

**PART I CLASS - ADMINISTRATION**

**TITLE 01 CLASS-ASSIGNMENT**

**SECTION 2 CLASS - MANAGEMENT**

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- A CLASSIFICATION STAGES
- B DESIGN ANALYSIS
- C INSPECTION OF THE SHIP
- D INSPECTION OF COMPONENTS
- E SURVEYS OF THE CLASS PERIOD
- F SPECIFIC SURVEY
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**CHAPTER A**  
**CLASSIFICATION STAGES**

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- A2. STAGES OF CLASSIFICATION FOR SHIPS NOT YET UNDER CONSTRUCTION
- A3. STAGES FOR SHIPS ALREADY UNDER CONSTRUCTION
- A4. STAGES FOR EXISTING SHIPS
- A5. STAGES FOR MAJOR REPAIRS OR MODIFICATIONS

**A1. BEGINNING OF THE CYCLE OF CLASS**

**100. Admission to Class**

101. The assignment of a Class encompasses the services of checking the conditions under which the vessel is being built or the condition of existing ships. It is carried out during the construction or by survey of existing ships.

**200. Cycle of Class**

201. The cycle of class (period of classification) is counted from the specific surveys of the final construction stages, or from the specific Admission to Class surveys of existing ships, when the Class Certificate is issued for the first cycle.

**A2. STAGES OF CLASSIFICATION FOR NEW SHIPS NOT YET UNDER CONSTRUCTION**

**100. Sequence to be followed:**

101. The following stages are to be followed:

- a. Classification Contract;
- b. Design analysis of the plans and documents;
- c. Surveys during construction,
  - c.1. Examination of the parts of the ship covered by the Rules and by applicable statutory regulations for hull and 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.
  - c.2. 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.3. Witnessing inspections and tests as required in the Rules including materials, welding and assembling, specifying the items to be examined and/or tested and how (e.g. by hydrostatic, hose or leak testing, non-destructive examination, verification of geometry) and by whom.
- d. Inspection of materials and components at work comprised of:
  - d.1. Appraisal of material and equipment used for ship construction and their inspection at works are given in the RBNA Rules for the Construction and Classification of Steel Vessels, Part I Title 01, Section 2, Chapter D, and in Part III, Titles 61 to 63. Acceptance of these items is verified through the survey process carried out at the manufacturer's works and the issuing of the appropriate certificates;
- e. Supervision of the quay and sea trials;
- f. Confirmation that any outstanding class items, i.e., non-conformities in relation to the RULES requirements, have been attended to; and
- g. Issue of the CLASS CERTIFICATES

**A3. STAGES OF CLASSIFICATION FOR NEW SHIPS ALREADY UNDER CONSTRUCTION**

**100. Sequence to be followed:**

101. The following stages are to be followed:

- a. Classification Contract;
- b. Design analysis of the plans and documents;
- c. Surveys during construction, from the building stage as found;
- d. Inspection of materials and components already installed on board,
- e. Inspection of materials and components at work;
- f. Supervision of the quay and sea trials;
- g. Confirmation that any outstanding class items, i.e., non-conformities in relation to the RULES requirements, have been attended to; and
- h. Issue of the CLASS CERTIFICATES.

**A4. STAGES FOR EXISTING SHIPS**

**100. Sequence to be followed:**

101. The following stages are to be followed:
- a. Classification Contract;
  - b. Design analysis of the plans and documents;
  - c. Analysis of the existing certificates of ship's components;
  - d. Surveys on board the existing ship;
  - e. Inspection and tests of the materials and components installed on board;
  - f. Supervision of the quay and sea trials;
  - g. Confirmation that any outstanding class items, i.e., non-conformities in relation to the RULES requirements, have been attended to; and
  - h. Issue of the CLASS CERTIFICATES.

**A5. STAGES FOR MAJOR REPAIRS OR MODIFICATIONS**

**100. Sequence to be followed:**

101. The following stages are to be followed:
- a. Classification Contract for ship not classified yet;
  - b. Design analysis of the plans and documents;
  - c. Surveys on board the existing construction;
  - d. Inspection and tests of the materials and components installed on board;
  - e. Supervision of the quay and sea trials;
  - f. Confirmation that any outstanding class items, i.e., non-conformities in relation to the RULES requirements, have been attended to; and
  - g. Issue of the CLASS CERTIFICATES.

**CHAPTER B  
DESIGN ANALYSIS**

CHAPTER CONTENTS

- B1. ANALYSIS AND CALCULATIONS
  - B2. SPECIAL DESIGNS
  - B3. CONFORMITY WITH REGULATIONS OF NATIONAL AND INTERNATIONAL ADMINISTRATIONS
- 

**B1. ANALYSIS AND CALCULATIONS**

**100. Compliance with the RULES**

101. The RULES establish requirements - i.e., practical parameters for concepts, dimensioning, performance levels, formulas, prescriptions and procedures – through which it is verified the compliance of the design with the Rules to determine whether the ship is eligible to the CLASS to be assigned to it.

**200. Direct Calculation**

201. Whenever deemed appropriate by the designer, gathering the data regarding loads, stress distribution and reaction settings as well as environmental conditions, the calculations carried out by direct method are to be submitted for review and approval.

**300. Presentation of the documents for approval**

301. The documents required for class are presented for approval in either of two ways:

- a. **three hard copies of each:** two hard copies are retained by the Society and one hard copy is sent back to the Owners, duly stamped, as a register of the approval;
- b. **in virtual files:** the approval is also registered in the virtual files.

302. Where the Society is required to carry out Statutory Certification, the documents and plans required by the Maritime Authority are to be always sent in three hard copies and one digital copy:

- a. two hard copies are retained by the Society and one hard copy is sent back to the Owners, duly stamped, as a register of the approval;
- b. one digital copy is sent to the Maritime Authority.

303. The documents and plans required for the assignment of Class are listed in each Title, Section or Chapter, in Part II of the Rules, according to the mission of the vessel.

304. The documents required for Statutory Certification are listed in the NORMAM 01, where reference is made to ships having GT>500 subject to SOLAS, MARPOL, ILCC, TONNAGE Codes and IMO Resolutions.

## **B2. SPECIAL DESIGNS**

### **100. Special analysis**

101. The vessels' designs that include new concepts and new solutions will be submitted to special analysis of RBNA, in agreement with assumptions made by designers, Owners, builders, etc., including the use of direct calculation.

102. The designs not specifically indicated in these Rules are to be subject to procedures equivalent to those of item B2.101 above.

## **B3. CONFORMITY WITH NORMAMs AND INTERNACIONAL REGULATIONS**

### **100. Analysis and compliance for approval – vessels with GT < 500 under the Brazilian Flag**

101. Where Statutory Certificates are issued, the design and construction of vessels classified are checked for compliance with the requirements of NORMAMs (Standards of Brazilian Maritime Authority).

102. Whenever NORMAM 01 determines the application of codes, conventions and international regulations, the Statutory Certificates are issued according to the specified international regulations having in mind the concerned by-laws and models, included in NORMAM 06.

### **200. Analysis and compliance for approval – vessels with GT < 500 under the Foreign Flags**

201. Where Statutory Certificates are issued under Foreign Flags, the design and construction of vessels classified are checked for compliance with the requirements of the National Maritime Authority or, if those are not available, according to IMO regulations.

### **300. Analysis and compliance for approval – vessels with GT ≥ 500**

301. Where Statutory Certificates are issued for vessels with GT ≥ 500 of any Flag, the design and construction of vessels classified are checked for compliance with the requirements of IMO regulations.

## **CHAPTER C INSPECTION OF THE SHIP**

### **CONTEÚDO DO CAPÍTULO**

#### **C1. SHIP INSPECTIONS: NEWBUILDINGS**

C2. SHIP INSPECTIONS: EXISTING SHIPS OF AB < 500

C3. SHIP INSPECTIONS: EXISTING SHIPS OF AB ≥ 500 CLASSED WITH IACS SOCIETY IACS PR 1A SECTION B

C4. SHIP INSPECTIONS: EXISTING SHIPS OF AB ≥ 500 NOT CLASSED WITH IACS SOCIETY

C5. SUPERVISION OF CONSTRUCTION OF THE HULL FOR NEW BUILDINGS – ALL SHIPS

C6. SHIPS CARRYING LIQUEFIED GASES IN BULK - EXAMINATION BEFORE AND AFTER THE FIRST LOADED VOYAGE IACS UI GC 13

#### **C1. SHIP INSPECTIONS - NEWBUILDINGS**

### **100. Surveys for Newbuilding Supervision of Hull and Machinery in Dry and afloat**

101. During construction, the RBNA surveyors will be present to inspect the stages of the work and witness the correct attendance to the Rules and to the approved design. The builders, for this, will give locations and safe conditions, including the provision of early programmes for the work and for inspections and testing

102. The Program of Inspection and Testing of Newbuilding will be denominated Program of Surveys of Hull Construction. "PVCC" ("Programa de Vistorias de Construção do C and "PVCm" ("Programa de Vistorias de Construção da Maquinaria").

### **200. Surveys for Classification of Hull and Machinery in Dry**

201. The surveys for classification of hull and machinery in dry are performed in the shipyard at the end of the construction, before the vessel is launched afloat, to inspect the works on the hull below the waterline and verify the compliance with the requirements of the Rules and / or technical standards in force, according to the programs.

### **300. Surveys for Classification of Hull and Machinery Afloat**

301. The surveys for classification of hull and machinery afloat are performed in the shipyard on the end of the construction, to follow up the testing and trials of operation in all systems, along the quay and later on in sea trials, and verify the compliance with the Rules and / or technical standards in force, according to the programs.



**C2. SHIP INSPECTIONS: EXISTING SHIPS OF AB < 500**

**100. Surveys to assess the condition of the vessel**

101. In existing ships specific surveys are made for admittance to Class, to determine the vessel's conditions, degree of compliance with the RULES and accordance with the approved design

102. The contractors, for that end, will provide locations and safe conditions for the survey, including the provision of early programming of work and preparations for inspections and tests. The program of inspections and tests for admittance to class will be called by "PITA".

**200. Admittance to class: Hull and Machinery Surveys in Dry**

201. In existing ships, the surveys for admittance to class of hull and machinery in dry are performed in existing ships to inspect the parts under the waterline, check the compliance with approved plans and verify compliance with the Rules and / or other technical standards in force, according to a Program of Inspections and Tests (PITA). This program is to include verification of compliance with the requirements of the CLASS Renewal Survey.

**300. Admittance to class Hull and Machinery Surveys Afloat**

301. The surveys for classification of hull and machinery afloat are performed in existing ships to witness tests and trials of operation in all systems, along the quay and later on sea trials, to confirm the performance, verify compliance with the approved designs and with the requirements of the Rules and / or any other technical standards in force according, to a Program of Inspections and Tests (PITA). This program is to include the verification of compliance with the requirements of the CLASS Annual Survey.

**C3. SHIP INSPECTIONS: EXISTING SHIPS OF AB ≥ 500 CLASSED WITH IACS SOCIETY [IACS PR1A SECTION B, C]**

**100. Application**

101. For transfer of class from one Society to another, the following minimum technical requirements are to be applied.

**200. Plans and information**

201. The gaining Society is to request copies of plans showing the main scantlings and arrangements of the actual vessels and machinery, together with any proposals for alterations being dealt with, from the Owner. Receipt of plans listed in item C3.203 below, or equivalent, alternative technical data in lieu of specific plans or items, is to be identified to the Owner as a prerequisite to issuance of a full term Class Certificate by the gaining Society.

202. However, having made a good faith effort to obtain the information, if it proves not practicable to acquire certain plans as listed in item C3.203 below, or equivalent, alternative technical data, the gaining Society may issue the full term Class Certificate provided that its classification records document that the vessel is being accepted into class on the basis of a recorded internal review of the circumstances prevailing with respect to availability of plans.

203. Plans to be submitted: the plans to be submitted are listed, but not limited to, below:

- a. Naval Architecture
    - a.1. General Arrangement
    - a.2. Lines Plan\*
    - a.3. Capacity Plan
    - a.4. Hydrostatic and Isocline\* Curves
    - a.5. Loading Manual, where required.
  - b. Structural plans
    - b.1. Midship Section
    - b.2. Scantling Plan
    - b.3. Decks
    - b.4. Shell Expansion
    - b.5. Transverse and Longitudinal\* Bulkheads
    - b.6. Bow construction\*
    - b.7. Stern construction\*
    - b.8. Rudder and Rudder Stock
    - b.9. Hatch Covers
    - b.10. Main Engine Foundations\*
- (\*) RBNA additional requirements
- c. Machinery plans
    - c.1. Machinery Arrangement
    - c.2. Intermediate, Thrust- and Screw Shafts
    - c.3. Propeller
    - c.4. Main Engines, Propulsion Gears and Clutch Systems (or Manufacturer make, model and rating information)
    - c.5. Chocks and bolts of the main engine seating\*



- c.6. For Steam Turbine Vessels, Main Boilers, Superheaters and Economisers (or Manufacturer make, model and rating information) and Steam Piping
  - c.7. Bilge and Ballast Piping Diagram
  - c.8. Wiring Diagram
  - c.9. Steering Gear Systems Piping and Arrangements and Steering Gear Manufacturer make and model information
- (\*) RBNA additional requirements
- d. Torsional vibration calculations:
    - d.1. For vessels less than two (2) years old, torsional vibration calculations are to be submitted.
  - e. Additional requirements for vessels with ice class notation
    - e.1. Plans for flexible couplings and/or torque limiting shafting devices in the propulsion line shafting (or manufacturer make, model and rating information) are to be submitted.
  - f. Additional plans required for oil tankers
    - f.1. Pumping arrangement at the forward and after ends and drainage of cofferdams and pump rooms are to be submitted.
  - g. Additional plans required for unattended machinery space notation: the following additional plans are to be submitted:
    - g.1. Instrument and Alarm List
    - g.2. Fire Alarm System
    - g.3. List of Automatic Safety Functions (e.g. slowdowns, shutdowns, etc.)
    - g.4. Function Testing Plan.
204. Additional information may be necessary according to Flag State requirements.
205. Alternative technical data may be accepted by the gaining Society in lieu of specific items of the listed documentation not being available at the time of the transfer.

### 300. Class Entry Surveys

301. Notwithstanding the records indicating that all surveys are up-to-date, a class entry survey is to be held by the gaining Society, the minimum extent of which is to be based on the age of the vessel and the losing Society's class status as follows below.

302. Class entry surveys may be, but are not required to be, credited as periodical surveys for maintenance of classification.

303. Recommendations and/or conditions of class due for compliance at a specified periodical survey for maintenance of classification need not be carried out/complied with at a class entry survey unless the class entry survey is credited as the specified periodical survey for maintenance of classification or the recommendation / condition of classification is overdue.

### 400. Hull Class Entry Survey:

401. For vessels of age less than 5 years the survey is to take the form of an Annual Survey;

402. Additionally, for vessels between 5 and 10 years of age the survey is to include inspection of a representative number of ballast spaces;

403. Additionally, for vessels of 10 years of age and above but less than 20 years of age, the survey is to include inspection of a representative number of cargo spaces;

404. For vessels subject to ESP programs (single and double hull oil tankers, single and double hull bulk carriers, chemical tankers) which are 15 years of age and above but less than 20 years of age, the survey is to have the scope of a Special Survey or an Intermediate Survey, whichever is due next;

405. For all vessels, which are 20 years of age and above, the survey is to have the scope of a Special Survey. This requirement is also applicable to the vessels having their hull under continuous survey.

406. In the context of applying items C3.404 and C3.405 above, if a dry-docking of the vessel is not due at the time of transfer, consideration can be given to carrying out an underwater examination in lieu of dry-docking.

407. In the context of applying items C3.401 to C3.406 above, as applicable,

- a. If the class entry survey is to be credited as a periodical survey for maintenance of class consideration may be given by the gaining society to the acceptance of thickness measurements taken by the losing society provided they were carried out within the applicable survey window of the periodical survey in question.

408. In the context of applying C3.403 to C3.406 above, as applicable, tank testing for vessels over 15 years of age is not required to be carried out as part of the class entry survey unless the class entry survey is being credited as a periodical survey for maintenance of class.

409. In the context of applying C3.401 to C3.406 above, as applicable, compliance with IACS Unified Requirements that require compliance at the forthcoming due periodical surveys (such as S26 and S27) are not required to be carried out/completed as part of the class entry survey unless the class entry survey is credited as a periodical survey for maintenance of class.

#### **500. Machinery Class Entry Survey.**

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

502. All pressure vessels;

503. Insulation resistance, generator circuit breakers, preference tripping relays and generator prime mover governors are to be tested and paralleling and load sharing to be proved;

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

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

506. Recirculating and ice clearing arrangements, if any;

507. The main and all auxiliary machinery necessary for operation of the vessel at sea together with essential controls and steering gear is to be tested under working conditions. Alternative means of steering are to be tested. A short sea trial is to be held at the Surveyors discretion if the vessel has been laid up for a long period;

508. Initial start arrangements are to be verified;

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

510. For the transfer of class or adding class at ship's delivery, items C3.503 and C3.509 may be verified by reviewing the ship's record.

#### **C4. SHIP INSPECTIONS: EXISTING SHIPS OF AB ≥ 500 NOT CLASSED WITH IACS SOCIETY**

101. Plans to be submitted: the plans to be submitted are listed, but not limited to, the list in Subchapter C3 item 200 above.

102. The main and all auxiliary machinery necessary for operation of the vessel at sea together with essential controls and steering gear is to be tested under working conditions. Alternative means of steering are to be tested. A short sea trial is to be held.

103. 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.

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

105. In addition, the Society may base its judgment upon documentation such as certificates issued or accepted by the former Classification Society, if any, and statutory certificates issued by the flag Administration or by a recognised organisation on its behalf; moreover, other documents and/or plans may be specifically required to be supplied to the Society in individual cases.

106. Additional information may be necessary according to Flag State requirements.

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

#### **200. Admittance to class Hull and Machinery Surveys**

201. The extent and scope of the admission to class survey are 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 class notations and/or additional class notations and/or special installations the ship is provided with.

#### **C5. SUPERVISION OF CONSTRUCTION OF THE HULL FOR NEW BUILDINGS – ALL SHIPS [IACS URZ 23]**

##### **100. Application**

101. This subchapter C5 covers the survey of all new construction of steel ships irrespective of the gross tonnage being intended for classification and for national and international voyages, in open sea except for:

- a. restrictions, exemptions and additional requirements when clearly stated in the Ruler;

- b. high speed craft as defined in I/1.3.1 of the 2000 High Speed Craft Code;
- c. Mobile Offshore Drilling Units as defined in I/1.2.1 of the MODU Code;
102. This subchapter covers all statutory items, relevant to the hull structure, i.e. Load Line and SOLAS Safety Construction.
103. The manufacture of equipment, fittings and appendages listed below, regardless whether they are made inside or outside of the shipyard, is covered by Part I, Title 2, Section 2, Chapter D. Evidence of acceptance shall be provided by accompanying documentation from class surveyor at manufacturer and verified at the shipyard:
- 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.
104. This subchapter applies to the installation into the ship, welding and testing of:
- a. the items listed in C5.103 above;
- b. equipment forming part of the watertight and weather tight integrity of the ship.
105. this subchapter C5 applies to the hull structures constructed at any of the following:
- a. shipbuilder's facilities;
- b. sub-contractors at the shipbuilder's facilities;
- c. sub-contractors at their own facilities or at other remote locations.
106. Exclusive surveyors of the RBNA, are to verify that the 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 the tasks and procedures are to be in place to ensure that their activities are monitored.
- 200. Terms and definitions**
201. The hull structure 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 – all ILLC 1966, as amended, items;
- 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.
202. Reference to documents also includes electronic transmission or storage.
203. Definition of survey methods which the surveyor is directly involved in Patrol, Review and Witness.
- a. Patrol is the act of checking on an independent and unscheduled basis that the applicable processes, activities and associated documentation of the shipbuilding functions identified in Table T.C5.401 continue to conform with classification and statutory requirements.
- b. Review is the act of examining documents in order to determine traceability, identification and to confirm that processes continue to conform with classification and statutory requirements.
204. Rules in the present Procedure will be defined as the RBNA Rules for the Construction and Classification of Steel Vessels destined to Open Sea Navigation.
- 300. Plans, documents and regulations**
301. Plans for Part II, Title 11, Section 1, Chapter B. of the RBNA Rules:
- a. Light ship weight and centres estimate;
- b. Statutory plans as for NORMA M 01 Chapter 03 for Plans for Part II, Title 11, Section 1, Chapter B:
- c. General arrangement;
- d. Lines plan;
- e. Capacity plan;
- f. Notes for tonnage assignment;
- g. Hull openings and means of closure;
- h. Inclining trial report;
- i. Draft measurement trial reports (whenever the inclining trial is not required);
- j. Stability and trim booklet;
- k. Notes for freeboard assignment

302. Documents for Part II, Title 11, Section 3, Subchapter B1, cargo handling system: the documents for the installation of the cargo handling system will inform:

- a. Diagram of transmitted loads from the system to the hull structure;
- b. Materials and configuration of the system elements;
- c. Seatings and means of connecting to the hull

303. Documents for Part II, Title 11, Section 3, Subchapter B1, for the anchoring, mooring and towing system: the documents will inform:

- a. Zone of navigation;
- b. Vessel's service / activity;
- c. Displacement;
- d. Freeboard;
- e. Lateral and frontal area ;
- f. Selected equipment giving dimensional characteristics and materials employed.

304. Documents for Part II, Title 11, Section 3, Subchapter B1, manoeuvring system will inform:

- a. Vessel's service / activity and zones of navigation;
- b. Draft and speed;
- c. Configuration, dimension, material, connections and bearing of the tiller and rudder stock;
- d. Driver and transmission systems;
- e. Command system;
- f. Emergency steering system.

305. Documents for Part II, Title 11, Section 3, Subchapter B1, hull openings – protection and means of closure, will inform:

- a. Location and dimension of the openings leading into the hull or into superstructures and deckhouses;
- b. Dimension and materials for the means of closure

306. It is recommended that a plan "Hull openings and means of closure" be submitted for approval containing all the openings, including ventilation ducts and piping connections with their valves and means of closure

307. Documents for Part II, Title 11, Section 3, Subchapter B1, hull accessories, will inform:

- a. Materials and configuration of the accessories;

b. Loads on the accessories

308. The following regulations apply:

- a. RBNA - Rules for the Construction and -Classification of Steel Ships for Open Sea Navigation
- b. NORMAM 01
- c. IMO Resolution A.739 (18)
- d. IMO Resolution A.789 (19)
- e. IMO Conventions, Codes and Resolutions as applicable
- f. IACS UR Z 23 – Hull Survey for New Construction

**400. Survey of the hull structure**

401. Table T.C5.401.1 provides a list of surveyable items for the hull structure covered by this subchapter, including:

- a. description of the shipbuilding functions;
- b. classification and statutory survey requirements;
- c. survey method required for classification;
- d. relevant IACS and statutory requirement references;
- e. documentation to be available for the classification surveyor during construction.

402. The form FORMDVIN\_65\_02 – PVCC provides a comprehensive checklist to be discussed with the yard previous to the construction and to keep registers throughout the construction.

403. The shipbuilder is to provide the classification surveyors access to documentation required by classification, this includes documentation retained by the shipbuilder or other third parties.

404. The list of documents approved or reviewed by the RBNA for the specific new construction are as follows:

- a. plans and supporting documents
- b. examination and testing plans
- c. NDE plans
- d. welding consumable details
- e. welding procedure specifications
- f. welding plan or details
- g. welder's qualification records
- h. NDE operators qualification records

405. Documents to be inserted into the ship construction file. Table T.C5.401.1.

406. 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.

407. Evidence is also to be made available, as required, by the shipbuilder, to the surveyor whilst the construction process proceeds to prove that the material and equipment supplied to the ship has been built or manufactured under survey relevant to the classification rules and statutory requirements.

408. Review of the construction facility: The RBNA is to review the construction facilities prior to any steelwork or construction taking place in the following circumstances:

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

#### **500. Newbuilding survey planning**

501. Prior to commencing any new building project, the RBNA is to discuss with the shipbuilder at a kick off meeting the items listed in Table T.C5.401.1. The purpose of the meeting is to agree how the list of specific activities shown in Table T.C5.401.1 is to be addressed. The meeting is to take into account the shipbuilder’s construction facilities and ship type and deal with sub-contractors if it is known that the builder proposes to use them. The shipyard is to be informed of likely intervals for sampling and patrol activities. A record of the meeting is to be made. The contents of the Table T.C5.401.1 can be used as the record with comments made into the appropriate column.

502. If the RBNA has nominated a surveyor for a specific new building project then the surveyor is to attend the kick off meeting.

503. The builder is to be asked to agree to undertake ad hoc investigations during construction where areas of concern arise and for the builder to agree to keep the RBNA advised of the progress of any 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.

504. The records are to take note of specific published Administration requirements and interpretations of statutory requirements.

505. The record of the meeting is to be updated as the construction process progresses in the light of changing

circumstances, e.g. if the shipbuilder chooses to use or change sub-contractors, 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.

506. 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 for New Construction”, or a recognized fabrication standard which has been accepted by the RBNA prior to the commencement of fabrication/construction. The work is to be carried out in accordance with the Rules and under survey of the RBNA.

507. The kick-off meeting may be attended by other parties as Owner, Administrations, etc. subject to agreement by the shipbuilder.

508. In the event of series ship production and where the RBNA has a continual presence in the shipyard, consideration may be given to modification of the kick off meeting. The agenda would include essential variables from previous ships, e.g. flag requirements, modifications from previous ships, effects of key dates etc. subject to mutual agreement with the builder. In any instance the RBNA must maintain records to demonstrate compliance with Table T.C5.401.1. The RBNA will still need to demonstrate that changes described in this section have been addressed.

#### **600. Examination and test plan for new building activities**

601. 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 are to include 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.

602. The plans and any modifications to them are to be submitted to the surveyors in sufficient time to allow approval before the relevant construction phase commences. The RBNA is to require sample rates of NDE, proposals for steelwork survey, tank testing requirements, etc. if the actual



construction process warrants it. The RBNA is to demonstrate proof to justify the request.

603. Proof of the consistency of surveys : The RBNA is to be able to provide evidence, e.g. through records, check lists, inspection and test records, etc. that its surveyors have complied with the requirements of the new building survey planning and duly participated in the relevant activities shown in the shipbuilder's examination and test plans.

604. For audit purposes, the information specified in C2.601 is to be made available.

#### 700. Ship construction file

701. 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 ship-owner and where separate arrangements have been made for document delivery which excludes the shipbuilder, that party has the responsibility.

702. It is recognised that the purpose of documents held in the Ship Construction File on board the ship, is to facilitate inspection (survey) and repair and maintenance, and, therefore, is to include in addition to documents listed in Table T.C5.401.1 but not be limited to:

- 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 (Part 01, Title 02, Section 2, Chapters C, D, F, G and I) for holds and ballast tanks of oil tankers, bulk carriers and chemical carriers);
- b. manuals required for classification and statutory requirements, e.g. loading and stability, bow doors and inner doors and side shell doors and stern doors – operations and maintenance manuals (IACS Unified Requirements UR S8 and S9);
- c. ship structure access manual, as applicable;
- d. copies of certificates of forgings and castings welded into the hull (Part III, Title 61, Section 2, Chapters C and D);
- e. details of equipment forming part of the watertight and weather tight integrity of the ship;
- f. tank testing plan including details of the test requirements (Part II Title 11 Section 2. Subchapter T6);
- g. corrosion protection specifications (Part I Title 2 Section 2, Chapter B and Parte I, Title 2, Section 2 Chapter E);
- h. details for the in-water survey, if applicable, information for divers, clearances measurements instructions etc., tank and compartment boundaries;

i. docking plan and details of all penetrations normally examined at drydocking;

j. Coating Technical File, for ships subject to compliance with the IMO Coating Performance Standard (PSPC) as a class requirement under the Common Structural Rules.



**TABLE T.C5.401.1SUMMARY OF REQUIREMENTS FOR HULL SURVEYS**

Ref.	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS Ref.	Statutory Requirements and Relevant Reference	Documentation available To Class Surveyor During Construction	Documentation for Ship Construction File	Specific Activities	Classification Society Proposals for The Project
	Shipbuilding quality control functions								
1	Welding								
1.1	Welding consumable	Classification approved separately at the manufacturer	Review approval status and patrol, verify storage, handling and treatment in accordance with manufacturer's requirements	UR W17		Consumable specification and approval status	not required	identify consumables against approved list	
								verify temporary and permanent storage facilities	To be kept dry, covered, heated
								verify traceability	Random batch number checking
1.2	Welder qualification	Qualified welders	Review of welder qualification and patrol	Rec 47		Shipyards records with individual identification	Not required	verify welder qualification standard, e.g. class or recognised standard approval	Random check against list of approved welders
								verify welder approved for weld position	
								verify validity of qualification certificate	
1.3	Welding mechanical	All weld joint configurations,					Not required		

	properties (welding procedures)	positions and materials to be covered by weld procedures approved by the classification society or by another IACS member available							
1.3 cont.		The classification society witnesses all new weld procedure qualification tests carried out in the shipyard whenever the classification society is surveying in the shipyard	Review and patrol	UR W28		Approved weld procedure specification and welding plan relevant to the ship project or process	Not required	verify weld procedures records have been approved and cover all weld processes and positions in accordance with classification or recognised standards.	
								verify procedures are available at relevant workstations	
								verify weld procedures are available for the surveyors reference	
1.3.a	Welding equipment	Correctly calibrated and maintained	Patrol and review			Shipbuilders maintenance and calibration records	Not required	verify condition of machinery and equipment.	Special attention to earth connections
								verify machines are calibrated by appropriate staff	
								verify calibration carried out in accordance with manufacturer's recommendations	
								verify calibration in accordance with maintenance	

								schedule	
1.3.b	Welding environment	Satisfactory environment	Patrol	Recn 47			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	Sub-contractors must be certified by RBNA
								Verify NDE is carried out according to the acceptable process	
								Review NDE records	
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	Rec 20 and 47		Shipbuilders and recognized standards and Rules as applicable, welding and NDE plans, NDE	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	Sub-contractors must be certified

								have been employed	by RBNA
								Verify NDE is carried out according to the acceptable process	
								Review NDE records	
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	Rec 20 and 47		Shipbuilders and recognized standards and Rules as applicable, welding and NDE plans, NDE reports,		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,	
1.5 cont.								Verify that reports and radiographs have been evaluated correctly by the shipbuilder. Systematic review of radiographs carried out by the surveyor	
								Verify equipment	

								calibration satisfactory and in accordance with manufacturers and recognized standards requirements	
								Verify NDE is carried out according to the acceptable process	
2	Steel preparation and fit up								
2.1	Surface preparation, marking and cutting	Traceability and acceptability of material, check of steel plates & profiles materials type, scantling identification, testing marks		Rec 47		Material certificates, shipbuilder's marking/cutting production documents at the workstage – documents retained at the facility		Verify stockyard storage satisfactory	
								Verify material traceability, e.g. stamping identification against material certification, archiving of records	
2.1 cont.								Verify transfer marking after treatment line	
								Verify transfer marking after treatment line	
								Verify standard of shotblasting and priming	
								Verify suitability of	

								primer	
								Verify that steel grades can be identified	
								Verify machinery adjusted to maintain within IACS or manufacturers recommendations.	
								Verify accuracy of marking and cutting Verify storage of piece parts	
2.2	Straightening	Approval of straightening methods/procedures Against deformation	Patrol and review	Rec 47		Recognised standards, approved procedures		Verify that straightening processes are approved for the grade and type of steel, e.g. tmcp, z plate.	
								Verify that plates and sections are within recognised tolerances	
2.3	Forming	Check alignment/fit up/gap against reference standards	Patrol	Rec 47		Shipbuilders and recognized standards and Rules as applicable,		Verify the processes to ensure satisfactory fit up and alignment at all workstations	
								Verify that edge preparations are reinstated where lost during fitting operations	
2.3 cont)								Verify that forming processes are acceptable	
2.4	Conformity with alignment/fit up/gap criteria	Check alignment/fit up/gap against reference standards	Patrol	Rec 47		Shipbuilders and recognized standards and Rules as		Verify the processes to ensure satisfactory fit up and alignment at all workstations	



						applicable,			
								Verify that edge preparations are reinstated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	
2.5	Conformity for critical areas with alignment/fit up or weld configuration	Check alignment/fit up/gap against approved drawings	Patrol and review	Rec 47		Shipbuilders and recognized 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 reinstated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	
3	Steelwork process, e.g. sub assembly, block, grand and mega	Compliance with approved drawings, visual examination of welding and material, check	Patrol of the process and witness of the completed item	Rec 47		Approved plans, shipbuilders inspection records,		Verify that the information relevant to the latest approved drawings is available at the	

	block assembly, perfection and erection, closing plates	alignment and deformations				Shipbuilders and recognized standards and Rules as applicable, construction plan (steelwork subdivision)		workstations	
								Verify that correct weld sizes have been adopted	
								Verify operation of the welding processes at the different work stages is satisfactory	
								Verify that the information relevant to the latest approved drawings is available at the workstations	
								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 etc. are acceptable	
3 cont.							Confirm that steelwork is in accordance with the		

								approved plan	
4	Remedial work and alteration	Welding, check against deformation, alignment	Review records and witness	Rec 47		Permanent record of shipyard surveyable item		Verify that records have been maintained of significant deviations from the approved plans, for situations such as miss cut openings, re-routing outfit items	
								Verify that all deviations brought to the attention of the classification society by the shipbuilder are acceptable	
5	Tightness testing, including leak and hose testing, hydropneumatic testing	Absence of leaks	Patrol of the process and witness of the test	UR S14	Reg. II-1/14 of SOLAS as amended;	Approved tank testing plan, shipbuilders inspection records	Approved tank testing plan	Confirm that tank testing is carried out in accordance with the approved plan	Do not employ manometers when performing pneumatic testing
								Confirm the methods used to carry out leak testing	
								Confirm that correct test pressures maintained for leak, hose and hydro and hydropneumatic testing is satisfactory	
								Verify that adequate records of the tank testing have been maintained	
6	Structural testing	Structural adequacy of	Witness testing	UR S14	Reg. II-1/14 of	Approved tank testing plan,	Approved tank testing	Confirm that tank testing is carried out	

		the design			SOLAS as amended	shipbuilders inspection records,	plan	in accordance with the approved plan	
6 cont.								Confirm that correct test pressures maintained for testing is satisfactory	
								Verify that adequate records of the tank testing have been maintained	
7	Corrosion protection systems, e.g. coatings, cathodic protection, impressed current	Salt water ballast tanks with boundaries formed by the hull envelope, and also bulk	Review and report on builder's & manufacturer's documentation	UR Z 8 and Z 9, UI SC122, UR F1	Reg. II-1/3-2 of SOLAS as amended;	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 file	
8	Installation, welding and testing of the following:								
8.1	Hatchcovers	Tightness and securing	Witness	UR S14 & Rec 14	Reg. 13-14-15 and 16 of ILLC '66	Approved tank testing plan, shipbuilders 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	UR S14	Reg. II-1/18 of SOLAS as amended; Reg. 12 and 21 of ILLC '66	Approved tank testing plan, shipbuilders inspection records	Details required	Confirm leak test	

								Confirm operation and securing test		
								Confirm safety device operation		
8.2 cont.								Ensure correct maintenance logs/manuals supplied with the ship construction file		
8.3	Rudders	Fitting	Witness	UR S14		Approved plan, shipbuilders 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	
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	UR W7 & W8		Approved plans, shipbuilders inspection records, Shipbuilders and recognized standards and Rules as applicable, construction plan (steelwork subdivision)	Copies of certificates of forgings and castings	Verify casting 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	
	Appendages							Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	
8.5	Equipment forming the watertight and weathertight integrity of the ship, e.g. overboard discharges, air pipes, ventilators	Tightness and securing	Witness		Reg. II-1/19 of SOLAS as amended; Reg. 17-18-19- 20-22-23 of ILLC '66	Approved tank testing plan, shipbuilders 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	
								Verify Compliance with Load line Convention 1966 as amended - i.e.all fittings in accordance with the record of freeboard assignment	
								Verify air pipes, vents etc closing device are approved type	
								Verify material certificates for overboard discharges where applicable	
								Verify record of	



								freeboard assignment and all material certificates included in the ship construction file	
8.6 cont.	Freeboard marks	Within allowable tolerances and in accordance with the freeboard assignment	Witness	UI-LL4	Reg. 4- 5- 6- 7 and 8 of ILLC '66		Details required	Verify freeboard marks in accordance with load line assignment	
								Verify draft marks in accordance with the agreed tolerances specified by the builder unless more onerous flag state requirements	
								Verify principal dimensions in accordance with recognized standard	
8.7	Principal dimensions	Within allowable tolerances	Review and witness	Rec 47			Details required	Verify principal dimensions in accordance with recognized standard	
								Verify dimensions included in ship construction file	
8.8	Safety construction certification	No outstanding imperfections or defects	Witness		Reg. 10 of SOLAS as amended			Verify that Administration requirements have been incorporated into the hull structure	

## 800. References

801. IACS Unified Requirements UR Z7.1 Hull Surveys for General Dry Cargo Ships
802. IACS Unified Requirements Z8 Corrosion Protection Coating for Salt Water Ballast Tanks
803. IACS Unified Requirements Z9 Corrosion Protection Coating for Cargo Hold Spaces on Bulk Carriers
804. IACS Unified Requirements Z10.1 Hull surveys of Oil Tankers
805. IACS Unified Requirements Z10.2 Hull surveys of Bulk Carriers
806. IACS Unified Requirements Z10.3 Hull surveys of Chemical Tankers
807. ACS Unified Requirements Z10.4 Hull surveys of Double Skin Bulk Carriers
808. IACS Unified Requirements Z.23 Hull Surveys During Construction
809. IACS Unified Requirements UR S8 Bow Doors and Inner Doors
810. IACS Unified Requirements UR S9 Side Shell Doors and Stern Doors
811. ACS Unified Requirements UR S14 Test Procedures of Watertight Compartments
812. IACS Unified Requirements UR W Materials and Welding, in special:
813. IACS Recommendation Rec 47 – Repair and Quality Standards
814. IACS Recommendation Rec 82 – Surveyor’s Glossary: Hull Terms & Hull Survey Terms

## C6. SHIPS CARRYING LIQUEFIED GASES IN BULK - EXAMINATION BEFORE AND AFTER THE FIRST LOADED VOYAGE [IACS UI GC 13]

### 100. Purpose

101. The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code), 4.10.14 reads:

*“The overall performance of the cargo containment system should be verified for compliance with the design parameters during the initial cool-down, loading and discharging of the cargo. Records of the performance of the components and*

*equipment essential to verify the design parameters should be maintained and be available to the Administration.”*

102. IGC Code, 4.10.16 reads:  
*“The hull should be inspected for cold spots following the first loaded voyage.”*

103. Paragraphs 4.10.14 and 4.10.16 shall be interpreted as follows:

104. This UI applies to all vessels carrying liquefied natural gases (LNG) in bulk which have satisfactorily completed gas trials.

### 200. Certification

201. The following initial certificates shall be “conditionally” issued at delivery subject to satisfactory completion of the first cargo loading and unloading survey requirements below in the presence of a Surveyor:

- a. Classification Certificate
- b. Short Term Certificate of Fitness for the Carriage of Liquefied Gases in Bulk

202. The conditions may either be stated on the Classification Certificate or issued as a Condition of Class/Outstanding Recommendation in the vessel’s Record.

### 300. Survey Requirements : First Loading (considered to be full loading):

301. Priority to be given to latter stages of loading (approximately last 6 hours).
302. Review cargo logs and alarm reports.
303. Witness satisfactory operation of the following:
  - a. Gas detection system.
  - b. Cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.
  - c. Nitrogen generating plant or inert gas generator, if operating.
  - d. Nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable.
  - e. Cofferdam heating system, if in operation.
  - f. Reliquefaction plant, if fitted.
  - g. Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.

304. Examination of on-deck cargo piping systems including expansion and supporting arrangements.

305. Witness topping off process for cargo tanks including high level alarms activated during normal loading.

306. Advise master to carry out cold spot examination of the hull and external insulation during transit voyage to unloading port.

**400. First Unloading:**

401. Priority to be given to the commencement of unloading (approximately first 4 – 6 hours).

402. Witness emergency shutdown system testing prior to commencement of unloading.

403. Review cargo logs and alarm reports.

404. Witness satisfactory operation of the following:

- a. Gas detection system.
- b. Cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.
- c. Nitrogen generating plant or inert gas generator, if operating.
- d. Nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable.
- e. On membrane vessels, verify that the readings of the cofferdam and inner hull temperature sensors are not below the allowable temperature for the selected grade of steel. Review previous readings.
- f. Cofferdam heating system, if in operation.
- g. Reliquefaction plant and review of records from previous voyage.
- h. Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.

405. Examination of on-deck cargo piping systems including expansion and supporting arrangements.

406. Obtain written statement from the Master that the cold spot examination was carried out during the transit voyage and found satisfactory. Where possible, the surveyor should examine selected spaces.

**CHAPTER D  
INSPECTION OF COMPONENTS**

**CHAPTER CONTENTS**

**D1. DESIGN AND TYPE APPROVAL**

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**D1. DESIGN AND TYPE APPROVAL**

**100. Approach  
[IACS UR Z17]**

101. The manufacture of components in third parties is to have the presence of a RBNA surveyor to inspect the stages of the work and to witness the correct performance of the tests.

102. The manufacturers, for that end, will provide locations and safe conditions, including the provision of a programme previous to the beginning of the surveys containing the schedule of work, the preparations for and the inspections and tests to be carried out.

**200. Conditions of supply**

201. The conditions of supply will indicate the conditions for the classification and the Classification Society fees.

**300. Surveys and Certificates**

301. The components (materials and equipment) will be subject to a survey denominated Specific Component Survey, as per Part I, Title 01, Section 2, Chapter F. Upon satisfactory conclusion of the surveys and tests, the relevant Certificate is to be issued.

## CHAPTER E SURVEYS OF THE CLASS PERIOD

### CHAPTER CONTENTS

- E1. APPROACH
- E2. ANNUAL SURVEYS
- E3. INTERMEDIATE SURVEY
- E4. SURVEY IN DRY DOCK
- E5. PROPELLER SHAFT SURVEY
- E6. ISOLATED CASES SURVEYS.
- E7. CLASS RENEWAL SURVEY
- E8. OCCASIONAL SURVEYS
- E9. PERIODICAL SURVEYS OF THE SPECIAL SERVICE SHIPS

#### E1. APPROACH

##### 100. Application and programme

101. The ships classified by RBNA are submitted to periodical surveys for the maintenance of the hull and machinery CLASS, as indicated below.

See Part I, Title 2, Section 2 for the scope of surveys, application and conditions for survey.

102. When time is due, as stated in these Rules, the ships will be placed under conditions of having their hulls and equipment inspected, with all their spaces to be inspected and / or tested with unimpeded access and safe condition, so that the tests to be followed can be performed. For the due periods and time of cycles, see Part I, Title 02, Section. 1, SURVEYS – PERIODICITY.

103. For carrying out surveys of hull and machinery in dry, the vessel will be placed in dry or floating dock and / or slipway on docking blocks that provide appropriate conditions for due inspections and tests.

#### E2. ANNUAL SURVEYS

##### 100. Annual Hull and Machinery Survey – (VAC /VAM - Vistoria Annual de Casco/Maquinas);

101. The annual hull and machinery surveys of the ship afloat (VAC, VAM) are to be carried out every year of ship's service.

#### E3. INTERMEDIATE SURVEY

##### 100. An Intermediate Hull Survey (VIC)

101. The intermediate surveys of the hull afloat are to be carried out at every half of classification cycle.

102. For riveted ships of age > 15 years, ships presenting an accentuated degree of corrosion and ships for services, dry dock and propeller shaft surveys will be carried out.

103. The intermediate surveys, excepting those cases described in the previous section, may be waived at the discretion of RBNA for the following vessels:

- a. of the material not subject to corrosion (aluminium, plastic reinforced with fiberglass etc.)
- b. non-propelled

#### E4. SURVEY IN DRY DOCK

##### 100. Survey in dry dock (VDC)

101. Surveys in dry dock are carried out during the following periods:

- a. at each half-cycle of classification after classification reaches a certain cycle, according to the navigation zone and the type of service; and
- b. at each end / beginning of a cycle, together with the Class Renewal Survey of Hull and Machinery.

##### 200. In-water Survey Hull and Machinery (VSC-VSM)

201. In-water survey hull and machinery are to be held by diving company homologated by RBNA at every half cycle of classification, until it reaches the cycle in which a dry-dock survey is mandatory.

#### E5. PROPELLER SHAFT SURVEY (VEP)

##### 100. Propeller shafts

101. This survey is to be carried out at the end of each final classification cycle.

#### E6. OTHER SURVEYS

##### 100. Thickness measurement of anchor chains.

101. To be carried out in the end of every the cycle of classification after the 2nd cycle.

##### 200. Engine overhaul/repair.

201. To be carried out according to the manufacturers' recommendations.

**300. Rudder stock.**

301. To be carried out at the end of each cycle of classification after the 2nd cycle.

**E7. CLASS RENEWAL SURVEY**

**100. Class renewal survey Hull and Machinery**

101. Class renewal surveys of hull and machinery are held at each end / beginning of a cycle of class. Such surveys require dry docking and thickness measurements of the hull structure.

102. Class renewal surveys are referred to as Class renewal survey no. "x", where "x" corresponds to the cycle of class.

**E8. OCCASIONAL SURVEYS**

**100. Occasional survey of hull and Machinery in Dry Dock and/or Floating (VOC-VOM)**

101. The occasional surveys of hull and machinery in dry dock and/or floating (VOC, VOM) are carried out where the ship has sustained damage; the vessel should be inspected immediately after the occurrence, or in cases of planned alterations. In both situations the repair and/or work will be supervised by the surveyors of RBNA in order maintain the hull and/or machinery class.

**E9. PERIODICAL SURVEYS FOR SPECIAL SERVICE SHIPS**

**100. Chemical tankers.**

101. Annual, intermediate and renewal surveys are to be carried out at the same time as the conventional surveys for the Class maintenance.

102. Surveys will be carried out in accordance with the IBC Code provided in Part I, Title 02, Section 2, Chapter G.

**200. Liquid gas carriers**

201. Annual, intermediate and renewal surveys are to be carried out at the same time as the conventional surveys for the Class maintenance.

102. Surveys will be carried out in accordance with the Part I, Title 02, Section 2, Chapter H.

**CHAPTER F  
SPECIFIC SURVEYS**

CHAPTER CONTENTS

F1. SPECIFIC SURVEY FOR HOMOLOGATION OF WELDING PROCESS

F2. SPECIFIC SURVEY FOR QUALIFICATION OF WELDERS

F3. DESIGN AND TYPE APPROVAL – MANUFACTURERS APPROVAL

F4. SPECIFIC SURVEY FOR APPROVAL OF SERVICE SUPPLIERS

F5. SPECIFIC SURVEY FOR CLASSIFICATION OF MATERIALS

F6. SPECIFIC SURVEY FOR CLASSIFICATION OF EQUIPMENTS

F7. OTHER SPECIFIC SURVEYS

F8. CONTINUOUS MACHINERY SURVEY (CMS)

F9. PLANNED MAINTENANCE SCHEME (PMS) FOR MACHINERY

F10. ACCEPTANCE OF MANUFACTURER'S QUALITY CONTROL ASSURANCE SYSTEMS FOR WELDING CONSUMABLES

**F1. SPECIFIC SURVEY FOR APPROVAL OF WELDING PROCESS**

**100. Application**

101. This survey is carried out on shipbuilders and / or manufacturers who perform welding services of the items covered by the RBNA RULES.

**200. Validity**

201. The classification of the welding process is valid indefinitely, provided that it is carried out in the same conditions under which the approval was made.

**300. Specific surveys**

301. See Part III, Title 61, Section 2, Chapter F2 and F3.

## F2. SPECIFIC SURVEY FOR QUALIFICATION OF WELDERS

### 100. Application

101. This survey is carried out on welders employed by shipbuilders and / or manufacturers who perform welding services of the items covered by the RBNA RULES.

### 200. Validity

201. The qualification of welders is valid indefinitely, as long as the welder uses the same welding process that is classified and that is continuously tested in performing services for which it qualified. Otherwise, the qualification is valid for one year.

### 300. Specific surveys

See Part III, Title 61, Section 2, Chapter F5.

## F3. DESIGN AND TYPE APPROVAL – MANUFACTURERS APPROVAL

### 100. Approach

101. The manufacture of components in third parties is to have the presence of a RBNA surveyor to inspect the stages of the work and to witness the correct performance of the tests.

102. The manufacturers, for that end, will provide locations and safe conditions, including the provision of a programme previous to the beginning or the surveys containing the schedule of work, the preparations for and the inspections and tests to be carried out.

### 200. Conditions of supply

201. The conditions of supply will indicate the conditions for the classification and the Classification Society fees.

### 300. Surveys and Certificates

301. The components (materials and equipment) will be subject to a survey denominated Specific Component Survey, as per the present Chapter F. Upon satisfactory conclusion of the surveys and tests, the relevant Certificate is to be issued.

### 400. Definitions

401. **Product inspection:** process of evaluating the conformity of the product with applicable requirements through design approval, inspection of the product during the manufacturing process and / or the final product, including the tests required by the applicable requirements, type approval, production process approval.

402. **Unit / batch inspection:** inspections carried out on each unit or on one sample from a batch, required for the certification of the product.

403. **Design approval:** approval of the plans, specifications and documents related to the product to be certified which may be followed by a prototype approval at RBNA's discretion, whereby RBNA certifies that the subject product design is in conformity with the applicable requirements and can be used on specific applications.

404. **Type approval:** evaluation process verifying whether the manufacturer has enough capability to maintain the standard of quality for their products as required by the RBNA Rules for the Construction and Classification of Steel Ships for Open Sea Navigation and other rules and proceedings of the Society and/or any recognised national or international standards. Depending on the product and the production process, restriction may be applied which require further inspections / tests to be applied to the final product.

405. **Manufacturer's approval:** evaluation process whereby the manufacturer's production process and capability are confirmed by RBNA through documentation review, approval testing and verification of the production processes.

406. **Sample:** a representative product used for tests and inspections. The selected sample is to be representative in all aspects of materials, production, heat treatment, etc. of the product series to be certified.

407. **Sample Test:** testing of the sample through specified methods to determine compliance with all requirements of the applicable rules / standards. In some cases, this sample test may be a destructive test.

408. **Prototype:** a model product manufactured to the design which is to be evaluated for compliance.

409. **Prototype test:** testing and measuring a prototype for evaluation of the product design. This testing may be destructive.

410. **Audit:** systematic and independent examination to determine whether quality activities and related results are in conformity with the planned arrangements and whether these arrangements have been implemented effectively.

411. **Service Suppliers:** Firms providing services on behalf of the owner of a ship or a mobile offshore unit, such as measurements, tests or maintenance of safety systems and equipment, the results of which are used by Surveyors in making decisions affecting

### 500. Submission of documents

501. Manufacturers shall apply in writing to RBNA for approval.

502. The following documents are to be submitted to the Society for review:



- a. Outline of company, e.g. organization and management structure, including subsidiaries to be included in the approval/certification
- b. Lay out of the facilities
- c. Description of the facilities, including inspection and testing installations
- d. Materials and products for which approval is sought
- e. Flow chart of the manufacturing process for the products intended to be type approved including the method of manufacture, guide values for the chemical composition, condition in which the materials and products are to be supplied, properties and dimensions
- f. Description of quality control systems and standards
- g. Experience of the company in the specific service area
- h. List of operators/technicians/inspectors documenting training and experience within the relevant service area, and qualifications according to recognized national, international or industry standards, as relevant
- i. Data Book recording results of the final products
- j. Evidence of approval/acceptance by other bodies

#### 600. General requirements

601. **Design approval:** The Design Assessment Department analyses the plans and specifications for the product under certification to certify that the subject product design is in conformity with the applicable requirements and can be used on specific applications. Prototype testing may be required at RBNA's discretion, in agreement with the manufacturers. Upon satisfactory results, a Design Approval Certificate is issued.

602. **Approval of Test Program:** The Classification Society analyses the test program for the products to be certified.

603. **Auditing of the Manufacturer:** Upon reviewing the submitted documents with satisfactory result, the manufacturer is audited in order to ascertain that the manufacturer is duly organized and managed in accordance with the submitted documents, and that it is considered capable of conducting the services for which approval/certification is sought.

#### 604. Auditing of the Production Processes and Quality control Procedures:

- a. The audit on the manufacturing and quality control processes and procedures is to be carried out to verify whether the products are manufactured under stable operation within the quality control standards

previously established in this procedure and in the RBNA rules.

- b. The survey is to be scheduled so as to correspond with convenient stages of the production processes for sampling of materials, checking the productions stages of the product and final measurements and non-destructive tests, as well as the condition of safety for shipping.
- c. Equipment and facilities: The manufacturer shall have the necessary equipment and facilities for the service to be supplied. A record of the equipment used shall be kept. The record shall contain information on maintenance and calibration.
- d. Procedures: The manufacturer shall have documented work procedures covering all services supplied.
- e. Subcontractors: The manufacturer shall give information of agreements and arrangements if any parts of the services provided are subcontracted. Particular emphasis shall be given to quality management by the manufacturer in following-up of such subcontracts. Subcontractors providing anything other than subcontracted personnel or equipment shall also meet the requirements of this procedure.
- f. Certification is conditional on a practical demonstration of the specific service performance as well as satisfactory reporting being carried out.

#### 700. Quality System

701. The manufacturer shall have a documented system covering at least the following:

- a. code of conduct for the relevant activity
- b. maintenance and calibration of test equipment
- c. training programmes for operators/technicians/inspectors
- d. supervision and verification to ensure compliance with operational procedures
- e. recording and reporting of information
- f. quality management of subsidiaries and agents
- g. job preparation
- h. periodic review of work process procedures, complaints, corrective actions, and issuance, maintenance and control of documents

702. A documented Quality system complying with the most current version of ISO 9000 series and including the above items, would be considered acceptable.

## 800. Certification

801. Upon satisfactory completion of both the audit of the manufacturer and the processes of production the Society will issue a Certificate of Approval stating that the manufacturer's manufacturing processes have been found to be satisfactory and the products for which the type approval has been requested may be accepted and utilized by the Society's Surveyors in classification or statutory certification, as relevant. The Certificate shall clearly state that the type and scope of type approved products and any limitations or restrictions imposed. The manufacturer will also be included in the Society's records of approved product manufacturers, and the products in the Society's records of Type Approved products.

802. Renewal of the Certificate is to be made at intervals not exceeding three years by verification through audits that approved conditions are maintained. The validity may thereafter be extended for a further 3 years where it is demonstrated by repeat testing that the conditions under which the first approval was issued continue to be fulfilled.

803. Intermediate audits at one year interval are required by verification that original conditions are maintained.

804. Where several manufacturing plants are owned by a given company, each manufacturing plant is to be assessed and approved individually.

805. In case where any alteration to the certified service operation system of the manufacturer is made, such alteration is to be immediately informed to the Society. Re-audit may be required when deemed necessary by the Society.

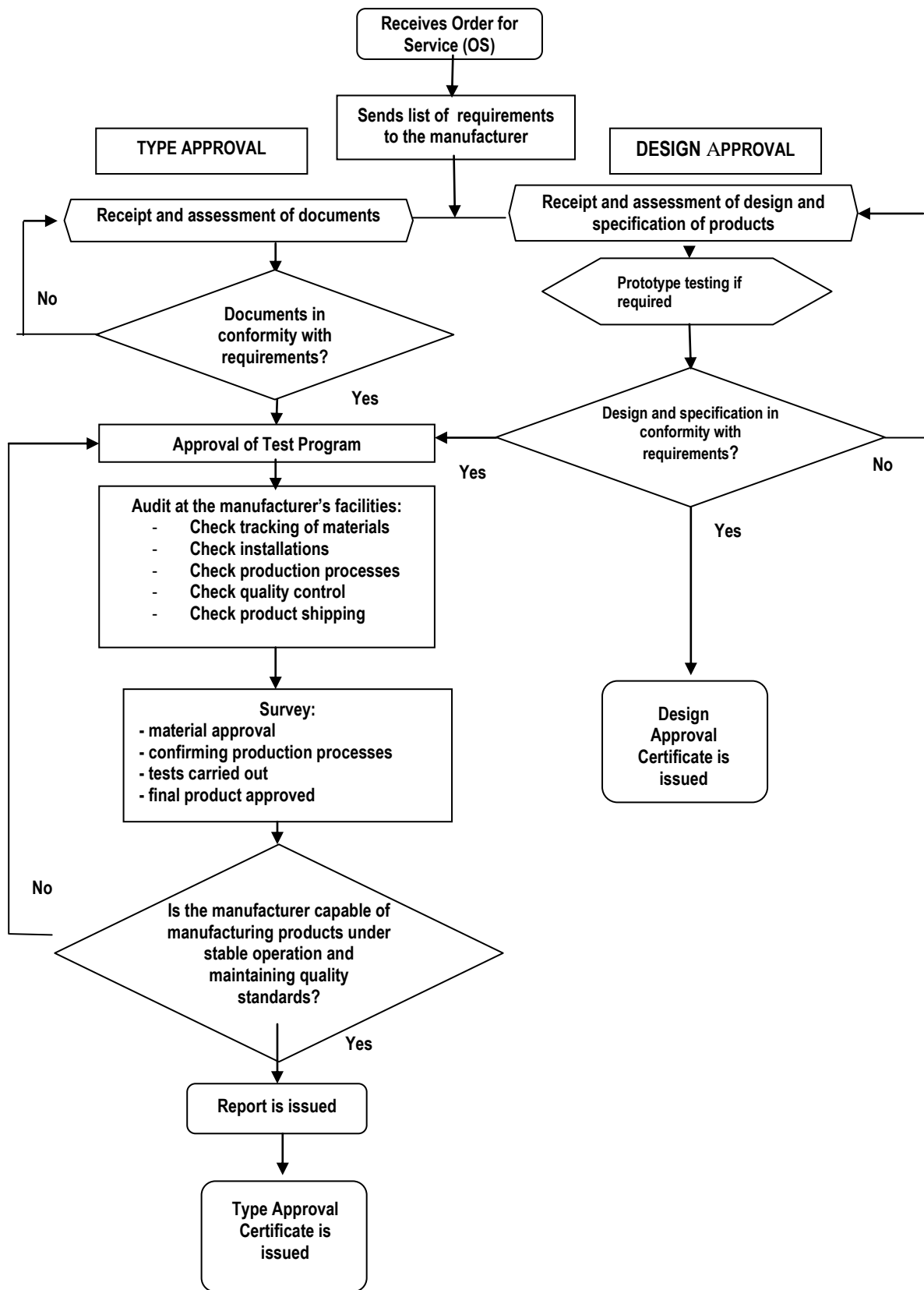
806. Approval may be cancelled in the following cases:

- a. When the manufacturer does not pay the approval fees
- b. When the steel castings of forgings whose manufacturing process have been granted approval no longer conform to the given requirements due to changes or implementation
- c. When the manufacturer does not take a proper action in case of recognized defects, shortcomings or other non-conformities after a Society recommendation.
- d. When the manufacturer has not carried out the renewal of the certificate.
- e. When a request for cancellation has been issued by the manufacturer.

807. A manufacturer whose approval was cancelled may apply for re-approval provided he has corrected the non-conformities which resulted in cancellation, and the Society is able to confirm he has effectively implemented the corrective action.



**FIGURE F.F3.601.1 - FLOW CHART MANUFACTURING PROCESS AND PRODUCT**



**F4. SPECIFIC SURVEY FOR APPROVAL OF SERVICE SUPPLIERS [IACS UR Z17]**

**100. Scope and application**

101. The objective of this subchapter F4 is to set basic standards for qualifying service suppliers.

102. This subchapter F4 applies to the approval of the following categories of service suppliers:

103. Class services

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

104. Statutory services

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

**200. General**

201. Firms providing services on behalf of the owner of a ship or a mobile offshore unit, such as measurements, tests or maintenance of safety systems and equipment and laboratories providing testing services, pending testing services, the results of which are used by Surveyors in making decisions affecting classification are subject to approval by the Society in accordance with the mandatory requirements in this subchapter and F4.600..

202. Where such services are used by Surveyors in making decisions affecting statutory certifications, the firms are subject to approval by the Society where the Society is so authorised by the relevant flag Administration. For such services the Society may accept approvals done by:

- a. the flag Administration itself,
- b. duly authorized organizations acting on behalf of the flag Administration, or
- c. other organizations that are acceptable to the flag Administration (e.g. other governments, etc.).

203. In the following text, such firms are referred to as “suppliers”.

204. Detailed requirements specific to the various categories of suppliers are given in F4.600. National and/or international requirements may give additional requirements. Reference to such national and/or international requirements are given in F4.600 below.

**300. Submission of documents**

301. The following documents are to be submitted to the Society for review. General requirements concerning suppliers are given in F4.401 to F4.409, and specific requirements as relevant, in F4.600.

- a. Outline of company, e.g. organization and management structure, including subsidiaries to be included in the approval/certification
- b. List of nominated agents
- c. Experience of the company in the specific service area
- d. List of operators/technicians/inspectors documenting training and experience within the relevant service area, and qualifications according to recognized national, international or industry standards, as relevant
- e. Description of equipment used for the particular service for which approval is sought;
- f. A guide for operators of such equipment
- g. Training programmes for operators/technicians/inspectors;

- h. Check lists and record formats for recording results of the services referred to in F4.200;
- i. Quality Manual and/or documented procedures covering requirements in F4.412;
- j. Evidence of approval/acceptance by other bodies, if any;
- k. Information on the other activities which may present a conflict of interest;
- l. Record of customer claims and of corrective actions requested by certification bodies;
- m. Where relevant, list and documentation of licenses granted by equipment's manufacturer.

**400. Requirements for approval and certification of the suppliers**

401. **Extent of Approval** – The supplier shall demonstrate, as required by F4.402 to F4.409 below, that it has the competence and control needed to perform the services for which approval is sought.

402. **Training of personnel** – The supplier is responsible for the qualification and training of its personnel to a recognised national, international or industry standard as applicable. Where such standards do not exist, the supplier is to define standards for the training and qualification of its personnel relevant to the functions each is authorised to perform. The personnel shall also have an adequate experience and be familiar with the operation of any necessary equipment. Operators/technicians/inspectors shall have had a minimum of one year tutored on-the-job training. Where it is not possible to perform internal training, a program of external training may be considered as acceptable.

403. **Supervision** – The supplier shall provide supervision for all services provided. The responsible supervisor shall have had minimum two years' experience as an operator/technician/inspector within the activity for which the supplier is approved. For a supplier consisting of one person, that person shall meet the requirements of a supervisor.

404. **Personnel records** – The supplier shall keep records of the approved operators / technicians / inspectors. The record shall contain information on age, formal education, training and experience for the services for which they are approved.

405. **Equipment and facilities** – The supplier shall have the necessary equipment and facilities for the service to be supplied. A record of the equipment used shall be kept. The record shall contain information on maintenance and calibration.

406. **Procedures** – The supplier shall have documented work procedures covering all services supplied.

407. **Subcontractors** – The supplier shall give information of agreements and arrangements if any parts of the services provided are subcontracted. Particular emphasis shall be given to quality management by the supplier in following-up of such subcontracts. Subcontractors providing anything other than subcontracted personnel or equipment shall also meet the requirements of F4.401 to F4.409 and F4.412.

408. **Verification** - The supplier shall verify that the services provided are carried out in accordance with approved procedures.

409. **Reporting** – The report shall be prepared in a form acceptable to the Society. Special guidelines may be given in F4.600 below. The report shall include a copy of the Certificate of Approval.

410. **Auditing of the Supplier** – Upon reviewing the submitted documents with satisfactory result, the supplier is audited in order to ascertain that the supplier is duly organized and managed in accordance with the submitted documents, and that it is considered capable of conducting the services for which approval/certification is sought.

411. **Certification** is conditional on a practical demonstration of the specific service performance as well as satisfactory reporting being carried out.

412. **Quality system:** The supplier shall have a documented system covering at least the following:

- a. code of conduct for the relevant activity;
- b. maintenance and calibration of equipment;
- c. training programmes for operators/technicians/inspectors;
- d. supervision and verification to ensure compliance with operational procedures;
- e. recording and reporting of information;
- f. quality management of subsidiaries and agents;
- g. job preparation;
- h. periodic review of work process procedures, complaints, corrective actions, and issuance, maintenance and control of documents.

413. A **documented Quality system** complying with the most current version of ISO 9000 series and including the above items, would be considered acceptable.

**414 Service Suppliers Relations with the Equipment Manufacturer:**

- a. A company which works as a service station for manufacturer(s) of equipment (and as a service supplier in this field), shall be assessed by the

manufacturer(s) and nominated as their agent. The manufacturer shall ensure that appropriate instruction manuals, material etc. are available for the agent as well as of proper training of the agent's technicians. Such suppliers shall be approved either on a case by case basis, or in accordance with F4.414.b below.

- b. If a manufacturer of equipment (and service supplier) applies to a Society for inclusion of his nominated agents and/or subsidiaries in the approval, then he must have implemented a quality system certified in accordance with the most current version of ISO 9000 series, with effective controls of his agents and/or subsidiaries, and when these agents/subsidiaries have an equally effective quality system complying with the most current version of ISO 9000 series. Such approvals shall be based upon an evaluation of the quality system implemented by the parent company against the most current version of ISO 9000 series. The Society may require follow-up to confirm adherence to this quality system by performing audits on such agents or subsidiaries against the most current version of ISO 9000 series.

#### 500. Certification

501. Upon satisfactory completion of both the audit of the supplier and the demonstration test, if required, the Society will issue a Certificate of Approval stating that the supplier's service operation system has been found to be satisfactory and that the results of services performed in accordance with that system may be accepted and utilized by the Society's Surveyors in making decisions affecting classification or statutory certification, as relevant. The Certificate shall clearly state that the type and scope of services and any limitations or restrictions imposed. The supplier will also be included in the Society's records of approved service suppliers.

502. Renewal or endorsement of the Certificate is to be made at intervals not exceeding five years by verification through audits that approved conditions are maintained. Individual Societies may require renewal or endorsement of the Certificate at intervals shorter than five years and may require intermediate audits. For firms engaged in thickness measurements, renewal/endorsement of the Certificate is to be made at intervals not exceeding 3 years by verification that original conditions are maintained.

503. Where several servicing stations are owned by a given company, each station is to be assessed and approved except as specified in this Chapter D3 item 414b.

504. In case where any alteration to the certified service operation system of the supplier is made, such alteration is to be immediately informed to the Society. Re-audit may be required when deemed necessary by the Society.

505 Approval may be cancelled in the following cases:

- a. Where the service was improperly carried out or the results were improperly reported.

- b. Where a Surveyor finds deficiencies in the approval service operation system of the supplier and appropriate corrective action is not taken.
- c. Where the supplier fails to inform of any alteration to the Society.
- d. Where intermediate audit if requested has not been carried out.
- e. Where wilful acts or omissions are ascertained.

506. The Society reserves the right to cancel the approval and to inform the IACS Members accordingly.

507. A supplier whose approval was cancelled may apply for re-approval provided he has corrected the non-conformities which resulted in cancellation, and the Society is able to confirm he has effectively implemented the corrective action.

508. **Existing Approvals:** Approvals granted before the date of implementation of the 2012 Edition of the Rules may remain valid as stated in the respective certificates for a period up to but not exceeding 3 years. Renewals of such certificates have to be carried out in accordance with the 2012 Edition of the Rules.

#### 600. Special Requirements for Various Categories of Service Suppliers

##### 601. Firms engaged in thickness measurements on ships

- a. **Extent of engagement** – Thickness measurement of structural material of ships except non-ESP ships less than 500 gross tonnage and all fishing vessels.
- b. **Supervisor** – The responsible supervisor shall be qualified according to a recognized national or international industrial NDT standard (e.g. EN 473 level II or ISO 9712 level II).
- c. **Operators** – The operators carrying out the measurements shall be certified to a recognised national or international industrial standard (e.g. EN 473 level I or ISO 9712 level I) and shall have adequate knowledge of ship structures sufficient to elect a representative position for each measurements.
- d. **Equipment** – On coated surfaces, instruments using pulsed echo technique (either with oscilloscope or digital instruments using multiple echo, single crystal technique) are required. Single echo instruments may be used on uncoated surfaces, which have been cleaned and grinded.
- e. **Procedures** – Documented work procedures are at least to contain information on survey preparation, selection and identification of test locations, surface preparation, protective coating preservation, calibration checks, and report preparation and content.

- f. **Reporting** – The report shall be based on the guidelines given in Part I Title 02 Section 2 Chapter B to I , as relevant.

*Guideline:*

*Chapter B: Procedures and scope of surveys for vessels having  $GT < 500$ ;*

*Chapter C: Procedures and scope of surveys for vessels having  $GT \geq 500$ ;*

*Chapter D: Procedures and scope of surveys for general cargo vessels having  $GT \geq 500$ ;*

*Chapter E: Additional requirements for hull surveys of single and double skin bulk carriers having  $GT \geq 500$ ;*

*Chapter F: Additional requirements for hull and cargo machinery surveys of single skin and double skin oil tankers having  $GT \geq 500$  ;*

*Chapter G: Additional requirements for hull and machinery surveys of chemical tankers;*

*Chapter H: Additional requirements for hull and machinery surveys of liquid gas carriers;*

*Chapter I: Additional requirements for surveys on Ro-Ro vessels.*

*Each one of these vessels has a different set of thickness measurement report forms, and a different set of requirements for surveys.*

*Please refer to the chapters above for further requirements, specific for each type of vessel.*

*End of guideline*

- g. **Verification** – The supplier must have the Surveyor’s verification of each separate job, documented in the report by his signature.

**602. Firms engaged in tightness testing of hatches with ultrasonic equipment**

- a. **Extent of engagement** – Ultrasonic tightness testing of hatches
- b. **Operators** – The operator is to have the following qualifications:
- b.1. Have knowledge of different hatch designs, their functioning and sealing features
- b.2. Have experience with operation and maintenance of different hatch designs
- b.3. Be able to document a theoretical and practical training on board in using ultrasonic equipment specified

- c. **Equipment** – The ultrasonic equipment to be used shall be type approved by the Society. It shall be demonstrated for the Surveyor that the equipment is fit for the purpose of detecting leakages in hatch covers.

- d. **Procedures** – The supplier shall have documented work procedures which shall include the manual for the ultrasonic equipment specified, its adjustment, its maintenance, its operation and approval criteria.

**603. Firms carrying out in-water survey of ships and mobile offshore units**

- a. **Extent of engagement** – In-water survey of ships and mobile offshore units.

- b. **Training of personnel** – The supplier is responsible for the qualification of its divers and the diving equipment utilised when carrying out survey. Knowledge of the following shall be documented:

- b.1. Ship’s underwater structure and appendages, tail shaft, propeller, rudder and its bearings, etc.
- b.2. Non-destructive testing in accordance with a recognised national or international industrial NDT standard. This requirements only applies if an in-water survey company performs non-destructive testing;
- b.3. Bearing clearance measurements on rudders and tail shaft
- b.4. Under-water video monitoring with TV-monitors on deck, as well as still picture work
- b.5. Operation of under-water communication system
- b.6. Special equipment and tools like hull cleaners, grinders, cutters, etc.

- c. **A plan for training of personnel** in the reporting system, minimum Rule requirements for relevant ship types, ship’s underwater structure, measuring of bearing clearances, the recognition of corrosion damage, buckling and deteriorated coatings, etc. shall be included.

- d. **Supervisor** – The supervisor shall be qualified according to the supplier’s general requirements and shall have minimum two years’ experience as a diver carrying out survey.

- e. **Divers carrying out survey** – The diver carrying out the survey shall have had at least one year’s experience as an assistant diver carrying out survey (minimum 10 different assignments).

- f. **Equipment** – The following shall be available:



- f.1. Closed circuit colour television with sufficient illumination equipment
- f.2. Two-way communication between diver and surface staff
- f.3. Video recording device connected to the closed circuit television
- f.4. Still photography camera
- f.5. Equipment for carrying out thickness gauging, non-destructive testing and measurements, e.g. clearances, indents, etc. as relevant to the work to be performed.
- f.6. Equipment for cleaning of the hull
- g. Procedures and guidelines** – The supplier shall have documented operational procedures and guidelines for how to carry out the survey and how to handle the equipment. These shall include:
- g.1. Two-way communication between diver and surface
- g.2. Video recording and closed circuit television operation
- g.3. Guidance of the diver along the hull to ensure complete coverage of the parts to be surveyed
- h. Verification** – The supplier must have the Surveyor’s verification of each separate job, documented in the report by his signature.
- 604. Firms engaged in surveys and maintenance of fire extinguishing equipment and systems**
- a. **Extent of engagement** – The supplier shall have the professional knowledge of fire theory, fire fighting and fire extinguishing appliances sufficient to carry out the surveys and to make the necessary evaluations of the condition of the equipment.
- 605. Firms engaged in service of inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats**
- a. **Extent of engagement** – Servicing of inflatable liferafts, inflatable lifejackets, hydrostatic release units and/or inflatable rescue boats.
- b. **Equipment and premises** – IMO Res. A.761 (18) gives recommendations on conditions for the approval of servicing stations for inflatable liferafts which shall be observed as relevant.
- c. **Procedures and instructions** – The supplier shall have documented procedures and instructions for how to carry out service of equipment. The procedures should include requirements to record the nature and extent of damages to and defects found in equipment during servicing and repair work. This data shall be made available to the Society upon request.
- d. The supplier shall **provide evidence that it has been authorized or licensed** to service the particular makes and models of equipment for which approval is sought by the equipment’s manufacturer.
- 606. Firms engaged in the servicing and testing of radio communication equipment**
- a. **Extent of engagement** – Inspection, testing, and/or measurement of radio equipment aboard ships or mobile offshore units for compliance with SOLAS regulations.
- b. **Reference documents** – The supplier shall have access to SOLAS 1974 as amended, IMO Res. A.789 (19): Specification on the survey and certification functions of recognized organizations acting on behalf of the administration, ITU Radio Regulations, and IMO Performance Standards as well as relevant parts, if any, of the Society’s Rules and Guidelines.
- c. **Supervisor** – The supervisor shall have minimum two years education from a technical school and experience as an inspector, and should preferably hold a General Operator’s Certificate (GOC).
- d. **Radio inspector** – The inspector carrying out the inspection shall have passed the internal training of the supplier in Radiotelephony, GMDSS, and initial and renewal surveys, as applicable. The inspector shall also have at least one year’s technical school and at least one year experience as an assistant radio inspector.
- e. **Equipment**
- e.1. The supplier shall have the major and auxiliary equipment required for correctly performing the inspection. A record of the equipment used shall be kept. The record shall contain information on manufacturer and type of equipment, and a log of maintenance and calibrations.
- e.2. A standard which is relevant to the radio equipment to be tested shall be available for the equipment and shall be cited in the inspection report.
- e.3. For equipment employing software in the conjunction with testing/examination, this software shall be fully described and verified.
- f. **Minimum required instruments:**
- f.1. Equipment for measuring frequency, voltage, current and resistance

- f.2. Equipment for measuring output and reflect effect on VHF and MF/HF
- f.3. Equipment for measuring modulation on MF/HF and VHF (AM, FM, PM)
- f.4. Acid tester for checking specific gravity of lead batteries
- f.5. Tester for checking of correct output from Free-Float Satellite EPIRB
- g. **Procedures and instructions** – The supplier shall have documented procedures and instructions for how to carry out testing and examination of radio equipment. Procedures and instructions for operating of each item of the testing/inspection equipment shall also be kept and be available at all times.
- 607. Firms engaged in inspection and testing of centralised gas welding and cutting equipment**
- a. The supplier shall document and demonstrate that it has knowledge of gas welding, of associated central gas installation systems and of current safety requirements applicable to such equipment by national administrations, sufficient to carry out the inspection and testing and to make the necessary evaluations of the state of the equipment.
- 608. Firms engaged in surveys and maintenance of self contained breathing apparatus**
- a. The supplier shall document and demonstrate that it has knowledge of the equipment and systems sufficient to carry out the inspections and testing of self-contained breathing apparatus to identified standards and to make the necessary evaluation of the condition of the equipment.
- 609. Firms engaged in the examination of Ro-Ro ships bow, stern, side and inner doors**
- a. **Extent of engagement** - inspection of securing and locking devices, hydraulic operating system, electric control system for the hydraulics, electric indicator systems, and supporting, securing and locking devices and tightness testing.
- b. The supplier is to be certified to the most current version of ISO 9000 series.
- c. **Reference documents** - The supplier shall have access to SOLAS 1974 as amended and Part I, Title 02, Section 2, Chapter I by the Society.
- d. In addition to F4.403, the Senior Service Engineer (Supervisor) shall have a minimum two years education from a technical school.
- e. **Required Equipment**
- e.1. For Inspection of Supporting Securing and Locking Devices, Hinges and Bearings: Equipment for measuring clearances (i.e. feeler gauges, vernier calipers, micrometers) and Non-destructive examination (i.e. dye penetrant, magnetic particle inspection)
- e.2. For Tightness Testing: Ultrasonic leak detector or equivalent
- e.3. For Inspection of Hydraulic Operating System: Pressure gauges and Particle counter for analysing the quality of hydraulic fluid
- e.4. For Inspection of Electric Control System and Indication System: Digital multi-meter and Earth fault detector
- f. **Procedures and Instructions**
- f.1. The supplier shall have access to drawings and documents, including the Operating and Inspection Manual.
- f.2. The supplier shall have access to the service history of the doors.
- f.3. The supplier should use, complete and sign a checklist which has been found acceptable by the classification society.
- 610. Firms engaged in annual performance testing of Voyage Data Recorders (VDR)**
- a. **Extent of engagement** – Testing and servicing of Voyage Data Recorders (VDR) in accordance with SOLAS Chapter V Regulation 18.8.
- b. The supplier shall provide evidence that he has been **authorized** or licensed by the equipment’s manufacturer to service the particular makes and models of equipment for which approval is sought.
- c. **Documentation and Equipment** – The supplier shall have access to IMO Resolution A.861(20) and applicable industry **performance** standard (e.g., IEC 61996), and have documented procedures and instructions. In addition the supplier shall have documentation and equipment as specified in the authorization or license from the equipment manufacturer.
- d. **Test Report** - The supplier shall issue a certificate of compliance as specified in SOLAS Chapter V Regulation 18.8.
- 611. Firms engaged in surveys of low location lighting systems using photo luminescent materials**
- a. **Extent of engagement** – Luminance measurements on board ships of low location lighting systems using photo luminescent materials.

- b. **Operators** – The operator is to have the following qualifications: have adequate knowledge of the applicable international requirements (namely SOLAS reg. II-2/13.3.2.5, IMO Res. A.752(18), ISO 15370-2001, FSS Code Chapter 11) and be able to document a theoretical and practical training onboard in using equipment specified.
- c. **Equipment** – The measuring instrument shall incorporate a fast-response photometer head with CIE (International Commission on Illumination) photopic correction and have a measurement range of at least  $10^{-4}$  cd/m<sup>2</sup> to  $10^{-2}$  cd/m<sup>2</sup>.
- d. **Procedures** – Documented work procedures are at least to contain information on survey preparation, selection and identification of test locations.
- e. **Reporting** – The report shall conform to Annex C of ISO 15370-2001.
- f. **Verification** – The supplier must have the Surveyor’s verification of each separate job, documented in the report by his signature.

**612. Firms engaged in sound pressure level measurements of public address or general alarm systems on board ships**

- a. **Extent of engagement** – Sound pressure level measurements of public address and general alarm systems on board ships.
- b. **Operators** – The operator is to have the following qualifications: have adequate knowledge of the applicable international requirements (SOLAS Reg. III/4 and III/6, LSA CODE Chapter VII/7.2, IMO Code on alarms and indicators, 1995) and be able to document a theoretical and practical training onboard in using equipment specified.
- c. **Equipment** – The measuring instrument shall be an integrating sound level meter with frequency analyser capabilities complying with IEC (International Electrotechnical Commission) 60651 and IEC 60804, type 1 precision class with, at least an Aweighting frequency response curve and 1/3 octave and 1 octave band filters, complying to IEC 61260, as appropriate for the measurements to be carried out. In addition microphones shall be of the random incidence type, complying with IEC 60651.
- d. **Procedures** – Documented work procedures are at least to contain information on survey preparation, calibration, selection and identification of test locations.
- e. **Reporting** – The report shall describe, as a minimum, the environmental conditions of the tests and, for each test location, the ambient noise level or the speech interference level, as appropriate for the measurements

to be carried out. The report shall conform to any other specific requirement of the Society.

- f. **Verification** – The supplier must have the Surveyor’s verification of each separate job, documented in the report by his signature.

**613. Firms engaged in testing of coating systems in accordance with IMO resolution MSC.215 (82) and/or IACS UI SC223 and/or MSC.288 (87)**

**a. Laboratories**

- a.1. **Extent of Engagement** - Testing of coatings systems in according to IMO Resolution MSC.215(82) and IACS IS SC223 and/or MSC.288(87).
- a.2. The laboratories is to provide to the Society the following information:
- i. A detailed list of the Laboratory test equipment for the IMO Resolution MSC.215(82) and/or MSC288(87) coating approval.
  - ii. A detailed list of reference documents comprising a minimum those referred to in MSC.215(82) and/or MSC288(87) that are available in the laboratory.
  - iii. Details of testing panel preparation, procedure of test panel identification, coating application, test procedures and a sample test report.
  - iv. Details of exposure method and site for weathering primed test panels.
  - v. A sample daily or weekly log/form for recording test condition and observations including unforeseen interruption of the exposure cycle with corrective actions.
  - vi. Details of any sub-contracting agreements (if applicable).
  - vii. Comparison test report with an approved coating system or laboratory if available.

**b. Reporting** – Reference is made to the following IACS Recommendations:

- b.1. Rec. 101: IACS Model Report for IMO Resolution. MSC.215(82) Annex 1 “Test Procedures for Coating Qualification”
- b.2. Rec. 102: IACS Model Report for IMO Resolution MSC.215(82) Annex 1 “Test



Procedures for Coating Qualification”, Section  
1.7 – Crossover Test

- c. **Audit of the test laboratory** is to be based on this procedure and the standards listed in the IMO Resolution MSC.215(82) and/or MSC288(87).

**614. Firms engaged in testing navigational equipment and systems.**

- a. Firms engaged in the testing of navigational equipment and systems are not required to be approved as service suppliers. However, it is recommended that the classification society/recognised organisation concerned be guided by the following when seeking or approving assistance for the surveyor during initial, annual, periodical or renewal surveys of navigational systems and equipment covered by IMO Records of Equipment for the SOLAS Safety Certificates (Forms P, C and E), i.e. navigational equipment required by SOLAS Reg. V/19. The forms are attached for information.
- b. Firms should be approved for the ‘functional level’ and not for the ‘manufacturer level’. Approval of firms by classification societies does not include the ability to service the equipment down to the ‘manufacturer level’.
- c. If a firm is not able to cover all groups of navigational equipment the groups of equipment for which the firm is approved should be listed on any certificate issued.
- d. **Process**
- d.1. **Item 1: Extent of engagement:** Performing inspection and testing of navigational equipment and systems on board ships for compliance with SOLAS requirements. The service supplier engagements are divided into 5 groups of services. Preferably, the service supplier should seek approval for all of these groups in order to be approved as service supplier for navigational equipment and systems. Approval of service suppliers according to a limited number of groups may be considered on a case by case basis.
- d.2. **Item 2: Reference documents:** The service supplier should have access to SOLAS Ch. V and all IMO Performance Standards relevant for each group of services as well as all IEC cross product standards (IEC 60945 and IEC 61162 series). The IMO Performance Standards are listed under item 5. Where different flag states have their own interpretations or requirements regarding particular equipment or systems, these need to be part of the instructions / procedures, and arrangements for updating the validity of such interpretations / requirements should be in place.

- d.3. **Item 3: Personnel:** The service supplier should provide evidence that the person carrying out the inspection has education from a technical school (a minimum two years’ programme of engineering or physical science) or from a nautical institution with relevant seagoing experience as a certified ship’s officer. Personnel should be trained in testing navigational equipment and systems, preferably by the manufacturer of the equipment. Personnel should also have passed training concerning initial, annual, periodical and renewal surveys and have proficiency in the English language commensurate with the work. Personnel testing colour calibration on ECDIS should, in addition, have a documented Ishihara colour vision deficiency test or equivalent and have colour vision not worse than would be required for seagoing service as an officer.
- d.4. **Item 4: Procedures and instructions:** The supplier should have documented procedures and instructions for carrying out the testing and examination of navigational equipment and systems. Such procedures and instructions should ensure that the level of performance tests is in compliance with the relevant technical standards. The procedures should cover all types of equipment within the relevant group for which approval is sought. Dedicated checklists with appropriate pass criteria for each test / inspection should be available.
- d.5. **Item 5: Equipment / publications:** The service supplier should, as a minimum, have the applicable publications for the different groups of services. The supplier should have the major and auxiliary equipment (e.g. multi meter, earth fault finder, NMEA logger, AIS test set, sound generator, sound level meter, etc.) required for correctly performing the testing. A record of the test equipment used should be kept. The record should contain information on manufacturer and type of equipment, and a log of maintenance and calibrations.
- d.6. **Item 6: Reporting:** The service supplier should confirm by means of a documented report that the equipment has been tested satisfactorily.
- d.7. **Item 7: Review and Verification:** The surveyor should be on board to the extent necessary to control the process. The surveyor should confirm that no further testing is needed or specify additional testing. The surveyor should verify the report of the service supplier.

**615. Firms engaged in NDT of weldings [RBNA + IACS Rec 20]**

- a. Extent of engagement:** Detection of internal imperfections by means of ultrasonic testing (UT) and radiographic testing (RT) except non-ESP ships less than 500 gross tonnage and all fishing vessels.
- b. Supervisors:** Personnel responsible for the preparation and approval of NDT procedures should be qualified according to a **nationally recognised scheme** with a grade equivalent to **level III qualification** of ISO 9712, SNT-TC-1A, EN 473 or ASNT Central Certification Program (ACCP).
- c. Operators:** For each inspection method, operators should be qualified according to a nationally recognised scheme with a grade equivalent to **level II qualification** of ISO 9712, SNT-TC-1A, EN 473 or ASNT Central Certification Program (ACCP). Operators qualified to level I may be engaged in the tests under the supervision of personnel qualified to level II or III.
- d. Procedures:**
- d.1. **Liquid penetrant testing :** The procedure should detail as a minimum the calibration equipment, surface preparation, cleaning and drying prior to testing, temperature range, type of penetrant, cleaner and developer used, penetrant application and removal, penetration time, developer application and development time and lighting conditions during testing.
- d.2. **Magnetic particle testing:** The procedure should detail as a minimum the surface preparation, magnetizing equipment, calibration methods, detection media and application, viewing conditions and post demagnetization.
- d.3. **Radiographic testing:** The procedure should detail as a minimum the type of radiation source, considering the thickness to be radiographed, test arrangement and films overlapping, type and position of image quality indicators (IQI), image quality, film system and intensifying screens used if any, exposure conditions, scattered radiation control, film processing, film density and viewing conditions.

**F5. COMPONENT CERTIFICATION [IACS UR Z17]**

**100. Application**

101. This subchapter applies to the products (Construction Components) to be certified by RBNA.

102. Item F5.600 applies Classified Construction Components as required by ships classified by RBNA.

103. Subchapter F4 applies to Class and Statutory Service Suppliers, as required for statutory services to ships according to delegation from the Brazilian Maritime Authority to RBNA. In general, materials required by Statutory conventions and codes are to be inspected at manufacturers' according to the relevant codes and resolutions.

104. For the construction components to which this subchapter applies, RBNA will carry out an assessment of the manufacturer's facilities to determine the manufacturer's capability to produce the subject construction component.

105. The certification process is comprised of:

- a. Analysis of plans and specifications for conformity with the RBNA Rules and/or the relevant International or National Standards;
- b. Inspection and tests during the manufacturing of the construction component for compliance with the applicable Standards, RBNA Rules and approved plans;

106. For mass produced or for a large set of construction components, RBNA may accept sample tests within each batch or lot.

107. For type approval, see subchapter D1 above.

**200. Drawing approval**

201. The manufacturer is to submit the following documents in virtual files or in three hard copies for analysis and approval:

- a. The RBNA Rules;
- b. National or International Standards relevant to the item under assessment;
- c. Product specifications;
- d. Design drawings, including arrangements, details, materials, list of components, etc;
- e. Design calculations;
- f. Test reports of the product, if any;
- g. Inspection programme and acceptance criteria;
- h. Other relevant documents.

202. Where the technical documents described in D2.201 above are in conformity with the RBNA will issue a notification and send one set of virtual or hard copies to the manufacturer, identifying the approval of the documents.

**300. Testing of materials**

301. The materials to be employed in the manufacturing of the construction component are to be submitted to mechanical tests and chemical analysis in accordance with the RBNA Rules. A chemical analysis processed by the manufacturer may be accepted by RBNA; however, RBNA reserves the right to carry out random checks.

#### 400. Inspections

401. The manufacturer is to assist the RBNA surveyor in the access to the several stages of production, as required.

402. The inspections will be carried out in accordance with the RBNA Rules and/or applicable Standards.

403. The final inspections are to be carried out in the presence of a RBNA surveyor.

#### 500. Certification

501. A Certificate will be issued for the construction component upon satisfactory completion of the design analysis and testing of the component.

#### 600. Classified Construction Components as required for ships classified by RBNA.

601. Table T.F5.601.1 lists the components as required for ships to be classified for ships certified by RBNA.

**TABLE T.D2.601.1 - CLASSIFIED CONSTRUCTION COMPONENTS AS REQUIRED FOR SHIPS CLASSIFIED BY RBNA**

RBNA ID Number	Material or equipment
<b>SECTION 2 - STRUCTURE</b>	
<b>2.1 Principles and materials</b>	
<b>2.1.4 Hull materials</b>	
214I01	Laminated steel plates and profile
214I02	Cast and forged parts
214I03	Aluminum
215I04	Reinforced plastic materials
215I05	Timber
<b>2.2. Welding and cutting</b>	
<b>2.2.2 Welding materials</b>	
222I01	Welding consumable
<b>SECTION 3. - EQUIPMENT</b>	
<b>3.2 – Mooring and towing</b>	
<b>3.2.1 - Anchor, chains, cables and accessories</b>	
321I02	Anchor
321I01	Anchor chains
321I03	Stoppers and accessories
<b>3.2.2 – Mooring, cables and accessories</b>	
322I01	Steel wire ropes, synthetic ropes and fibre ropes
<b>3.2.3 - Towing</b>	
323I01	Towing triangular plate
323I02	Shackles and pad eyes
323I03	Emergency towing arrangement
323I03	Towing hook
323I04	Towing winch
<b>3.2.4 - Equipment</b>	
321I04	Windlass
321I05	Capstan
324I03	Mooring winch
<b>3.3 - Steering system</b>	
<b>3.3.1 - Rudder and special rudder</b>	
331I01	Rudder, Special rudders (Steering Kort Nozzle)
<b>3.3.2 - Rudder stock and accessories</b>	
332I01	Rudder stock, flange, pintle, liners
332I02	Bearings
332I03	Sleeves
332I04	Bushing
332I05	Bolts
<b>3.3.3 - Steering gear</b>	
333I01	Steering gear: materials and accessories
333I02	Steering gear hydraulic units, pistons and pumps
333I03	Steering gear : electrical pumps
333I05	Rudder tillers, quadrant, guardrope, turnbuckles, quadrantes, gualdropes
333I06	Piping lines, valves and hydraulic hoses
<b>3.4 - Safety equipment and firefighting equipment and systems</b>	
<b>3.4.1 Safety equipment</b>	
341I01	Lifeboats
341I02	Rigid life rafts

RBNA ID Number	Material or equipment
341I03	Inflatable life rafts and hydrostatic release
341I04	Rescue boat
341I05	Life jackets
341I06	Life buoys
341I07	Pyrotechnics
341I08	Line throwing apparatus
<b>3.4.2 - Fire prevention and extinction</b>	
342I01	CO2 fixed system
342I02	Smoke, heat and flame detectors
342I03	Fire extinguishers
342I04	Sprinkler systems
342I05	Foam systems
<b>3.6 - Hull accesses and protections</b>	
<b>3.6.1- Hatch covers</b>	
361I01	Hatch cover panels
361I02	Opening and closing systems
361I03	Hatch cover accessories
<b>3.6.2 - Side scuttles, Watertight door, skylights, hull closing</b>	
362I03	Side scuttles, windows, skylights and deadlight
362I04	Watertight door
362I05	Bow, stern and side doors
<b>SECTION 4 - ACCOMMODATION</b>	
<b>4.2.1 Approved materials</b>	
421I01	Thermal / acoustic insulation and fixing
421I02	Internal bulkheads, ceiling and linings
421I03	Anti-flame decoration materials
<b>SECTION 5 - MACHINERY</b>	
<b>5.2 - Propulsion engine</b>	
<b>5.2.0 - General</b>	
520I01	Main Combustion Engine
520I02	Electric propulsion engine
520I03	Gas driven engine
520I04	Dual fuel engines
<b>5.2.3 Fixing</b>	
523I02	ME fixing bolts
<b>5.2.5 - Components</b>	
525I01	ME casing
525I02	Tie rods
525I03	Cylinder heads
525I04	Liners
525I05	Piston arrangement
525I06	Crosshead arrangement
525I07	Moving and fixed bearings
525I08	Camshaft
525I09	Fuel oil system
525I10	Combustion air cooler
525I11	Scavenging air
525I12	Combustion air blower
525I13	Turbo charger
525I14	Starting air
525I15	Crankcase explosion relief device
<b>5.3.- Propulsion transmission</b>	
<b>5.3.3 - Shaftline , couplings, liners, bushes and bearings</b>	
533I01	Tail shaft

RBNA ID Number	Material or equipment
533I02	Intermediate shaft
533I03	Shaft liners
533I04	Bearings
533I05	Bushes
533I06	Couplings and elastic couplings
533I07	Coupling bolts
<b>5.3.4 Stern tube and bearings</b>	
534I01	Stern tube
534I02	Bushes
<b>5.3.1 Reduction gear box</b>	
531I01	Reduction gear
<b>5.3.1 - Coupled systems</b>	
531I03	Power takeoff
<b>5.4 Propulsion</b>	
<b>5.4.1 Propellers</b>	
541I01	Fixed pitch propellers
541I02	Controllable pitch propellers
<b>5.4.2 Other Systems</b>	
542I03	Water jet propulsion
542I01	Azimuthal propulsion
542I02	Bow thruster
<b>5.5 Auxiliary Engines</b>	
<b>5.5.2 - Auxiliary engines instruments</b>	
552I02	Monitoring and controls instruments
<b>5.5.1 – Engine group and other</b>	
551I01	Auxiliary engines for generators
<b>SECTION 6 PIPING</b>	
<b>6.1 Conception</b>	
<b>6.1.3 – Piping materials – Pipes and accessories</b>	
613I01	Pipes Class I and II
613I02	Pipes class III
613I03	High pressure piping
613I04	Mechanical pipe joint
613I05	Uncoated pipes
613I06	Galvanized pipes
<b>6.1.4 - Piping materials - valves</b>	
614I01	Classified valves
614I02	PV valves
<b>6.2 Cargo piping</b>	
<b>6.2.2 - Hydrocarbons</b>	
622I01	Cargo pumps
622I02	Cargo tanks washing pumps
<b>6.2.3 - Chemical products</b>	
623I01	Cargo pumps
623I02	Cargo tanks washing pumps
623I03	Condensers
<b>6.2.5 - Liquefied gases in bulk</b>	
625I01	Independent cargo tanks
625I02	Pumps
625I03	Compressors
<b>6.3 – Hull piping</b>	
<b>6.3.1 Bilge system, fire system and general service system</b>	
613I00	Piping lines
<b>6.3.2Drains, scuppers, bottom plugs.</b>	
632I00	Drains
632I00	Scuppers
632I00	Bottom plugs
<b>6.3.3 - Inert gas</b>	

RBNA ID Number	Material or equipment
633I01	Piping lines
<b>6.3.4 - Air vent heads</b>	
634I01	Air vent heads
<b>6.3.5 - Fresh water for accommodation</b>	
635I01	Pumps
635I02	Hydrophor tanks
<b>6.3.6 - Ventilation and exhausting</b>	
636I01	Ventilators / exhausters
636I02	Explosion proof ventilators and exhausters
<b>6.3.7 - Air conditioning</b>	
637I01	Pumps
637I02	Compressors
637I03	Accessories
<b>6.4 – Machinery systems, piping and accessories</b>	
<b>6.4.1- Fuel oil system</b>	
641I01	Pumps
641I02	FO heaters
641I03	Purifier
<b>6.4.3 - Lube oil system</b>	
643I01	Pump LO
643I02	Heater LO
643I03	Cooler LO
643I04	Centrifuge LO
<b>6.4.4 - Cooling water</b>	
644I01	FW Pump
644I02	Cooler
644I03	Heater
644I04	Harbour pump
<b>6.4.5 - Vapour</b>	
645I01	Condenser
645I02	Thermal oil and thermal water units
645I04	Boilers
654I05	Boiler burners
654I06	Economizer
<b>6.4.7 - Starting air</b>	
647I01	Main air compressor
647I02	Emergency air compressor
647I03	Starting air bottle
647I04	Emergency air bottle
647I05	Automatic safety devices
<b>6.4.8 - Feed water</b>	
648I01	Piping
648I02	Pump
<b>6.5 Anti Pollution</b>	
<b>6.5.1 - Oily water</b>	
651I01	Bilge piping lines
651I02	Bilge pump
654I01	Sludge pump
654I02	Oily water separator
<b>6.5.2 - Garbage treatment</b>	
655I01	Garbage treatment unit
<b>6.5.3 - Sanitary water</b>	
654I01	Pump
654I02	Sewage treatment unit
<b>SECTION 7 ELECTRICITY</b>	
<b>7.2 - Generation and accumulation</b>	
<b>7.2.1 - Generators</b>	

RBNA ID Number	Material or equipment
721I01	Main generator
721I02	Emergency generator
721I03	Shaft generator
<b>7.2.3 – Accumulators, Battery chargers</b>	
723I01	Battery
723I02	Battery chargers
<b>7.3 - Distribution and protection</b>	
<b>7.3.1 - Power switchboards</b>	
731I01	Main electric switchboard
731I02	Engine room main operating console
731I03	CCM room main operating console
731I04	Bridge central operating console
731I05	Uninterrupted power supply (UPS)
<b>7.3.2 - Illumination system</b>	
732I01	Light switchboard
732I02	Navigation lights switchboard
732I03	Explosion proof joint and switch box
732I03	Explosion proof lights
<b>7.3.3 - Emergency system</b>	
733I01	Emergency power switchboard
733I02	Emergency distribution switchboard
<b>7.3.4 - Transformers</b>	
734I01	Transformers
<b>7.3.5 - Electric cables</b>	
735I01	Electric cables
735I02	armoured cables
735I03	intrinsically safe cables
<b>7.3.7 - Cable trays</b>	
737I01	Electric cable support
<b>7.4 - Utilizers</b>	
<b>7.4.1 - Electric motors, command and control</b>	
741I01	Electric motors
741I02	Explosion proof electric motors
741I03	Intrinsically safe electric motors
741I04	Starting panels
741I05	Control devices
<b>7.4.2. - Luminaries</b>	
742I01	Lighting fixtures and accessories
742I02	Explosion proof lighting fixtures and accessories
<b>7.4.3 - Electric devices</b>	
744I01	Electric devices of the galley, pantry and laundry.
<b>SECTION 8. NAVIGATION AND ELECTRONICS</b>	
<b>8.1 Navigation</b>	
<b>8.1.1 - Navigation lights and signaling</b>	
811I01	Navigation lights
<b>8.1.2 - Positioning systems</b>	
812I01	Magnetic compass
812I02	Gyro compass
812I03	GPS
812I04	Dynamic positioning systems
812I05	Auto-pilot
<b>8.1.3 - Prospection systems</b>	
813I01	Echo sounder
813I02	Radar



RBNA ID Number	Material or equipment
<b>8.2 Communication</b>	
<b>8.2.1 – Radio</b>	
831I01	MF/HF, VHF
831I02	EPIRB
821I03	SART
<b>8.2.2 Navitex, Inmarsat</b>	
831I03	Navitex
831I04	Inmarsat
<b>8.2.3 Internal communication</b>	
833I01	Internal communication
<b>8.2.4 Other</b>	
824I01	Clinometer
331I03	Rudder angle indicator
522I01	Engine telegraph
<b>8.3 Signalization</b>	
<b>8.3.1 Sound devices</b>	
823I01	Bell, gong, whistle
<b>8.3.2 Luminous devices</b>	
822I01	Rockets, throwing apparatus
<b>8.4Automation</b>	
<b>8.4.1 Monitoring and alarm system</b>	

## F6. SURVEYS FOR CLASSIFICATION OF SPECIFIC EQUIPMENT

### 100 Application

101. The survey for classification of equipment, including machinery, will be performed at the manufacturers' and / or shipyards to monitor the manufacturing and testing, including bench tests where applicable, essential machinery and equipment based on the compliance with the requirements of the Rules and / or technical standards in force.

### 200. Boiler Survey

201. In principle, the survey of boilers are to be carried out in the periods specified by NR13, which are to be found in Part I, Title 02, Section 02, subchapter C8.

### 300. Pressure Vessel Surveys

301. The survey of pressure vessels will be performed simultaneously with the Intermediate and Renewal Class renewal. Reference is made to the ASME VIII standards.

### 400. Inert gas system surveys

401. The inert gas surveys are performed at every 12 months beginning from the date of the ship entrance in service or the date of the survey of admission to Class. See Part I, Title 02, Section 02, Chapter F2 and . shall be coincident with the Annual, Intermediate and Renewal surveys of machinery

### 500. Automation system surveys

501. The Annual, Intermediate and Renewal surveys of the Automation System shall be coincident with the Annual, Intermediate and Renewal surveys of machinery.

### 600. Refrigeration system surveys

601. The refrigeration system surveys shall be performed at every 12 months intervals starting from the date of the ship entrance in service or the date of the survey of admission to Class.

## F7. OTHER SPECIFIC SURVEYS

### 100. Application

101. Other specific surveys shall be performed as determined by the administration of RBNA in special cases, for example, compliance with requirements for hull and / or machinery which has been given a deadline for compliance

### 200. Surveys of ships "Out of Service Class" (laid-up)

201. Upon request of the Owner, a ship can remain out of operation for a period not exceeding the validity date of certificates subject to a special program of inspections, as follows:

202. **Survey of deactivation:** Surveys to be carried on the vessel based on the criteria and recommendations of the Guide to Special Condition "Class Out of Service" issued by RBNA for entry into condition out of service.

203. **Periodical surveys for maintenance of class in condition out of service:** Surveys to be performed every 12 months based on the criteria and recommendations Guide to Special Condition "Class Out of Service" issued by RBNA to verify that the vessel remains within the minimum standards of maintenance and preservation necessary for the maintenance of class.

204. **Survey for reactivation of class:** Surveys to be performed to check if the vessel is able to return to class, within the stated by the Class Notation assigned to its class in the period immediately prior to its decommissioning. The scope of this survey will be considered in a special appraisal by RBNA taking into account:

- a. the status of the surveys before entering the condition out of service;
- b. the time span during which the vessel was out of service;
- c. the periodical surveys for maintenance of class during the period in which the vessel was out of service;

205. The details of the above surveys may be found in part II, Title 102 of the Rules.

## F8. CONTINUOUS MACHINERY SURVEY

### 100. Continuous Machinery Survey

101. Upon Owners' request, the Society may agree, at its sole discretion and subject to certain conditions, the examination of some items of the Continuous Machinery Survey to be carried out by the Chief Engineer when, due to operative reasons, the ship is in ports or areas where the Society is not represented or even when at sea.

102. The surveys thus carried out shall be in compliance with the requirements of Part I, Title 02, Section 2 and are subject to a subsequent limited confirmatory survey to be carried out at the next port of call of the ship where a local RBNA surveyor is available. The basic conditions for the continuous machinery surveys are presented below

103. The Owner shall submit to RBNA a written request for accreditation of the Chief Engineer in the program of continuous machinery survey, which must bring at least the following data:

- a. Name
- b. Age
- c. Professional Qualification
- d. Experience Summary
- e. Time in the company.

104. The accredited Chief Engineer is to be in full confidence of the Owner and have provided services to the Owner along an adequate time. The Owner must keep RBNA informed of any changes in the appointed list of names of the Chief Engineer due to output, alteration of qualification, etc.

105. Once approved the accrediting of the Chief Engineer RBNA will send to the Owner a Letter of Authorization, and the Owner is to make one or more copies to be kept always on the ship where the accredited Chief Engineer is onboard.

106. Upon the confirmation surveys (see F8.102 above) a copy of this letter shall be presented to the surveyor.

107. **Duties of the Chief Engineer:** The Chief Engineers shall duly record in the Engine Log Book all surveys carried out without the presence of the surveyor of RBNA. The items and / or equipment which have been replaced during the surveys carried out by the Chief Engineer must remain on board until they are inspected by a surveyor of RBNA. Additionally, the Chief Engineer shall prepare a detailed report of all items of the machinery that has been inspected using the encoding of RBNA, which shall contain clearly and explicitly the following:

- a. Name and qualification of the Chief Engineer.
- b. Number and date of his/her license as Chief Engineer.
- c. Port or leg of the trip in which the survey was performed.
- d. Date of survey.
- e. Number of the Letter of Authorization RBNA.
- f. Code of inspected items (as listed in the Status of Class).
- g. Description of the item, the circumstances that led to the inspection, condition in which the items were found and the following concluding sentence:
  - g.1. "found in order" or – "Fixed" or – "To be repaired"

108. **Duties of the surveyor:** Within a reasonably short period after the completion of the surveys of the Chief Engineer is to request the presence of a surveyor of RBNA on board, being followed the following procedure:

- a. The surveyor of RBNA shall receive from the Chief Engineer a copy of the Letter of Authorization issued by this Classification Society
- b. The surveyor of RBNA shall receive from the Chief Engineer two copies of the report of surveys that have been carried out.
- c. The surveyor shall check the relevant record in the Engine Log Book.
- d. The surveyor shall inspect the parts / damaged equipment retained on board by the Chief Engineer
- e. During the course of inspection, the surveyor may request an inspection of the item for confirmation. This check, as a rule, should be functional without the need of disassembling unless it is regarded as indispensable.
- f. In case of too long a delay in the request for the presence of a surveyor from RBNA, the scope of the survey may be extended at surveyor's discretion.

109. **Items included in the program of continuous machinery survey:** the following items are part of the continuous machinery survey program and can be inspected and credited by the Chief Engineer under the conditions stated in this sub chapter F8:

- a. MCE (Main Combustion Engine) Heads;
- b. MCE Valves and its drive devices;
- c. MCE jackets;

- d. MCE piston rods;
- e. Connector with its crossheads and bearings, bushings and guides;
- f. MCE injection and feed pumps;
- g. Pumps driven by MCE such as Engine Room sewage, lube oil and cooling;
- h. Pumps driven independently of MCE such as the Engine Room bilge, bilge hull, seawater cooling, lubricating oil and fuel oil transfer;
- i. MCE Coolers of water and oil except in the case that the vessel is only equipped with a cooler for the intended purpose;
- j. Low pressure Coolers used in heavy fuel systems of oil for internal combustion engines;
- k. Air compressors;
- l. Fans and drives;
- m. Auxiliary machinery steam or internal combustion engines, with their coolers and pumps, since its allocation is such that all essential services for the safety of vessel and cargo may be carried out with the machinery in overhauling out of service for inspection.

110. Procedures to be followed in continuous machinery surveys: the procedures to be followed for inspection of the machinery are contained in Part I of Title 02 Section 2 of the Rules for the equipment in question.

111. **Items NOT included in the machinery continuous survey:** the following items will not be allowed to be inspected without the presence of a surveyor of RBNA:

- a. Main and auxiliary boilers;
- b. Pressure Vessels
- c. Main and auxiliary turbines
- d. Gearboxes
- e. MCE crankshaft with their fixed and movable bearings
- f. MCE Turbochargers
- g. Line shafts and their bearings

**F9. PLANNED MAINTENANCE SCHEME (PMS)  
FOR MACHINERY  
[IACS UR Z20]**

**100. General**

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

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

103. This scheme is limited to components and systems covered by CMS (see subchapter F8 above).

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

**200. Maintenance Intervals**

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

202. However, if an approved condition monitoring system is in effect, the machinery survey intervals based on CMS cycle period may be extended.

**300. Onboard responsibility**

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

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

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

**400. Procedures and conditions for approval of a PMS**

401. The PMS shall be programmed and maintained by a computerized system. However, this may not be applied to the current already approved schemes.

402. The system shall be approved in accordance with a procedure of each individual Member Society.

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

404. The following documentation shall be submitted for the approval of the scheme:



- a. organization chart identifying areas of responsibility;
- b. documentation filling procedures;
- c. listing of equipment to be considered by classification in PMS;
- d. machinery identification procedure;
- e. preventive maintenance sheet(s) for each machine to be considered;
- f. listing and specifications of condition monitoring equipment;
- g. baseline data for equipment with condition monitoring,
- h. listing and schedule of preventive maintenance procedures.

405. In addition to the above documentation the following information shall be available on board:

- a. all clauses in F9.404 in an up-to-date fashion;
- b. maintenance instructions (manufacturer's and shipyard's);
- c. condition monitoring data including all data since last opening of the machine and the original base line data;
- d. reference documentation (trend investigation procedures etc.),
- e. records of maintenance including repairs and renewals carried out.

#### 500. Approval validity

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

502. An implementation Survey shall be carried out to confirm the validity of the certificate/class notation (see 600 below).

503. An annual report covering the year's service, including the following information, shall be reviewed by the Society:

- a. clauses F9.404.c, d, e, and g as well as changes to other clauses in F9.404
- b. clause F9.405.c,

504. An Annual Audit shall be carried out to maintain the validity of the PMS.

505. The survey arrangement for machinery under PMS can be cancelled by the Society if PMS is not being satisfactorily carried out either from the maintenance records or the general condition of the machinery, or when the agreed intervals between overhauls are exceeded.

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

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

#### 600. Implementation Survey

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

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

- a. the PMS is implemented according to the approval documentation and is adapted to the type and complexity of the components/system on board;
- b. the PMS is producing the documentation required for the Annual Audit and the requirements of surveys and testing for retention of class are complied with;

603. When this survey is carried out and the implementation is found in order, a report describing the system shall be submitted to the Society and the system may be put into service.

#### 700. Annual Audit \*

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

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

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

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

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

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

707. At the discretion of the surveyor, function tests, confirmatory surveys and random check readings, where condition monitoring equipment is in use, shall be carried out as far as practicable and reasonable.

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

### **800. Damage and repairs**

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

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

803. In the case of overdue outstanding recommendations or a record of unrepaired damage which would affect the PMS the relevant items shall be kept out of the PMS until the recommendation is fulfilled or the repair is carried out.

## **F10. ACCEPTANCE OF MANUFACTURER'S QUALITY CONTROL ASSURANCE SYSTEMS FOR WELDING CONSUMABLES**

### **100. Introduction**

101. The present guidelines are to serve as a supplement to Part III Title 02 Section 61 Chapter E to facilitate a uniform procedure for the acceptance of manufacturer's quality assurance systems as an alternative to the annual procedures given in the above document.

102. By acceptance of a quality assurance system the RBNA delegates to manufacturers the responsibility for proper performance of part of the prescribed checking and testing.

103. By acceptance of the quality assurance system the RBNA obliges the manufacturer to comply with the requirements laid down in the Rules and with the requirements as laid down in the approvals granted and/or in the present guidelines and to furnish proof thereof to the RBNA.

104. The RBNA will check the efficiency of the quality assurance system on the basis of documentation to be prepared by the manufacturer, within the scope of an initial and later periodical workshop inspection(s). The maintenance of the approval(s) granted is conditional on a positive result of such checks.

105. The present guidelines and acceptance of any manufacturer's quality assurance system granted in accordance therewith exclusively applies to maintenance or extension of approvals already granted for welding consumables and auxiliary materials. Initial approval tests are to be carried out in accordance with the Rules and in the RBNA's presence.

106. The acceptance of a manufacturer's quality assurance system applies only to the works or part of works, for which it has been granted. Any independent branches or licensees operating at some other place may on application be included in the approval, if fully covered by the quality assurance system approved.

107. Definitions\*

- a. Quality: Conformance with specified requirements.
- b. Quality Assurance (QA): Measures to attain the required quality.
- c. Quality assurance system (QA System): A fixed organisational and sequential procedure for the implementation of quality assurance.
- d. Quality (system) audit: Independent assessment of the effectiveness of a quality assurance system or its parts.
- e. These definitions are in substantial agreement with ISO 8402.

108. Acceptance Procedure

- a. Application for acceptance of a manufacturer's QA system is to be submitted to the RBNA in writing, attaching the documentation listed in item F4.615.300. The works producing and packing the final product will be regarded as manufacturers.
- b. The RBNA will carry out a quality audit, checking the QA system for compliance with the approved documentation.
- c. Manufacturers will have to furnish proof that throughout the manufacturing process the QA system functions efficiently and is capable of ensuring the quality required and of detecting deficiencies and initiating corrective actions.
- d. Manufacturers will have to furnish proof that records will be kept on all QA measures, enabling the RBNA to check the efficiency of the QA system at any time and to verify whether the product meets its quality requirements.
- e. Following successful checking of the works, the RBNA will issue a certificate of acceptance of the QA system. Manufacturers are obliged to automatically advise the RBNA of any essential modifications to either the manufacturing process or the QA system.

- f. Approval by another organisation will not be accepted as sufficient evidence that arrangements for manufacture and quality comply with these requirements.
109. Period of Validity
- a. The period of validity of an acceptance in accordance with the present regulations is 3 years, provided that during this period approved welding consumables and/or auxiliary materials are manufactured without any major interruptions, the quality of which is checked by regular quality controls and the efficiency of the QA system for which is controlled by regular quality audits.
- b. Prior to expiry of the period of validity, it is the manufacturer's responsibility to apply for renewal.
- c. The RBNA may withdraw the acceptance, if the conditions under which it was granted no longer apply or if any grave deficiencies are found in either the QA system or the product concerned.
- 200. Requirements**
201. Quality Policy Statement
- a. Manufacturers will have to make a statement, by which they undertake to concentrate all their efforts on implementing the QA system and to provide the personnel entrusted therewith with all relevant powers and facilities. This statement must be signed by the management and the head of the QA department.
202. Organisation and Personnel
- a. Within the plant the quality assurance function is to be entrusted to an internal department which is independent of the production departments. The person placed in charge of the department must be directly responsible to the company management and must be vested with the authority necessary to enable him to plan all the requisite QA functions and to implement them effectively.
- b. Personnel responsible for planning implementing QA functions must hold the necessary qualifications for the work. The professional qualifications of personnel are to be attested by certificates, documentary evidence of professional activity or similar documentation.
- c. Manufacturers shall prepare an organisation chart which clearly describes and defines the areas of responsibility and activity of each individual. Any change in the personnel occupying responsible positions or changes in areas of responsibility and activity are to be immediately drawn to the attention of the RBNA.
203. Quality Planning
- a. All quality assurance functions are to be described and set out by the manufacturers within a clearly defined schedule compatible with the manufacturing process. The schedule must ensure compliance with the requirements of the Rules and with those of any additional standards or specifications applicable throughout all stages of production.
- b. The schedule must provide for the early detection of existing (and potential) deficiencies, trends or circumstances which might result in quality defects, and must ensure speedy and effective corrective actions. The schedule shall include as a minimum requirement the quality controls specified in item 400.
- c. Manufacturers shall programme and carry out quality assurance functions, inspections and checks at a sufficiently early stage to ensure that any improvements needed can still be performed without difficulty and that the characteristics of any component which cannot be verified later are duly tested and placed on record according to schedule.
204. Measuring and Testing Equipment
- a. Manufacturers must provide the measuring and testing appliances and equipment needed for the proper and competent performance of the controls and tests called for by the quality assurance system. Manufacturers must also equip their plant with the measuring and control devices required to ensure the quality demanded.
- b. All measuring and testing appliances and other equipment which determines or influences quality are to be regularly and competently maintained according to a fixed schedule and are to be adjusted or calibrated where this is specified. These operations shall be performed by the works personnel or by persons appointed by the work for that purpose.
- c. The programme, the persons responsible and the relevant records form part of the schedule under item 203 and the associated documentation and shall be made available to the Surveyor of the RBNA on demand.
205. Corrective Actions
- a. Manufacturers are required to devise and regularly implement methods of detecting and correcting any factors in the production process and in quality assurance which are detrimental to quality. With this in view, the faults detected and the improvements needed as well as the quality audits called for in item F4.615.500 are to be subjected to constant analysis and evaluation. The causes of the faults are to be ascertained and effective measures applied to improve quality.

206. Documentation
- a. Manufacturers must keep suitable records of all QA functions, inspections and checks which substantiate the efficiency of the system and the required quality of the components. The records must give details of the nature and extent of the discrepancies and faults, of improvements and retests, where applicable, and must indicate any corrective actions needed.
  - b. The records (test reports, inspection reports, etc.) are to be made available to the RBNA on request at any time, or, where appropriate, a copy shall be passed to the RBNA for examination. The RBNA may, in addition, stipulate the regular submission of certain project-related records. All records shall be preserved by the works for at least three years, but in any case up to the next works inspection.
- 300. Documents**
301. QA Manual
- a. Manufacturers are required to compile a QA manual describing the QA system. The QA manual must have been approved, signed and authorised for use by the company management. The latest version must be available to all concerned.
  - b. The QA manual shall contain at least the following information:
    - b.1. Principles and scope of the system in accordance with items F4.615.100 and 200;
    - b.2. Description of the works production and testing facilities and methods;
    - b.3. Details of any computer facilities and the systems using those facilities for production and quality control;
    - b.4. Organisation of the works and the Quality Assurance Department in accordance with item 202;
    - b.5. Description of quality assurance functions and procedures in accordance with item F4.615.203 to 206 and item F4.615.400;
    - b.6. Details of systems and methods used to maintain a satisfactory standard of finished products which comply with the Rule requirements. This information is to be presented in the form of a flow chart indicating all stages where testing and inspection are carried out;
    - b.7. Work and inspection instructions in accordance with item F4.615.302 and 400;
302. Work and Inspection Instructions
- a. For the performance of quality assurance functions manufacturers shall compile and maintain written work and inspection instructions which are clear and complete and relate to the successive stages of manufacture and inspection.
  - b. The work instructions must specify the sequence and interrelationship of the various QA functions and must state who is responsible for carrying them out.
  - c. Besides details of the nature and scope of the inspections and the inspection methods and equipment (appliances) used, the inspection instructions must specify criteria governing the acceptance, repair and rejection of preliminary or in-process materials or final products.
  - d. Manufacturers shall ensure that the latest versions of work and inspection instructions are made available to all sections and individuals responsible for carrying out QA functions, and manufacturers shall verify that these are complied with.
303. Standards and Manufacturers' Specifications
- a. The performance and assessment of QA measures may also be based on generally accepted rules of technology, such as standards, and on manufacturers' specifications (data sheets). These documents shall be listed in the QA manual and/or instructions for testing or attached to these and incorporated into the acceptance procedure (cf. item 108).
- b.8. Procedures for the handling of non-conforming products, see item F4.615.406;
- b.9. Corrective procedures in accordance with item F4.615.205;
- b.10. Procedures for authorisation and recording of concessions;
- b.11. Instructions for the compilation and evaluation of the documentation described in item 206;
- b.12. Instructions for the performance and evaluation of quality audits in accordance with item 501.
- b.13. The QA manual is to be submitted for approval to the RBNA together with the application described in item F4.615.108 and provides the basis for the assessment and approval of the works QA system.

**400. Quality Controls**

401. Bought-in Materials

- a. By appropriate purchase specifications to suppliers, by inspections of incoming goods and by proper storage and marking manufacturers are to ensure that only conforming materials are used.
- b. The supply, identification, marking and follow-up of materials during manufacture must conform to fixed rules and be duly recorded. The appropriate materials certificates are to be appended to the relevant documentation.

402. Manufacturing Control

- a. During current manufacture, depending on the manufacturing method and product, manufacturers will have to carry out appropriate checks ensuring suitability of the process, adequate quality of the intermediate product and timely initiation of any corrective measures required.

403. Identification and Marking

- a. Manufacturers shall establish, apply and supervise a marking system enabling intermediate products to be identified at any stage of manufacture without any confusion.
- b. The system is to be checked, i.e. the materials being manufactured are to be identified in accordance with a fixed plan. Relevant documents shall be prepared on performance of these checks.

404. Final Inspection, Packing and Storage

- a. Manufacturers must ensure by regular checks of the final products that only unobjectionable and intact welding consumables and auxiliary materials are packed and delivered. Depending on the kind of product, these include checks of dimensions and/or weights, of appearance (i.e. checks for damages), as well as regular weldability checks.
- b. Records are to be prepared on the checks and results obtained thereby. A relevant note printed on the packing (batch no and the like) must provide traceability of the process of manufacture and tests and checks performed, which will have to include checks of transportation and storage at the manufacturers.

405. Test Weldings and Testing of the Mechanical Properties

- a. At least once per year, counting from the date of approval, the manufacturer shall make welded assemblies and mechanical tests, as stipulated in the RBNA's Rules, of all approved welding consumables.

- b. The welded assemblies and tests, including all - even unsatisfactory - results shall be reported. The protocols should be signed by the tester and the head of the QA department and handed to the RBNA's Surveyor before or on the occasion of the audits, as per item F4.615.502. Any corrective actions effected, too, shall be indicated in the protocols.

406. Rejected Materials and Products

- a. Manufacturers are required to establish a procedure for the detection and subsequent treatment of defective materials and products. This procedure must encompass the prompt detection and withdrawal of defective materials, decisions concerning subsequent action, how this action is to be performed and the necessary retesting to be applied.
- b. The procedure must preclude the unauthorised further use of defective and withdrawn materials. It is to be made clear where responsibility lies for the decision concerning the subsequent action to be taken.
- c. Records are to be kept covering the nature and extent of defects, the subsequent treatment and, where applicable, retests and any corrective measures which may be introduced. These records are to be compiled and evaluated in such a way as to enable conclusions to be drawn regarding the current quality level and hence the effectiveness of the QA system.

**500. Quality Audits**

501. Internal Quality Audits

- a. During the period of validity of approval of a works QA system systematic checks (quality audits) are to be carried out at regular intervals on the whole, or parts of, the system. The procedure followed is to be set down in writing and is to be approved by the RBNA. The audits are to be performed by personnel specially trained for the purpose who are not themselves employed in, or responsible for, the areas of activity concerned.
- b. Quality audits are to include verification that:
  - b.1. Manufacture and quality assurance are being carried out in accordance with valid documents and established procedures and no inadmissible modifications have been introduced;
  - b.2. Manufacture, inspection and monitoring equipment is in good working order compatible with the satisfactory performance of quality assurance functions;
  - b.3. Faults in manufacture are detected without fail and the necessary steps taken to overcome them and retest;



- b.4. The necessary care is being taken to identify and eliminate the causes of deficiencies;
- b.5. The documentation is complete and provides a reliable history of all QA functions and their effectiveness.
- c. Records are to be kept of all quality audits. These records are to contain full details of the checks carried out on the whole, or parts of, the QA system including the results obtained and any corrective measures introduced. On request, these records together with the pertinent documents are to be presented to the Surveyor, and shall be kept together and held in readiness for the (repeat) works inspection for extension of the RBNA's approval.
502. Quality audits will be made by the RBNA as follows:
- a. Upon expiry of the period of validity (see item F4.615.109) a comprehensive audit is to be made.
- b. Intermediate audits are to be made at intervals not exceeding 1 (one) year.
503. For this purpose the Surveyor of the RBNA shall at all times be given access to the manufacturing plant and to the manufacturing documents and records. The works shall also provide the Surveyor with reasonable human and material assistance e (e.g. services, premises and instruments) to enable him to perform his duties.

## CHAPTER G STATUTORY SURVEYS

### CHAPTER CONTENTS

#### G1. ACCREDITATION

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#### G1. ACCREDITATION [IACS PR 31]

##### 100. Definition

101. The term “Statutory Survey” includes surveys under the responsibility of the Maritime Authority. The purpose of the Statutory Surveys is to assess compliance with national or international regulations.

##### 200. Statutory Surveys carried out by the RBNA

201. The accreditation to carry out the statutory surveys is given by the Brazilian Maritime Authority.

202. The statutory surveys for which the RBNA is accredited will be informed on request

203. When delegated by the Administration concerned, RBNA will act on its behalf within the limits of such delegation. In this respect, RBNA will take into account the relevant national and international requirements, survey the ship, report and issue or contribute to the issue of the corresponding certificates.

204. The above surveys do not fall within the scope of the classification of ships, even though their scope may overlap. Items which are statutory but have been considered as Classification Items by IACS UR Z1 have been inserted in the present Rules as Class items.

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

#### 300. Mandatory applications of IACS Unified interpretations [IACS PR 31]

301. Considering the mandatory nature of adopted IACS Unified Interpretations, the RBNA requires compliance with the IACS Unified Interpretations applicable to a vessel, its machinery and equipment, in accordance with the implementation dates and provisions stated in the UI, when acting as a recognized organization, authorized by a flag State Administration to act on its behalf, unless the flag Administration provides its own interpretation. These measures, which are to be available to clients, include, but are not limited to:

- a. the inclusion of the Unified Interpretations in the Society's classification Rules, or
- b. an appropriate provision in the Society's contracts for statutory certification services.

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