at intervals as described in Ch 2, Sec 2, concurrently with the surveys of the same type, i.e. annual, intermediate or class renewal surveys, detailed in Chapter 3.

**1.1.3** Where specific requirements are given in this Chapter for the class renewal survey, they are additional to the applicable requirements for the annual survey.

## 2 Service notations subject to additional surveys

### 2.1

**2.1.1** The specific requirements detailed in this Chapter are linked to the service notation(s) assigned to the ship at the request of the Owner. Where a ship has more than one service notation, the specific requirements linked to each one are applicable, insofar as they are not contradictory (in such case, the most stringent requirement will be applied).

**2.1.2** Tab 1 indicates which service notations are subject to specific requirements, and in which Section or Article they are specified.

**Table 1 : Service notations for which specific requirements are applicable**

Service notation assigned	Section or Article applicable in this Chapter	Type of surveys affected by these specific requirements	Remarks
- aircraft carrier - helicopter carrier	Sec 2	annual survey class renewal survey	
- supply ship	Sec 3	annual survey intermediate survey class renewal survey	

## SECTION 2

# AIRCRAFT CARRIER AND/OR HELICOPTER CARRIER

### 1 General

#### 1.1

**1.1.1** The requirements of this Section are applicable after construction to all ships which have been assigned one of the following service notations:

- **aircraft carrier**
- **helicopter carrier**
- both the above.

**1.1.2** These requirements are additional to those laid down in Chapter 3, according to the relevant surveys.

### 2 Annual survey

#### 2.1 Fire protection, detection and extinction

**2.1.1** Within the scope of survey of fire protection, detection and extinction arrangements as required for the annual survey of all ships in Ch 3, Sec 1, [3.4], attention is to be given to the particular arrangements related to vehicle spaces, ro-ro vehicle spaces and hangar, helicopter deck and/or aircraft deck, such as:

- fire detection systems and alarms
- fixed fire-extinguishing arrangements (gas, water-spraying or foam systems)
- portable fire extinguishers in spaces and at entrances
- ventilation and related safety devices (including remote control on the bridge), and
- electrical equipment of a safe type.

### 3 Class renewal survey

#### 3.1 Shell and inner doors

**3.1.1** A close visual inspection of structural arrangements is to be carried out, supplemented by non-destructive tests and/or thickness measurements, as deemed necessary by the Surveyor.

**3.1.2** The close visual inspection of securing, supporting and locking devices, as required for the annual survey, is to be supplemented by non-destructive tests and/or thickness measurements.

**3.1.3** Clearances of hinges, bearings and thrust bearings are to be measured. Dismantling may be required as deemed necessary by the Surveyor.

**3.1.4** Non-return valves of drainage arrangements are to be checked after dismantling.

#### 3.2 Internal platforms and ramps

**3.2.1** The condition of pulleys, axles, cables and structure of the platforms and ramps, if any, is to be checked.

Electric motors and/or hydraulically operated equipment are to be surveyed according to the scope detailed in Ch 3, Sec 3, [3] for the class renewal survey of machinery installations.

#### 3.3 Fire protection, detection and extinction

**3.3.1** Within the scope of survey of fire protection, detection and extinction arrangements as required for the class renewal survey of all ships in Ch 3, Sec 3, [3.8], attention is to be given to the particular arrangements related to vehicle spaces, ro-ro vehicle spaces and hangar, helicopter deck and/or aircraft deck, such as those indicated in [2.1.1].

## SECTION 3

## SUPPLY SHIP

### 1 General

#### 1.1

**1.1.1** The requirements of this Section are applicable after construction to all ships which have been assigned the service notation **supply ship**.

### 2 Annual survey - Hull items

#### 2.1 Weather decks

**2.1.1** The survey is to include:

- examination of oil product and JP5-NATO(F44) tank openings, including gaskets, covers, coamings and screens
- examination of oil product and JP5-NATO(F44) tank pressure/vacuum valves and flame screens
- examination of flame screens on vents to all bunker, oily ballast and oily slop tanks
- examination of oil product and JP5-NATO(F44), bunker, ballast and vent piping systems, including remote control valves, safety valves and various safety devices, as well as vent masts and headers
- confirmation that pumps, valves and pipelines are identified and distinctively marked.

#### 2.2 Oil product and JP5-NATO(F44) pump rooms and pipe tunnels

**2.2.1** The survey is to include:

- examination of all pump room bulkheads and pipe tunnels (if any) for signs of oil product or JP5-NATO(F44) leakage or fractures and, in particular, if any, the sealing arrangements of penetrations in pump room bulkheads
- examination of the condition of all piping systems, in oil product and JP5-NATO(F44) pump rooms and pipe tunnels (if any)
- examination of the bilge and ballast arrangements and confirmation that pumps and pipelines are identified.

### 3 Annual Survey - Machinery items

#### 3.1 Instrumentation and safety devices

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

- examination of oil product and JP5-NATO(F44) tank gauging devices, high level alarms and valves associated with overflow control

- confirmation that installed pressure gauges on cargo discharge lines are properly operational

### 3.2 Fire-fighting systems

**3.2.1** The survey is to include:

- external examination of piping and cut-out valves of fixed fire-fighting systems related to oil product and JP5-NATO(F44) tanks and pump rooms
- confirmation, as far as practicable and when appropriate, that the remote means for closing the various openings are operable
- examination of the appropriate portable fire-extinguishing equipment for the cargoes to be carried in accordance with the relevant requirements given in Ch 3, Sec 1, [3.4.3]
- examination of fire-fighting systems of any type fitted on board such as deck foam, water-spraying etc. as applicable in accordance with the relevant requirements given in Ch 3, Sec 1, [3.4.2].

### 4 Intermediate survey

#### 4.1 Piping

**4.1.1** The survey is to include:

- examination, as far as applicable, of oil product and JP5-NATO(F44), stripping, bunker, ballast, steam and vent piping systems as well as vent masts and headers. If upon examination there is any doubt as to the condition of the piping, pressure testing, thickness measurement or both may be required.
- examination of vent line drainage arrangements.

### 5 Class renewal survey - Hull items

#### 5.1 Piping

**5.1.1** Piping for oil product or JP5-NATO(F44), ballast, stripping and venting systems is to be examined to the Surveyor's satisfaction. Dismantling and/or thickness measurements of these items may be required. A hydraulic test is to be carried out in the event of repair or dismantling of oil product or JP5-NATO(F44) or ballast piping, or where doubts arise.

Vent line drainage arrangements are to be examined.

#### 5.2 Safety valves

**5.2.1** All safety valves on oil product or JP5-NATO(F44) piping and tanks are to be dismantled for examination, adjusted and, as applicable, resealed.



### **5.3 Oil product and JP5-NATO(F44) pump rooms**

**5.3.1** All oil product or JP5-NATO(F44) pump room boundaries are to be generally examined. All gas-tight shaft sealing devices are to be examined. The bottom of oil product or JP5-NATO(F44) pump rooms is to be presented clean for the examination of stripping devices and gutters.

## **6 Class renewal survey - Machinery items**

### **6.1 Pumps**

**6.1.1** Ballast and stripping pumps are to be internally examined and prime movers checked. A working test is to be carried out.

Maintenance records of oil product or JP5-NATO(F44) pumps are to be made available to the Surveyor.

### **6.2 Remote controls**

**6.2.1** An operating test of the emergency remote control of pumps and valves and of automatic closing valves is to be carried out.

### **6.3 Fire-fighting systems**

**6.3.1** The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the oil product or JP5-NATO(F44) tank area and pump room, such as deck foam, water-spraying, dry powder systems etc., as applicable in accordance with the relevant requirements given in Ch 3, Sec 3, [3.8].

Part A  
**Classification and Surveys**

Chapter 5

**SCOPE OF SURVEYS RELATED TO ADDITIONAL  
CLASS NOTATIONS**

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- SECTION 1      GENERAL**
- SECTION 2      MILITARY NOTATION**
- SECTION 3      AUTOMATED MACHINERY SYSTEMS**
- SECTION 4      MONITORING EQUIPMENT**
- SECTION 5      OTHER NOTATIONS**



## SECTION 1

## GENERAL

### 1 General

#### 1.1

**1.1.1** The purpose of this Chapter is to give details on the scope of surveys of specific equipment and systems fitted on board the ship, which are covered by an additional class notation. Unless otherwise specified in Ch 1, Sec 2, [7], the scope of these surveys provides the requirements to be complied with for the maintenance of the relevant additional class notation.

**1.1.2** These specific requirements are additional to those laid down in Chapter 3 and Chapter 4. These surveys are to be carried out at intervals as described in Ch 2, Sec 2, as far as possible concurrently with the surveys of the same type, i.e. annual, intermediate or class renewal survey.

**1.1.3** The equipment and systems are also to be submitted to occasional survey whenever one of the cases indicated in Ch 2, Sec 2, [11] occurs.

**1.1.4** Where specific requirements are given in this Chapter for the class renewal survey, they are additional to the applicable requirements for the annual survey.

**1.1.5** For the assignment of the additional class notations, ships are to be submitted to an admission to class survey as described in Ch 2, Sec 1, [2] and Ch 2, Sec 1, [3] for new and existing installations, respectively, as applicable.

### 2 Additional class notations subject to additional surveys

#### 2.1

**2.1.1** The specific requirements detailed in this Chapter are linked to the additional class notation(s) assigned to the ship. Where a ship has more than one additional class notation, the specific requirements linked to each additional class notation are applicable as long as they are not contradictory.

**2.1.2** Tab 1 indicates which additional class notations are subject to specific requirements, and in which Section and/or Article they are specified.

**Table 1 : Additional class notations for which specific survey requirements are applicable (1/1/2017)**

Additional class notation	Section or Article applicable in this Chapter	Type of surveys affected by these specific requirements	Remarks
<b>MILITARY</b>	Sec 2	See Remarks	The scope of surveys according to the assigned confidential additional class notations are stipulated in Sec 2
Automated machinery systems: <b>AUT-IAS</b> <b>AUT-QAS</b>	Sec 3	annual survey class renewal survey	
Monitoring equipment: <b>MON-SHAFT-WATER</b>	Sec 4	annual survey class renewal survey tailshaft survey	
Other notations:			
<b>HELICOPTER</b>	Sec 5	As applicable in accordance with the related Articles in Sec 5	
<b>GREEN PLUS MIL</b>	Sec 5	annual survey class renewal survey	

## SECTION 2

## MILITARY NOTATION

### 1 General

#### 1.1

**1.1.1** The requirements of this Section apply to ships which have been assigned one of the following additional class notations described in Ch 1, Sec 2, [7.3]:

**NBC-PROT**

**EXT-BLAST**

**INT-BLAST**

**FRAGM**

**AIR-EX**

**SHOCK**

**TERR**

**1.1.2** At each survey the Owner or his representative is to declare to the attending Surveyor that no modifications have been made to the systems affecting the notations without prior approval by the Society.

### 2 NBC PROT

#### 2.1 Annual survey

**2.1.1** The annual survey is to include:

- examination and testing, as feasible, of airlocks, cleansing station(s) and filter station(s)
- examination of radioactivity, biological and chemical detection system(s) and check of number and position of detection units
- check of openings' closing appliances
- check of venting no-return valve(s)
- check of water seal against air entrance
- examination of washdown system, including piping, valves and nozzles
- examination of fresh air ventilation system, including ducts, convert appliances if any, and detector units.

#### 2.2 Class renewal survey

**2.2.1** At each class renewal survey a test is to be conducted in order to ascertain that the systems affecting the notations operate satisfactorily. This test is usually to be carried out during sea trials.

**2.2.2** The class renewal survey is to include:

- verification that the closing appliances of the openings of air compressed bottles have been hydrostatically tested
- check of gas tightness of closing appliances for ventilation openings and air lock doors

- check of overpressure of citadel, sanctuary and air locks under NBC condition
- check of gas tightness of overpressure part of engines air intake and exhaust ducts (i.e. turbocharger compressor casing, after cooler, intake manifold, exhaust manifold, turbocharger turbine casing, exhaust duct, blow-by duct)
- check of air conditioning capability under NBC condition.

### 3 EXT-BLAST

#### 3.1 Annual survey

**3.1.1** The annual survey is to include a particularly detailed inspection of the superstructure boundaries.

#### 3.2 Class renewal survey

**3.2.1** At each class renewal survey an extensive thickness measurements of the superstructure boundaries is to be carried out.

### 4 INT-BLAST

#### 4.1 Annual survey

**4.1.1** The annual survey is to include a detailed inspection of the structural boundaries of each safety area.

#### 4.2 Class renewal survey

**4.2.1** At each class renewal survey an extensive thickness measurements of the structural boundaries of each safety area is to be carried out.

### 5 FRAGM

#### 5.1 Annual survey

**5.1.1** The annual survey is to include a detailed inspection of the structural boundaries of each safety area. When a non-structural ballistic protection is fitted, its status and location is to be checked for compliance with the specific approved plan.

#### 5.2 Class renewal survey

**5.2.1** At each class renewal survey an extensive thickness measurements of the structural boundaries of each safety area is to be carried out.

## 6 AIR-EX

### 6.1 Annual survey

6.1.1 The annual survey is to include:

- verification that the component arrangement and location comply with the approved topological and detail functional schemes that define the performances that the ship is to be capable to operate after an air explosion
- inspection of the vital components, i.e. those included in the functional schemes, with the relevant mountings.

The inspection of mounting of components included in the topological and detail functional schemes is to be carried out as follows:

- for components in general: visual inspection for integrity check of rubber and steel resilient mountings
- tightness check of bolted mount connections
- for components which require precise alignment (e.g. main engines): check of mount lowering.

### 6.2 Class renewal survey

6.2.1 At each class renewal survey the inspection of mounting of components included in the topological and detail functional schemes has to include:

- check of manufacturer established expiry date of resilient mountings
- flexibility check of rubber resilient mountings.

## 7 SHOCK

### 7.1 Annual survey

7.1.1 The annual survey is to include:

- verification that the component arrangement and location comply with the approved topological and detail functional schemes that define the performances that

the ship is to be capable to operate after an air explosion

- inspection of the components included in the "Shock Catalog" with the relevant mountings.
- Inspection of external hull components that are not inspection for normal (without MILITARY notation) class purposes (e.g. fins, sonar).

The inspection of mounting of components included in the "Shock catalogue" is to be carried out as follows:

- for components in general: visual inspection for integrity check of rubber and steel resilient mountings
- tightness check of bolted mount connections
- for components which require precise alignment (e.g. main engines): check of mount lowering.

### 7.2 Class renewal survey

7.2.1 At each class renewal survey the pressure test of the sea water valves, pipes and heat exchangers, according to the assigned shock class and shock pressure load, is to be carried out.

7.2.2 The inspection of mounting of components included in the "Shock catalogue" has to include:

- check of manufacturer established expiry date of resilient mountings
- flexibility check of rubber resilient mountings.

## 8 TERR

### 8.1 Annual survey

8.1.1 The annual survey is to include a detailed inspection of the structural boundaries of each protected area. When a non-structural ballistic protection is fitted, its status and location is to be checked for compliance with the specific approved plan.

### 8.2 Class renewal survey

8.2.1 At each class renewal survey an extensive thickness measurements of the structural boundaries of each protected area is to be carried out.

## SECTION 3

## AUTOMATED MACHINERY SYSTEMS

### 1 General

#### 1.1

**1.1.1** The requirements of this Section apply to ships which have been assigned one of the following additional class notations related to automated machinery systems, as described in Ch 1, Sec 2, [7.4]:

AUT-IAS

AUT-QAS

### 2 Annual survey

#### 2.1

**2.1.1** The Owner or his representative is to declare to the attending Surveyor that no significant modifications have been made without prior approval by the Society.

**2.1.2** The annual survey is to include:

- an examination of the engineers' log-book to verify the proper operation of automation systems in the period subsequent to the last survey and measures taken to

avoid repetition of any malfunctions or failures which have occurred during the same period

- a general examination of the control systems covered by the notation, including a random check of the proper operation and calibration of main measuring, monitoring, alarm, and automatic shut-off devices
- a check of the fire detectors
- a check of the bilge flooding alarms
- a running test which may be also performed by a spot check method.

### 3 Class renewal survey

#### 3.1

**3.1.1** The requirements given in [2] for annual survey are to be complied with. An additional program of examinations, checks and tests is to be devised in agreement with the Owner and based on the operational data and experience of previous surveys. This program is to include verification of the calibration of instruments and testing of control and safety functions of the machinery. The Owner is to produce evidence that all these checks and tests have been carried out and this will be verified by the Surveyor at random. In addition, the proper operation of the control system of propulsion machinery is to be checked during sea trials.



## SECTION 4

## MONITORING EQUIPMENT

### 1 General

#### 1.1 Application

**1.1.1** The requirements of this Section apply to ships which have been assigned one of the following additional class notations related to hull and tailshaft monitoring equipment, as described in Ch 1, Sec 2, [7.5]:

**MON-SHAFT-WATER**

### 2 MON-SHAFT-WATER

#### 2.1 Tailshaft survey

**2.1.1** When the records of the tailshaft bearing temperature readings are checked and doubts arise, the Surveyor may require the verification of the accuracy of the gauging devices.

## SECTION 5

## OTHER NOTATIONS

### 1 General

#### 1.1

##### 1.1.1 (1/1/2017)

The requirements of this Section apply to ships which have been assigned the following additional class notation described in Ch 1, Sec 2, [7.6]:

#### HELICOPTER

#### GREEN PLUS MIL

### 2 HELICOPTER

#### 2.1 Annual survey - Hull items

**2.1.1** The survey is to include the helicopter deck supporting structure, safety net and arrangements for the prevention of sliding.

#### 2.2 Annual survey - Machinery items

**2.2.1** The following is to be checked, as far as appropriate:

- drainage arrangements around the landing area
- fire fighting appliances and arrangements (to be surveyed as per Ch 3, Sec 1, [3.4.2], according to the equipment installed
- overall examination of refuelling systems and hangar facilities for cleanliness and absence of leaks, condition of gutters and drainage arrangement.

### 2.3 Class renewal survey - Machinery items

**2.3.1** The following is to be checked, as far as appropriate:

- drainage arrangements around the landing area
- fire fighting appliances and arrangements (to be surveyed as per Ch 3, Sec 3, [3.8.3] and Ch 3, Sec 3, [3.8.4], according to the equipment installed)
- other arrangements for helicopter and/or aircraft refuelling and hangar facilities (fuel system, ventilation, fire protection and detection).

### 3 GREEN PLUS MIL

#### 3.1 Annual and class renewal survey

##### 3.1.1 (1/1/2017)

The survey is, as far as practicable, to include the following checks:

- a) verification that a responsible person is appointed as Ship Environmental Manager and is present on board,
- b) verification that all the additional systems and components involved in the ship's environmental index calculation (see Pt E, Ch 4 Sec 7, Tab 2 and Pt E, Ch 4, Sec 7, [4], if any) are well maintained and in good working condition;
- c) verification that all the additional procedural means involved in the ship's environmental index calculation (see Pt E, Ch 4 Sec 7, Tab 2 and Pt E, Ch 4, Sec 7, [4], if any) are followed and documented by appropriate recording;
- d) verification that adequate training on environmental issues is planned, carried out and documented for all the persons on board having influence on the environmental behavior of the ship.

