Z17 Procedural Requirements for Service Suppliers

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Annex 1 Special Requirements for Various Categories of Service Suppliers

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Revision notes:

1. Rev.4 added in Annex, Section 10, 11 & 12, with reference in 3.1.2.
2. Rev.5 clarified applicability to thickness measurement companies in 3.1.1 and Annex 1, 1.1.
3. Rev.6 is to be uniformly implemented by IACS Societies and Associates from 1 January 2008.
4. Rev.7: Section 13 is added to Annex 1. This section applies to requests for recognition of test laboratories received on or after 1 January 2008.
5. Rev.8: Reference to IACS Recommendations 101 and 102 added.
6. Rev.9: Includes procedures for approval of test laboratories against res. MSC.288(87) and applies to requests for recognition of approval of testing laboratories received on or after 1 July 2013. However, deletion of the reference to PR 34 in Rev.9 applies from 1 July 2012.
7. Rev.10: Full document review carried out - Rev.10 is to be uniformly implemented by IACS Societies from 1 January 2016.
8. Rev.11: Full document review in order to verify the compliance with R.O. Code, IMO Res. MSC 349(92), carried out - Rev.11 is to be uniformly implemented by IACS Societies from 1 July 2016.
9. Rev.12: Section 15 of Annex 1 revised - Rev.12 is to be uniformly implemented by IACS Societies from 1 January 2018.
10. Rev.13: Section 3 of Annex 1 revised - Rev.13 is to be uniformly implemented by IACS Societies from 1 January 2019.
11. Rev.14: Section 13 of Annex 1 revised - Rev.14 is to be uniformly implemented by IACS Societies from 1 January 2020.
12. Rev.15: Section 5 revised, Section 17 of Annex 1 newly added - Rev.15 is to be uniformly implemented by IACS Societies from 1 July 2021.
13. Rev.16: Section 18 of Annex 1 newly added – Rev.16 is to be uniformly implemented by IACS Societies from 1 January 2022.

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1. General

1.1 To approve firms providing services, such as measurements, tests or maintenance of safety systems and equipment, the Society is to apply procedures in this unified requirement and relevant Annex 1.

2. Objective

2.1 The objective of this procedure is to set minimum requirements for approval and certification of service suppliers and is applicable to both initial and renewal audits.

3. Definitions

- Manufacturer: A company that manufactures equipment required to be periodically serviced and/or maintained.

- Service Supplier (A Service Supplier or category of Service Supplier may be referred to here after simply as ‘supplier’): A person or company, not employed by an IACS Member, who at the request of an equipment manufacturer, shipyard, vessel’s owner or other client acts in connection with inspection work and provides services for 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 classification or statutory certification and services.

- Agent: A Person or Company authorised to act for or to represent a Manufacturer or approved/recognized service supplier.

- Subsidiary: A Company partly or wholly owned by a Manufacturer or approved/recognized service supplier.

- Subcontractor: A Person or Company providing services to a Manufacturer or approved/recognized service supplier, with a formal contract defining the assumption of the obligations of the service supplier.

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4. Application

4.1 This procedure applies to the approval of the following categories of service suppliers:

4.1.1 Statutory services

- Firms engaged in servicing inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats, marine evacuation systems
- Firms engaged in inspections and testing of radio communication equipment
- Firms engaged in inspections and maintenance of self-contained breathing apparatus
- Firms engaged in annual performance testing of Voyage Data Recorders (VDR) and simplified Voyage Data Recorders (S-VDR)
- Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships
- Firms engaged in inspections of low location lighting systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems
- Firms engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear
- Firms engaged in inspection, performance testing and maintenance of Automatic Identification Systems (AIS)
- Firms engaged in Commissioning Testing of Ballast Water Management System (BWMS)

4.1.2 Classification and/or Statutory services:

- Firms engaged in thickness measurements on ships or mobile offshore units except

  (1) non-ESP ships less than 500 gross tonnage and

  (2) all fishing vessels.
- Firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).
- Firms engaged in inspections and maintenance of fire extinguishing equipment and systems
- Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment
- Firms engaged in measurements of noise level on board ships
- Firms engaged in examination of Ro-Ro ship's bow, stern, side and inner doors
- Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82), as amended, and IACS UI SC223 and/or MSC.288(87), as amended.
- Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service

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- Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.

- Firms engaged in Cable Transit Seal Systems inspection on ships and Mobile Offshore Units.

4.1.3 Where a Society accepts work of a third party (eg., service supplier) approved by itself, the Society shall verify the performance of such services. For statutory service, the flag State may increase the scope of verification to be applied to these services. The process shall be defined within the Society's quality management system. For the purpose of accountability to the flag State, the work performed by the third party (eg., service supplier) constitutes the work of the Society and shall be subject to the requirements incumbent upon the Society under the RO Code IMO MSC.349 (92) and MEPC.237(65).

4.2 Where the results of the following service suppliers are used by a Surveyor of a Society in making decisions affecting classification services then that service supplier must be approved and verified by that Society.

- Firms engaged in thickness measurements on ships or mobile offshore units except

  (1) non-ESP ships less than 500 gross tonnage and

  (2) all fishing vessels.

- Firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).

- Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment

- Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.

4.3 Where such services are used by Surveyors in making decisions affecting statutory certification and service, the firms are subject to approval and verification by the Society where the Society is so authorised by the relevant flag Administration (i.e. the flag of the ship on which the servicing is to be done or the service equipment is to be used). For such services the Society may accept approvals done by:

i. the flag Administration itself,

ii. duly authorized organizations acting on behalf of the flag Administration, or

iii. other organizations those are acceptable to the flag Administration (e.g. other governments, etc.).

4.4 Use of the approved service suppliers is not mandatory for the following services, *unless instructed otherwise by the flag Administration* with respect to statutory certification

- Firms engaged in inspections of low location lighting systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems

- Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships

- Firms engaged in measurements of noise level onboard ships

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- Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82) as amended and IACS UI SC223 and/or MSC.288(87) as amended
- Firms engaged in examination of Ro-Ro ships bow, stern, side and inner doors

4.5 Detailed requirements specific to the various categories of suppliers are given in Annex 1. National and/or international requirements may give additional requirements. References to such national and/or international requirements are given in Annex 1.

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5. Procedure for Approval and Certification

5.1 Submission of documents

5.1.1 The following documents are to be submitted to the Society for review. General requirements concerning suppliers are given in 5.2, and specific requirements as relevant, in Annex 1.

- Outline of company, e.g. organisation and management structure, including subsidiaries to be included in the approval/certification
- List of nominated agents, subsidiaries and subcontractors
- Experience of the company in the specific service area
- For categories of Service Suppliers that require certification from manufacturers, manufacturer's documentary evidence that the Service Supplier has been certified or licensed to service the particular makes and models of equipment for which approval is sought shall be provided
- List of operators/technicians/inspectors documenting training and experience within the relevant service area, and qualifications according to recognised national, international or industry standards, as relevant
- Description of equipment used for the particular service for which approval is sought
- A guide for operators of such equipment
- Training programmes for operators/technicians/inspectors
- Check lists and record formats for recording results of the services referred to in Annex 1
- Quality Manual and/or documented procedures covering requirements in 5.5
- Documented procedures for communication with the crew prior to commencing work, so that it is safe to decommission the equipment being maintained, and to provide a safe system of work in place
- Evidence of approval/acceptance by other bodies, if any
- Information on the other activities which may present a conflict of interest
- Record of customer claims and of corrective actions requested by certification bodies
- Operators/technicians/inspectors documentation they have acknowledged the code of conduct

5.2 General requirements:

5.2.1 Extent of Approval – The supplier shall demonstrate, as required by 5.2.2 – 5.2.11, that it has the competence and control needed to perform the services for which approval is sought.

5.2.2 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

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also have 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.

5.2.3 Supervision – The supplier shall provide supervision for all services provided. The responsible supervisor shall have had a minimum of two years of 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.

5.2.4 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.

5.2.5 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 and available. The record shall contain information on maintenance and results of calibration and verifications. The Society shall assess and record the validity of previous measuring results when the equipment is found not to conform to requirements. The Society shall take appropriate action on the equipment affected.

5.2.6 Control of data:
When computers are used for the acquisition, processing, recording, reporting, storage, measurement assessment and monitoring of data, the ability of computer software to satisfy the intended application shall be documented and confirmed by the service supplier. This shall be undertaken prior to initial use and reconfirmed as necessary.

Note: Commercial off-the-shelf software (e.g. wordprocessing, database and statistical programmes) in general use within their designed application range may be considered to be sufficiently validated and do not require any subsequent confirmation.

5.2.7 Where several servicing stations are owned by a given company, each station is to be assessed and approved except as specified in 5.5.3

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

5.2.9 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 such subcontracts. Subcontractors providing the services of the approved service supplier shall also meet the requirements of section 5.

5.2.10 Verification – The supplier shall verify that the services provided are carried out in accordance with approved procedures.

5.2.11 Reporting – The report shall be prepared in a form acceptable to the Society. The report should detail the results of inspections, measurements, tests, maintenance and/or repairs carried out. Special guidelines may be given in Annex 1. The report shall include a copy of the Certificate of Approval.

5.2.12 Documented procedures and instructions should be available for the recording of damages and defects found during inspection, servicing and repair work. This documentation is to be made available upon request.

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5.3 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 organised and managed in accordance with the submitted documents, and that it is considered capable of conducting the services for which approval/certification is sought.

5.4 Certification is conditional on a practical demonstration of the performance of the specific service as well as satisfactory reporting being carried out. At renewal audits, evidence of performance, verified by class surveyor, since the previous audit is sufficient to satisfy this requirement.

5.5 Quality System

5.5.1 The supplier shall have a documented system covering at least the following:

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

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

5.5.3 If a manufacturer of equipment (and/or its service supplier) applies to a Society for inclusion of its nominated agents and/or subsidiaries (excluding any subcontractor), in the approval, then it must have implemented a quality system certified in accordance with the most current version of ISO 9000 series. The quality system must contain effective controls of the manufacturer's (and/ or service supplier's) agents and/or subsidiaries. The nominated agents/subsidiaries must also have in place 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 audits on such agents or subsidiaries against the most current version of ISO 9000 series to confirm adherence to this quality system.

5.6 Service Suppliers Relations with the Equipment Manufacturer

5.6.1 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 proper training of the agent's technicians. Such suppliers shall be approved either on a case by case basis, or in accordance with 5.5.3.

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6. Certification

6.1 Upon satisfactory completion of both the audit of the supplier and the demonstration test, as applicable, the Society may 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 utilised by the Society's Surveyors in making decisions affecting classification or statutory certification, as relevant. The Certificate shall clearly state the type and scope of services and any limitations or restrictions imposed including type of equipment and/or names of Manufacturers of equipment where this is a limiting restraint. The supplier may also be included in the Society's record of approved service suppliers.

6.2 Renewal or endorsement of the Certificate is to be made at intervals not exceeding five (5) years by verification through audits that approved conditions are maintained or, where applicable, on expiry of the supplier's approval received from an equipment Manufacturer, whichever comes first. In the latter case, the Society is to be informed in due course by the Service Supplier. Individual Societies may require renewal or endorsement of the Certificate at intervals shorter than five (5) 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.

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7. Information Regarding Alterations to the Certified Service Operating System

7.1 When any alteration to the certified service operating 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.

8. Cancellation of Approval

8.1 The Society reserves the right to cancel the approval and to inform the IACS Members accordingly (For Firms engaged in thickness measurements refer to PR23).

8.2 Approval may be cancelled in the following cases:

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

8.2.2 Where a Surveyor finds deficiencies in the approval service operating system of the supplier and appropriate corrective action is not taken.

8.2.3 Where alterations have been made to the Company's Quality System relevant to the service supplier certificates, without written notification to the Society.

8.2.4 Where the intermediate audit, if requested as per 6.2, has not been carried out.

8.2.5 Where wilful acts or omissions are ascertained.

8.2.6 Where any deliberate misrepresentation has been made by the Service Supplier.

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

8.4 Expiration or cancellation of the Supplier's parent company approval automatically invalidates approval of all agents and subsidiaries if these are certified according to 5.5.3.

9. Existing Approvals

Approvals for the categories of service suppliers granted before the date of implementation of UR Z17 by a society may remain valid as stated in the respective certificates for a period up to but not exceeding 3 years. Renewals of such certificates must be carried out in accordance with UR Z17.

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ANNEX 1

Special Requirements for Various Categories of Service Suppliers

1. Firms engaged in thickness measurements on ships or mobile offshore units

1.1 Extent of engagement – Thickness measurement of structural material of ships or mobile offshore units except

(1) non-ESP ships less than 500 gross tonnage and

(2) all fishing vessels.

1.2 Supervisor – The responsible supervisor shall be qualified according to a recognised national or international industrial NDT standard (e.g. EN 473 level II as amended or ISO 9712 level II as amended).

1.3 Operators – The operators carrying out the measurements shall be certified to a recognised national or international industrial standard (e.g. EN 473 level I as amended or ISO 9712 level I as amended) and shall have adequate knowledge of ship structures sufficient to elect a representative position for each measurement.

1.4 Equipment – On coated surfaces, instruments using pulsed echo technique (either with oscilloscope or digital instruments using multiple echoes, single crystal technique) are required. Single echo instruments may be used on uncoated surfaces, which have been cleaned and ground.

1.5 Procedures – Documented work procedures are at least to contain information on inspection preparation, selection and identification of test locations, surface preparation, protective coating preservation, calibration checks, and report preparation and content.

1.6 Reporting – The report shall be based on the guidelines given in UR Z7, UR Z7.1, UR Z7.2, Z10.1, Z10.2, Z10.3, Z10.4 and Z10.5, as relevant.

1.7 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by the attending Surveyor(s) signature.

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2. Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment

2.1 Extent of engagement – Ultrasonic tightness testing of closing appliances such as hatches, doors etc.

2.2 Operators – The operator is to have the following qualifications:

- Have knowledge of different closing appliances such as hatches, doors etc. including their design, functioning and sealing features
- Have experience with the operation and maintenance of different closing appliances such as hatches, doors etc.
- Be able to document theoretical and practical training onboard in using the ultrasonic equipment specified

2.3 It shall be demonstrated to the Surveyor that the ultrasonic equipment is fit for the purpose of detecting leakages in closing appliances.

2.4 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.

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3. Firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).

3.1 Extent of engagement – In-water survey in lieu of a docking survey and/or the internal hull survey of compartments filled with water on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).

3.2 Training of personnel – The supplier is responsible for the qualification of its divers, Remotely Operated Vehicle (ROV) operators and supervisors and for their training in the use of the equipment utilised when carrying out inspection. Knowledge of the following shall be documented:

- Ship's underwater structure and appendages, propeller shaft, propeller, rudder and its bearings, etc.
- Non-destructive testing in accordance with a recognised national or international industrial NDT standard. This requirement only applies if an in-water survey company performs non-destructive testing
- Certification as a thickness measurement firm when conducting thickness measurements under water
- Bearing clearance measurements on rudders and propeller shaft
- Under-water video monitoring with TV-monitors on deck, as well as still picture work
- Operation of under-water communication system
- Any special equipment necessary for the work carried out.

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

3.4 Supervisor

3.4.1 Diving Supervisor – Diving supervisor shall be qualified according to the supplier's general requirements and shall have a minimum of two years' experience as a diver carrying out inspection.

3.4.2 ROV Supervisor – ROV supervisor shall have a minimum of two (2) years of experience conducting inspections with ROVs.

3.5 Diver and Operators

3.5.1 Divers carrying out inspection – The diver carrying out the inspection shall have had at least one year's experience as an assistant diver carrying out inspections (including participation in a minimum of 10 different assignments).

3.5.2 ROV operators- ROV operators shall have at least one year of experience working with ROVs conducting inspections on vessels.

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3.6 Equipment

3.6.1 The following shall be available:

- Closed circuit colour television with sufficient illumination equipment
- Two-way communication between diver and surface staff
- Video recording device connected to the closed circuit television
- Still photography camera
- Equipment for carrying out thickness gauging, non-destructive testing and measurements, e.g. clearances, indents, etc., as relevant to the work to be performed
- Equipment for cleaning of the hull

3.6.2 In addition to above 3.6.1, the following shall be available for firms carrying out survey by ROV:

- Remotely Operated Vehicle (ROV)
- Adequate controls or programming for the ROV functions required

3.7 Procedures and guidelines

3.7.1 The supplier shall have documented operational procedures and guidelines for how to carry out the inspection and how to handle the equipment. These shall include:

- Two-way communication between diver and surface
- Video recording and closed circuit television operation
- Guidance of the diver along the hull to provide complete coverage of the parts to be inspected

3.7.2 In addition to above 3.7.1, documented operational procedures and guidelines for firms carrying out in-water survey by ROV shall also include:

- Guidance for the operation and maintenance of the Remotely Operated Vehicle, if applicable
- Methods and equipment to ensure the ROV operator can determine the ROV's location and orientation in relation to the vessel.

3.8 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by the attending Surveyor(s) signature.

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4. Firms engaged in inspection and maintenance of fire extinguishing equipment and systems

4.1 Extent of engagement – inspections and maintenance of fire-extinguishing equipment and systems such as fixed fire extinguishing systems, portable fire extinguishers and fire detection and alarm systems.

4.2 Extent of Approval

- Service Suppliers are to have professional knowledge of fire theory, fire-fighting and fire-extinguishing appliances sufficient to carry out the maintenance and/or inspections, and to make the necessary evaluations of the condition of the equipment

- In demonstrating professional knowledge, Service Suppliers are to have an understanding of the various types of fires and the extinguishing media to be used on them

- For fixed fire-extinguishing systems, Service Suppliers are to demonstrate an understanding of the principles involved with gas, foam, deluge, sprinkler and water-mist systems, as relevant for the approval being sought

4.3 Procedures

- Service Suppliers are to have documented procedures and instructions on how to carry out the servicing of the equipment and/or system. These are to either contain or make reference to the Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate, and to international requirements

- Additionally they are to make reference to any requirements (e.g. what markings should be appended to the equipment/system)

4.4 Reference Documents - The Service Supplier is to have access to the following documents:

- Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate

- Type Approval certificates showing any conditions that may be appropriate during the servicing and/or maintenance of fire-extinguishing equipment and systems

- SOLAS, MSC.1/Circular.1318 (Guidelines for the Maintenance and Inspections of Fixed Carbon Dioxide Fire-Extinguishing Systems), International Code for Fire Safety Systems (FSS Code), ISO 6406 (Periodic inspection and testing of seamless steel gas cylinders), and any documentation specified in the authorisation or license from the equipment manufacturer

- MSC/Circ.670 (Guidelines for the Performance and Testing Criteria and Surveys of High Expansion Foam Concentrates for fixed Fire-Extinguishing Systems)

- MSC/Circ.798 (Guidelines for the Performance and Testing Criteria and Surveys of Medium Expansion Foam Concentrates for fixed Fire-Extinguishing Systems)

- MSC/Circ.799 ((Guidelines for the Performance and Testing Criteria and Surveys of Expansion Foam Concentrates for fixed Fire-Extinguishing Systems of Chemical Tankers)

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- MSC.1/Circ.1312 (Revised Guidelines for the Performance and Testing Criteria and Surveys of Foam Concentrates for fixed Fire-Extinguishing Systems as corrected by MSC/Circ.1312/Corr.1)
- MSC.1/Circ.1432 (Revised Guidelines for the maintenance and Inspection of Fire Protection Systems and Appliances)
- IMO Res. A. 951(23) – Improved guidelines for marine portable fire extinguishers
- MSC.1/Circ.1370 – Guidelines for the design, construction and testing of fixed hydrocarbon gas detection systems
- Guidelines adopted by IMO for fire extinguishing equipment and systems specifically intended for service by service suppliers

4.5 Equipment and Facilities

4.5.1 General Requirements

- If Service Suppliers undertake shore-based inspecting and maintenance, they should maintain and implement procedures for workshop cleanliness, ventilation and arrangement, with due cognisance of the spares and extinguishing media being stored, to ensure safe and effective working procedures
- Service Suppliers undertaking inspecting and maintenance of equipment and systems onboard are to provide the appropriate facilities to either complete the work onboard or remove the necessary items to their workshops

4.5.2 Equipment

Sufficient and appropriate spares and tools are to be available as applicable, which should include:

- Various scales to weigh items
- Means to hydrostatically pressure test components/systems/storage bottles
- Liquid/gas, flow meters, as appropriate
- Pressure gauges or manometers
- In the cases of foam concentrates and portable fire-extinguishers, chemical analysis equipment and a testing bay, respectively; and
- Specific equipment/spares as may be specified by Manufacturer
- Level measuring equipment for bottles
- Recharging facilities for pressurized bottles, extinguishers and cartridges

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5. Firms engaged in servicing inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats, marine evacuation systems

5.1 Extent of engagement

- Servicing of inflatable liferafts, inflatable lifejackets, hydrostatic release units and/or inflatable rescue boats
- Servicing of marine evacuation systems

5.2 Equipment and facilities – IMO Res. A.761(18) as amended by MSC.55(66) gives recommendations on conditions for the approval of servicing stations for inflatable liferafts which shall be observed as relevant. Where inflatable liferafts are subject to extended service intervals, MSC.1/Circ.1328 should also be followed.

5.3 Procedures and instructions – The supplier shall have documented procedures and instructions for how to carry out service of equipment. Where inflatable liferafts are subject to extended service intervals in accordance with the requirements of SOLAS Regulation III/20.8.3, MSC.1/Circ.1328 should be followed in addition to Resolution A.761(18) as amended by MSC.55(66).

5.4 The supplier shall provide evidence that it has been authorised or licensed to service the particular makes and models of equipment for which approval is sought by the equipment's manufacturer.

5.5 Reference Documents - The Service Supplier is to have access to the following documents:

- IMO - Resolution A.761(18) - Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts - (adopted on 4 November 1993), amended by Resolution MSC.55(66)
- IMO - Resolution MSC.55(66)
- IMO – MSC.1/Circ.1328 – Guidelines for the Approval of Inflatable Liferafts Subject to Extended Service Intervals Not Exceeding 30 Months
- Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate
- Type Approval certificates, showing any conditions that may be appropriate during the servicing and/or maintenance of inflatable liferafts, inflatable rescue boats, inflatable lifejackets, and hydrostatic release units
- LSA code/Chap.IV, 1995 SOLAS Conference Resolution 4 regarding marine evacuation systems

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6. Firms engaged in inspections and testing of radio communication equipment

6.1 Extent of engagement

- Surveys, inspection, testing, and/or measurement of radio equipment aboard ships or mobile offshore units for compliance with SOLAS regulations
- Annual testing of 406 MHz satellite EPIRBs for compliance with SOLAS Regulation IV/15.9
- The principles of this section also apply to Service Suppliers involved in inspection, performance testing and maintenance of Automatic Identification Systems (AIS).The Service Supplier is to be familiar with the equipment with which it will be involved, such as being a service agent for the equipment manufacturer

6.2 Reference documents – The supplier shall have access to the following documents:

- SOLAS 1974 as amended
- IMO Res.MSC.349(92): Code for Recognized Organizations (RO Code).
- MSC.1/Circ.1040/Rev.1 – Guidelines on Annual Testing of 406 MHZ Satellite EPIRBs
- MSC.1/Circ.1252 – Guidelines on Annual Testing of the Automatic Identification System (AIS)
- SN/Circ.227, SN/Circ.227/Corr.1 and 245 – Guidelines for the Installation of a Shipborne Automatic Identification System (AIS) and amendments thereto
- ITU Radio Regulations
- IMO Performance Standards for the equipment for which the Service Supplier is approved
- Flag State Administration requirements
- Relevant parts, if any, of the Society's Rules and Guidelines

6.3 Supervisor – The supervisor shall have a minimum two years education from a technical school, experience as inspector, and should preferably hold a General Operator's Certificate (GOC) or a GMDSS Radioelectronic Certificate (REC), recognised by the ITU, to operate or test radio transmitters. He should be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure.

6.4 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 training or as alternative hold evidence that he followed a technical course approved by the relevant Administration, at least one year's experience as an assistant radio inspector and should preferably hold an appropriate National Radio Operators Certificate, recognised by the ITU, such as a GMDSS General Operator's Certificate (GOC) or a GMDSS Radioelectronic Certificate (REC). He should be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure.

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6.5 Equipment and facilities

6.5.1 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.

6.5.2 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.

6.5.3 For equipment employing software in conjunction with the testing/examination, this software shall be fully described and verified.

6.6 Minimum required instruments:

- Equipment for measuring frequency, voltage, current and resistance
- Equipment for measuring output and reflect effect on VHF and MF/HF
- Equipment for measuring modulation on MF/HF and VHF (AM, FM, PM)
- Acid tester for checking specific gravity of lead batteries
- Tester for checking of correct output from Free-Float Satellite EPIRB
- Equipment for testing the performance of Automatic Identification Systems (AIS)

6.7 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 each item of the testing/inspection equipment shall also be kept and be available at all times.

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7. Firms engaged in inspections and maintenance of self contained breathing apparatus

7.1 Extent of Engagement - inspections and maintenance of self-contained breathing apparatus, Emergency Escape Breathing Devices (EEBD)

7.2 Extent of Approval

- 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 identify standards and to make the necessary evaluation of the condition of the equipment

- In demonstrating professional knowledge, Service Suppliers are to have an understanding of the operational requirements involved with self-contained breathing apparatus and how these are to be maintained

- Additionally, Service Suppliers are to demonstrate the necessary safety requirements applicable to such equipment

7.3 Procedures

- Service Suppliers are to have documented procedures and instructions on how to carry out the servicing of the equipment and/or system. These are to either contain or make reference to the Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate

- Additionally they are to make reference to any requirements (e.g. what markings should be appended to the equipment/system) and how they should be applied

7.4 Reference Documents - The Service Supplier is to have access to the following documents:

- Manufacturers' servicing manuals, servicing bulletins, instructions and training manuals, as appropriate

- Type Approval certificates showing any conditions which may be appropriate during the servicing and/or maintenance of self-contained breathing apparatus

7.5 Equipment and Facilities

7.5.1 General Requirements

- If Service Suppliers undertake shore-based inspecting and maintenance, they should maintain and implement procedures for workshop cleanliness, ventilation and arrangement, with due cognisance of the spares and pressurised bottles being stored, to ensure safe and effective working procedures

- Service Suppliers undertaking inspecting and maintenance of equipment and systems onboard are to provide the appropriate facilities to either complete the work onboard or remove the necessary items to their workshops

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7.5.2 Equipment

- Sufficient and appropriate spares and tools are to be available for repair, maintenance and servicing of self-contained breathing apparatus in accordance with the requirements of the Manufacturers

- These are to include, as required by the self-contained breathing apparatus equipment and/or systems:

  - Various scales to weigh items

  - Means to hydrostatically pressure test components/systems/storage bottles

  - Flow meters; and

  - Pressure gauges or manometers

  - Equipment for checking air quality

  - Recharging facilities for breathing apparatus

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8. Firms engaged in examination of Ro-Ro ships bow, stern, side and inner doors

8.1 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.

8.2 The supplier is to be certified to the most current version of ISO 9000 series.

8.3 Supervision - In addition to 5.2.3, the requirement to have had a minimum of two years experience as operator/technician/inspector within the activity, a Supervisor is to have a minimum two years related education from a technical school.

8.4 Training of personnel - Operators carrying out Non-Destructive Test (NDT) are to be qualified to a recognised National or International Standard for the methods used.

8.5 Reference documents - The supplier shall have access to the following reference documents:

- IMO - International Convention on the Safety of Life at Sea (SOLAS) 74/78, as amended
- ISO 9002:1994 - Quality systems - Model for quality assurance in production, installation and servicing
- UR Z24 - Survey Requirements for Shell and Inner Doors of Ro-Ro ships, or its equivalent, by the relevant class society

8.6 Required Equipment

8.6.1 For Inspection of Supporting Securing and Locking Devices, Hinges and Bearings:

- Equipment for measuring clearances (i.e. feeler gauges, vernier calipers, micrometers).
- Non-destructive test (i.e. dye penetrant, magnetic particle inspection)

8.6.2 For Tightness Testing:

- Ultrasonic leak detector or equivalent

8.6.3 For Inspection of Hydraulic Operating System:

- Pressure gauges
- Particle counter for analysing the quality of hydraulic fluid

8.6.4 For Inspection of Electric Control System and Indication System:

- Digital multi-meter
- Earth fault detector

8.7 Procedures and Instructions

8.7.1 The supplier shall have access to drawings and documents, including the Operating and Inspection Manual.

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8.7.2 The supplier shall have access to the service history of the doors.

8.7.3 The supplier should use, complete and sign a checklist which has been found acceptable by the classification society.

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9. Firms engaged in annual performance testing of Voyage Data Recorders (VDR) and simplified Voyage Data Recorders (S-VDR)

9.1 Extent of engagement – Testing and servicing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) in accordance with SOLAS Chapter V Regulation 18.8 and IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR), as applicable.

9.2 Extent of Approval

9.2.1 The supplier shall provide evidence that he has been authorised or licensed by the equipment's manufacturer to service the particular makes and models of equipment for which approval is sought.

9.2.2 Where the Service Supplier is also the Manufacturer of the Voyage Data Recorder (VDR) or Simplified Voyage Data Recorder (S-VDR) and has elected to apply IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) in its entirety for the purpose of acting as a Service Supplier engaged in annual performance testing, the following is to apply:

- The Manufacturer is responsible for appointing Manufacturer's Authorised Service Stations to carry out annual performance testing
- The Manufacturer is required to be an Approved Service Supplier and is to satisfy the requirements for Service Suppliers engaged in annual performance testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR), as applicable
- The Manufacturer's Authorised Service Station is not required to be an Approved Service Supplier
- The Manufacturer is to demonstrate that IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) is applied in its entirety

9.3 Procedures

9.3.1 The Service Supplier shall have documented procedures and instructions.

9.3.2 Where the Service Supplier is also the Manufacturer of the Voyage Data Recorder (VDR) or Simplified Voyage Data Recorder (S-VDR) and has selected to apply IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) in its entirety for the purpose of acting as a Service Supplier engaged in annual performance testing, the following is to apply:

- The Manufacturer is to have documented procedures for the assessment and authorisation of Manufacturer's Authorised Service Stations who carry out annual performance testing
- The Manufacturer is to have documented procedures for the review of Manufacturer's Authorised Service Stations annual performance test reports, analysis of the Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR) 12 hour log and the issue of annual performance test certificates to the Owner/Operator

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- The Manufacturer is to maintain a list of Manufacturer's Authorised Service Stations that can be accessed (by any available means, e.g. via a nominated contact point or from the Manufacturer's website) upon request

9.4 Reference Documents

9.4.1 The Service Supplier is to have access to the following documents:

- IMO - International Convention on the Safety of Life at Sea (SOLAS), 74/78, Ch V, Reg 18.8. – Approval, surveys and performance standards of navigational systems and equipment and voyage data recorder

- IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) - (11 December 2006)

- IMO - Resolution A.861(20) (adopted on 27 November 1997) as amended by IMO Resolution MSC.214(81) and revised by IMO Resolution MSC.333(90) - Performance Standards for Shipborne Voyage Data Recorders (VDRs)

- IMO - Resolution MSC.163(78) - Performance Standards for Shipborne Simplified Voyage Data Recorders (S-VDRs) - (adopted on 17 May 2004), as amended by IMO Resolution 214(81)

9.4.2 The Service Supplier is to have access to applicable industry performance standards, e.g.:

- IEC 61996 - Maritime navigation and radiocommunication equipment and systems - Shipborne voyage data recorder (VDR)

- IEC 61996–2 - Maritime navigation and radio communication equipment and systems – Shipborne voyage data recorder (VDR) – Part 2: Simplified voyage data recorded (S-VDR) – Performance requirements, method of testing and required test results

9.4.3 The Service Supplier is also to have access to any documentation specified in the authorisation or license from the equipment manufacturer.

9.5 Equipment and Facilities - In addition, the Service Supplier shall have equipment as specified in the authorisation or license from the equipment Manufacturer.

9.6 Reporting - Test Report

9.6.1 The Service Supplier shall issue a certificate of compliance as specified in the International Convention on Safety of Life at Sea (SOLAS 1974), as amended, Ch V, Reg 18.8.

9.6.2 Annual Performance Test of VDR and S-VDR should be recorded in the form of the model test report given in the Appendix to MSC.1/Circular.1222/Rev.1, signed and stamped by the Service Supplier and attached to the annual performance test certificate.

9.6.3 Where the Service Supplier is also the Manufacturer of the Voyage Data Recorder (VDR) or Simplified Voyage Data Recorder (S-VDR) and has selected to apply IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) in its entirety for the purpose of acting as a Service Supplier engaged in annual performance testing, the Manufacturer is to make arrangements for the following:

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- Review of the Manufacturer's Authorised Service Station annual performance test report
- Analysis of the recorder's 12 hour log
- Checking of the master record/database for the recorder

9.6.4 Issue of the annual performance test certificate to the Owner/Operator within 45 days of completion of the annual performance test.

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10. Firms engaged in inspections of low location lighting systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems

10.1 Extent of engagement – Luminance measurements on board ships of low location lighting systems using photo luminescent materials.

10.2 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) - Guidelines for the Evaluation, Testing and Application of Low-Location Lighting on Passenger Ships, ISO 15370-2010, FSSS Code Chapter 11)

- Be able to document theoretical and practical training onboard in using equipment specified

10.3 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^2 to 10 cd/m^2.

10.4 Procedures – Documented work procedures are at least to contain information on inspection preparation, selection and identification of test locations.

10.5 Reporting – The report shall conform to Annex C of ISO 15370-2010.

10.6 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by the attending Surveyor's signature.

10.7 Reference Documents

The Service Supplier is to have access to the following documents:

- IMO - International Convention on the Safety of Life at Sea (SOLAS), 74/78 Ch II-2, Pt D, Reg 13.3.2.5 – Marking of escape routes

- IMO – Fire Safety Systems (FSS Code), Ch 11 – Low-location lighting systems

- IMO - Resolution A.752(18) - Guidelines for the Evaluation, Testing and Application of Low-Location Lighting on Passenger Ships - (adopted on 4 November 1993)

- ISO 15370:2010 - Ships and marine technology - Low-location lighting on passenger ships – Arrangement

- MSC/Circ.1168 – Interim guidelines for the testing, approval and maintenance of evacuation guidance systems used as an alternative to low-location lighting systems

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11. Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships

11.1 Extent of engagement – Sound pressure level measurements of public address and general alarm systems on board ships.

11.2 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)
- Be able to document theoretical and practical training onboard in using equipment specified

11.3 Equipment – The measuring instrument shall be an integrating sound level meter with frequency analyser capabilities complying with IEC (International Electrotechnical Commission) 60651 and IEC 61672, type 1 precision class with, at least an A-weighting 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.

11.4 Procedures – Documented work procedures are at least to contain information on inspection preparation, calibration, selection and identification of test locations.

11.5 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.

11.6 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by his signature.

11.7 Reference documents

The Service Supplier is to have access to the following documents:

- SOLAS 74/78, Ch III, Pt A, Reg 4 – Evaluation, testing and approval of life-saving appliances and arrangements
- SOLAS 74/78, Ch III, Pt B, Reg 6 – Communications
- International Life-Saving Appliance (LSA) Code, Ch VII, Reg 7.2 – General alarm and public address system
- IMO - Code on Alarms and Indicators, 1995 as amended
- IEC 60651 (2001-10) - Sound level meters
- IEC 61672 - Electroacoustics - Sound level meters
- IEC 61260 - Electroacoustics - Octave-band and fractional-octave-band filters

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12. Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82) as amended and IACS UI SC223 and/or MSC.288(87) as amended

12.1 Laboratories

12.1.1 Extent of Engagement - Testing of coatings systems according to IMO Resolution MSC.215(82), as corrected by IMO MSC.1/Circ.1381 and amended by IMO Resolution 341(91) and IACS UI SC223 and/or MSC.288(87), as corrected by IMO MSC.1/Circ.1381 and amended by IMO Resolution 341(91).

12.1.2 The laboratory is to provide to the Society the following information:

- A detailed list of the Laboratory test equipment for the coating approval according to the IMO Resolution MSC.215(82) as amended and/or MSC.288(87) as amended.
- A detailed list of reference documents comprising a minimum those referred to in IMO Resolution MSC.215(82) as amended and/or MSC.288(87) as amended for the coating approval.
- Details of test panel preparation, procedure of test panel identification, coating application, test procedures and a sample test report.
- Details of exposure method and site for weathering primed test panels.
- A sample daily or weekly log/form for recording test conditions and observations including unforeseen interruption of the exposure cycle with corrective actions.
- Details of any sub-contracting agreements (if applicable).
- Comparison test report with an approved coating system or laboratory if available.

12.1.3 Reporting – Reference is made to the following IACS Recommendations:

- Rec. 101: IACS Model Report for IMO Resolution MSC.215(82) Annex 1 “Test Procedures for Coating Qualification”
- Rec. 102: IACS Model Report for IMO Resolution MSC.215(82) Annex 1 “Test Procedures for Coating Qualification”, Section 1.7 – Crossover Test

12.1.4 Audit of the test laboratory is to be based on this procedure and the standards listed in the IMO Resolution MSC.215(82) as amended and/or MSC.288(87) as amended for the coating approval.

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13. Firms engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear

13.1 Extent of engagement – Maintenance, thorough examination, operational testing, overhaul and repair of:

.1 lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats; and

.2 launching appliances and on-load and off-load release gear for lifeboats (including primary and secondary means of launching appliances for free-fall lifeboats), rescue boats, fast rescue boats and davit-launched liferafts.

13.2 Extent of Approval

13.2.1 The contents of this procedure apply equally to manufacturers or ship's operator when they are acting as Service Suppliers.

13.2.2 Any Service Supplier engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear carried out in accordance with SOLAS regulation III/20 shall be approved for these operations for each make and type of equipment for which they provide the service in accordance with IMO Resolution MSC.402(96)/Corr.1 (annex, section 7).

Such approval shall include, as a minimum:

- employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or an equipment manufacturer's established certification program. In either case, the certification program shall be based on the paragraph 13.3 for each make and type of equipment for which service is to be provided; and,
- compliance with provisions of paragraphs 13.4, 13.5 and 13.6

13.2.3 In cases where an equipment manufacturer is no longer in business or no longer provides technical support, Service Suppliers may be approved for the equipment on the basis of prior approval for the equipment and/or long term experience and demonstrated expertise as an approved service supplier.

13.3 Certification of Personnel

13.3.1 Personnel for the work specified in 13.1 shall be certified by the manufacturer or the Service Supplier for each make and type of the equipment to be worked on. Approved Service Supplier is allowed to certify its own personnel (i.e. employed by the same service supplier) only.

13.3.2 The education for initial certification of personnel should be documented and address, as a minimum:

- Causes of lifeboat and rescue boat accidents
- Relevant rules and regulations, including International Conventions
- Design and construction of lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats, including on load release gear and launching appliances

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- Education and practical training in the procedures specified in section 6 of the Annex to IMO Resolution MSC.402(96) /Corr.1 for which certification is sought
- Detailed procedures for thorough examination, operational testing, repair and overhaul of lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats, launching appliances and on load release gear, as applicable;
- Procedures for issuing a report of service and statement of fitness for purpose based on IMO Resolution MSC.402(96) /Corr.1 (annex, paragraph 5.3); and
- Work, health and safety issues while conducting activities on board.

13.3.3 The training for the personnel shall include practical technical training on thorough examination, operational testing, maintenance, repair and overhaul techniques using the equipment for which the personnel are to be certified. The technical training shall include disassembly, reassembly, correct operation and adjustment of the equipment. Classroom training shall be supplemented by field experience in the operations for which certification is sought, under the supervision of a certified person.

13.3.4 Prior to issuance of personnel certification, a competency assessment shall be satisfactorily completed, using the equipment for which the personnel are to be certified.

13.3.5 Upon completion of training and competency assessment, a certificate shall be issued defining the level of qualification and the scope of the certification (i.e. makes and types of equipment and specifically state which activities (annual thorough examination and operational tests; 5-year thorough examination, overhaul; overload operational tests; repairs) are covered by the certification). The expiry date shall clearly be written on the certificate and shall be three years from the date of issue. The validity of any certificate shall be suspended in the event of any shortfall in performance and only revalidated after a further competency assessment.

13.3.6 A competency assessment shall be conducted to renew the certification. In cases where refresher training is found necessary a further assessment shall be carried out after completion.

13.4 Reference Documents - The Service Supplier is to have access to the following documents:

- IMO - Resolution MSC.402(96) /Corr.1, Requirements for Maintenance, Thorough Examination, Operational Testing, Overhaul and Repair of Lifeboats and Rescue Boats, Launching Appliances and Release Gear
- IMO - Resolution A.689(17), recommendation on testing of life-saving appliances and, for life-saving appliances installed on board on or after 1 July 1999,
- IMO - Resolution MSC.81(70), as amended, revised recommendation on testing of life- saving appliances
- Manufacturer’s instructions (including updates, amendments and safety notices) for repair work involving disassembly or adjustment of on-load release mechanisms and davit winches.
- Type Approval certificate showing any conditions that may be appropriate during the servicing and/or maintenance of lifeboats, launching appliances and on-load release gear

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13.5 Equipment and Facilities - The Service Supplier is to have the following:

- Sufficient tools, and in particular any specialized tools specified in the equipment manufacturer's instructions, including portable tools as needed for work to be carried out on board ship
- Access to appropriate parts and accessories as specified by the equipment manufacturer for maintenance and repair
- For servicing and repair work involving disassembly or adjustment of on-load release mechanisms, availability of genuine replacement parts as specified or supplied by the equipment manufacturer

13.6 Reporting - The report shall conform to the requirements of IMO Resolution MSC.402(96) /Corr.1 (annex, paragraph 5.3). When repairs, thorough examinations and annual servicing are completed, a statement confirming that the lifeboat arrangements remain fit for purpose should be promptly issued by the Service Supplier that conducted the work. A copy of valid documents of certification and authorization as appropriate shall be included with the statement.

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14. Firms engaged in measurements of Noise level Onboard Ships

14.1 Extent of engagement

Sound pressure level measurements onboard Ship.

14.2 Supervisor

The supervisor shall have a minimum of 2 years of experience as an operator in sound pressure level measurements.

14.3 Operators

The operator is to have the following qualifications:

- Knowledge in the field of noise, sound measurements and handling of measurement equipment
- Adequate knowledge of the applicable international requirements (SOLAS Regulation II-1/3-12, as amended, and IMO Code on noise levels onboard Ships, as amended,)
- At least 1 year's experience, including participation in a minimum of 5 measurement campaigns as an assistant operator
- Training concerning the procedures specified in IMO Code on Noise Levels onboard Ships
- Be able to document theoretical and practical training onboard in using a sound level meter

14.4 Equipment

14.4.1 Sound level meters

Measurement of sound pressure levels shall be carried out using precision integrating sound level meters. Such meters shall be manufactured to IEC 61672-1(2002-05)1, as amended, type/class[1] standard as applicable, or to an equivalent standard acceptable to the Administration[2].

[1] Recommendation for sound level meters.
[2] Sound level meters class/type 1 manufactured according to IEC 651/IEC 804 may be used until 1 July 2016.

14.4.2 Octave filter set

When used alone, or in conjunction with a sound level meter, as appropriate, an octave filter set shall conform to IEC 61260 (1995)[3], as amended, or an equivalent standard acceptable to the Administration.

[3] Octave-band and fractional-octave-band filters

14.4.3 Sound Calibrator

Sound calibrators shall comply with the standard IEC 60942 (2003-01), as amended, and shall be approved by the manufacturer of the sound level meter used.

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14.4.4 Calibration

Sound Calibrator and sound level meter shall be verified at least every two years by a national Standard laboratory or a competent laboratory accredited according to ISO 17025 (2005), as amended. A record with a complete description of the equipment used shall be kept, including a calibration log.

14.4.5 Microphone wind screen

A microphone wind screen shall be used when taking readings outside, e.g. on navigating bridge wings or on deck, and below deck where there is any substantial air movement. The wind screen should not affect the measurement level of similar sounds by more than 0.5 dB(A) in “no wind” conditions.

14.5 Procedures and instructions

14.5.1 The supplier shall have documented procedures and instructions to carry out service of the equipment.

Documented work procedures are at least to contain information on inspection preparation, selection and identification of sound level measurement locations, calibration checks and report preparation.

14.5.2 The supplier shall have access to the following documents:

- SOLAS 1988, as amended (Reg.II-1/3-12)
- Resolution A.468(XII) and IMO Resolution MSC.337(91) code on noise levels on board ships
- Resolution A.343(IX) Recommendation on methods of measuring noise levels at listening posts
- The Society’s Rules and Guidelines

14.6 Reporting

A noise inspection report shall be made for each ship. The report shall comprise information on the noise levels in the various spaces on board. The report shall show the reading at each specified measuring point. The points shall be marked on a general arrangement plan, or on accommodation drawings attached to the report, or shall otherwise be identified.

The format for noise inspection reports is set out in appendix 1 of IMO Code on Noise Levels onboard Ships and may conform to any other specific requirement of the society (refer to IMO circular MSC.337(91)).

14.7 Verification

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

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15. Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service

15.1 Extent of engagement

Firms carrying out the following:

- Global Vacuum Testing of Primary and Secondary Barriers
- Acoustic Emission (AE) Testing
- Thermographic Testing

15.2 Requirements for firms engaged in global testing of primary and secondary barriers

15.2.1 Testing Procedures – Testing is to be carried out in accordance with cargo containment system designer's procedures as approved by the society.

15.2.2 Authorization – The supplier is to be authorized by the system designer to carry out the testing.

15.2.3 Equipment – Equipment is to be maintained and calibrated in accordance with recognized national or international industrial standards.

15.2.4 Reporting – The report is to contain the following:

- Date of testing
- Identity of test personnel
- Vacuum decay data for each tank
- Summary of test results

15.3 Requirements for firms engaged in acoustic emission (AE) testing

15.3.1 Testing procedures – The supplier is to have documented procedures based upon recognized national or international industrial standards to perform ultrasonic leak test using AE sensors for the secondary barrier of membrane cargo containment systems. The procedures are to include details of personnel responsibilities and qualification, instrumentation, test preparation, test method, signal processing, evaluation and reporting.

Note: The differential pressure during testing should not exceed the containment system designer's limitations.

15.3.2 Supervisor – The responsible supervisor shall be certified to a recognized national or international industrial standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) and have one year experience at Level II.

15.3.3 Operators – The operators carrying out the acoustic emission (AE) testing shall be certified to a recognized national or international industrial standard (e.g. Level I, ISO-9712 as amended or SNT-TC-1A as amended) and shall have adequate knowledge of ship structures sufficient to determine sensor placement.

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15.3.4 Equipment – Equipment is to be maintained and calibrated in accordance with recognized national or international industrial standards or equipment manufacturer's recommendations.

15.3.5 Evaluation of acoustic emission (AE) testing – Must be carried out by the supervisor or individuals certified to a recognized national or international industrial standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) and have one year experience at Level II.

15.3.6 Reporting – The report is to contain the following:

- Date of testing
- Supervisor and operator(s) certifications
- Description of time and pressure of each cycle of test
- List and sketch detailing location of possible defects

15.4 Requirements for firms engaged in thermographic testing

15.4.1 Testing Procedures – Testing is to be carried out in accordance with the cargo containment system designer's procedures as approved by the society.

15.4.2 Authorization – The supplier is to be authorized by the system designer to carry out the testing.

15.4.3 Supervisor – The responsible supervisor shall be certified to a recognised national or international industrial standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. SNT-TC-1A certified personnel must provide evidence that training on Level II or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme.

15.4.4 Operators – The operators carrying out the imaging shall be certified to a recognized national or international industrial standard (e.g. Level I, ISO-9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing and shall have adequate knowledge of ship structures sufficient to determine position for each identified image, and of the containment system to understand the basis of the testing. SNT-TC-1A certified personnel must provide evidence that training on Level I or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme.

15.4.5 Equipment – Thermal cameras and sensors are to be in accordance with the system designer's procedures with regards to sensitivity, accuracy and resolution.

Equipment are to be in accordance with recognized standard (IEC, etc.) with regards their safety characteristics for the use in hazardous areas (in gas explosive atmosphere), maintained and calibrated in accordance with the maker's recommendations.

15.4.6 Evaluation of thermographic images – Must be carried out by the supervisor or individuals certified to a recognized national or international industrial standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. SNT-TC-1A certified personnel must provide evidence that training on

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Level II or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme.

15.4.7 Reporting – The report is to contain the following:

- Date of testing
- Supervisor and operator(s) certifications
- Differential pressures of all phases
- List and sketch detailing location of thermal indications
- Thermographic images of all phases of testing for thermal indications
- Evaluation of thermal images indicating possible leaks

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16. Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.

16.1 Definitions:

- Close-Up Survey: A Close-Up Survey is a survey where the details of structural components are within the close visual inspection range of the surveyor i.e. normally within reach of hand.

- Remote Inspection Techniques (RIT): RIT is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor (refer to Rec.42). Remote inspection techniques may include the use of:

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

16.2 Extent of engagement – Close-up Survey of ships' structure and mobile offshore units' structure by remote inspection techniques. For in-water close-up survey of the internal compartments by Remotely Operated Vehicle (ROV), suppliers are also to hold separate approval as a "Firm carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV)" (see Annex 1, Section 3).

16.3 Training and qualification of operators – The supplier is responsible for the training and qualification of its operators to undertake the remote inspections. UAV Pilots are to be qualified and licenced in accordance with applicable national requirements or an equivalent industrial standard acceptable to the society.

Knowledge of the following shall be documented:

- Marine and/or offshore nomenclatures.
- The structural configuration of relevant ships types and MOUs, including internal structure.
- The remote inspection equipment and its operation.
- Survey plans for examination of hull spaces of various configurations, including appropriate flight plans if using a UAV.
- Thickness measurement (TM) and non-destructive test (NDT) in accordance with a recognised National or International Industrial NDT Standard when these are part of the service. Suppliers undertaking TMs are to hold separate approval as a 'Firm engaged in thickness measurements on ships' (see Annex 1, Section 1).

16.4 Training Plan – the supplier is to maintain a documented training plan for personnel. The plan shall include requirements for training in the minimum Rule requirements for the structure of relevant ships types and MOUs, the recognition of structural deterioration (including corrosion, buckling, cracking and deteriorated coatings) and use of the reporting system.

16.5 Supervisor – The supervisor shall be certified according to the recognized national requirements or an equivalent industrial standard (e.g. XXX Level) and shall have a minimum of two years' experience in the inspection of ship's and/or MOU's structure.

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16.6 Operators – The operator carrying out the inspection shall certified according to the recognized national requirements or an equivalent industrial standard (e.g. YYY Level) and have had at least one year's experience as an assistant carrying out inspections of ship's and/or MOU's structure (including participation in a minimum of five different assignments). The operators of those RIT which require, according to the international and national legislations, to be licensed for their use shall hold valid documentation issued by the appropriate Bodies (e.g. UAV Pilots are to be qualified and licenced in accordance with applicable national requirements).

16.7 Equipment – The following shall be available:

- Remotely operated platform with data capture devices capable of operation within an enclosed space.
- Means of powering the platforms with sufficient capacity to complete the required inspections, including spare batteries if applicable.
- Data collection devices which may include cameras capable of capturing in high definition both video images and still images.
- Illumination equipment.
- High definition display screen with live high definition feed from inspection cameras.
- (When this is part of the RIT).
- Means of communication.
- Data recording devices, as applicable.
- Equipment for carrying out thickness gauging and/or non-destructive testing, as relevant to the work to be performed (when this is part of the service).

16.8 Procedures and guidelines – The supplier shall have documented operational procedures and guidelines for how to plan, carry out and report inspections; how to handle/operate the equipment; collection and storage of data. These shall include:

- Requirements for preparation of inspection plans when UAV are part of the equipment flight plans shall be included.
- Operation of the remotely operated platforms.
- Operation of lighting.
- Calibration of the data collection equipment.
- Operation of the data collection equipment.
- Two-way communication between the operator, platform, Surveyor, other personnel such as support staff and ships officers and crew.
- Guidance of the operator to provide complete coverage of the structure to be inspected.
- Guidance for the maintenance of the remotely operated platforms, data capture and storage devices and display screens, as applicable.
- Requirements for the collection and validation of data.
- If data is to be stored, then requirements for location attribution (geo-tagging), validation and storage of data.
- Requirements for the reporting of inspections, including the recording of damages and defects found during inspection and repair work.

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16.9 Documentation and records - The supplier shall maintain the following:

- Records of training.
- Operator statutory and regulatory certificates and licences.
- Equipment register for UAVs, Robots, data collection devices, data analysis devices and any associated equipment necessary to perform inspections.
- Equipment maintenance manuals and records / logbook.
- Records of calibration.
- UAV / Robot operation logbook.

16.10 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by the attending Surveyor(s) signature.

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17. Firms engaged in Watertight Cable Transit Seal Systems Inspection on Ships and Mobile Offshore Units.

17.1 Extent of engagement

17.1.1 Inspection of the Watertight Cable Transit Seal Systems for compliance with the relevant approval certificates and product installation manuals, (types of penetrating cables, dimensions, fill ratio and insulation details, as applicable).

17.2 Extent of Approval

17.2.1 The contents of this procedure apply equally to manufacturers or shipyards when they are acting as Service Suppliers.

17.2.2 Any Service Supplier engaged in the inspections of watertight cable transit seal systems shall be qualified in these inspections for each make and type of equipment for which they provide the inspection, and provide manufacturers documentary evidence that they have been so authorized or they are certified in accordance with an established system for training and authorization.
Such qualification shall include, as a minimum:

- employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or an equipment manufacturer's established certification program. In either case, the certification program shall be based on the paragraph 17.3 for each make and type of equipment for which inspection is to be provided, and

- compliance with provisions of paragraphs 17.4, 17.5 and 17.6.

17.2.3 In cases where an equipment manufacturer is no longer in business or no longer provides technical support, Service Suppliers may be authorised for the equipment on the basis of prior authorization for the equipment and/or long term experience and demonstrated expertise as an authorized service supplier.

17.3 Qualifications and Training of Personnel

17.3.1 Personnel for the work specified in 17.1.1 shall be trained and qualified in the inspection for which they are authorised, for each make and type of equipment for which they provide the inspection.

17.3.2 The education for initial certification of personnel shall be documented and addressed, as a minimum:

- Procedures and instructions for the inspection of the watertight cable transit seal systems

- Common problems found with the initial installation and in-service inspections of watertight cable transit seal systems

- Relevant rules and regulations, including International Conventions

- Procedures for reporting on initial installation and in-service inspections of watertight cable transit seal systems in the Cable Transit Seal Systems Register.

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17.3.3 The education and training for the personnel shall include practical technical training on actual inspection using the watertight cable transit seal systems for which the personnel are to be certified. The technical training shall include disassembly, reassembly and adjustment of the equipment. Classroom training shall be supplemented by field experience in the inspections for which certification is sought, under the supervision of an experienced senior certified person.

17.3.4 At the time of initial certification and at each renewal of certification, the service supplier shall provide documentation to verify personnel's satisfactory completion of a competency assessment using the equipment for which the personnel are certified.

17.3.5 The Service Supplier shall require refresher training as appropriate to renew the certification.

17.4 Reference Documents

The Service Supplier is to have access to the following documents:

- Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals as appropriate.
- Type Approval certificate showing any conditions that may be appropriate during the installation or maintenance of the watertight cable transit seal system.

17.5 Equipment and Facilities

The Service Supplier is to have access to the following:

- Sufficient tools, and in particular any specialized tools specified in the equipment manufacturer's instructions, including portable tools as needed for work to be carried out on board ship.

17.6 Reporting

- On completion of inspection, the Service Supplier will issue a report confirming the condition of the watertight Cable Transit Seal System. They will also record the results of their inspection in the Cable Transit Seal System Register.

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18. Firms engaged in Commissioning Testing of Ballast Water Management Systems (BWMS)

18.1 Extent of engagement - Sampling and Analysis of ballast water and Verification of the self-monitoring equipment during Commissioning Testing of Ballast Water Management Systems (BWMS), for Statutory purposes.

18.2 Procedure

18.2.1 Service suppliers are to have documented procedures including:

- Procedures for sampling collection and handling, analysis, assessment of BWMS correct operations and documenting and reporting. The procedures are to outline how the ballast water sampling and analysis is conducted with respect to each size class of organisms;

- Operating procedures for the ballast water test equipment specified including calibration, adjustment and maintenance

18.2.2 Service Suppliers are to be familiar with the BWMS operation including features and limits of each treatment technology, and self-monitoring parameters.

18.2.3 Service Suppliers are to be accredited to relevant standards such as ISO/IEC 17025 or equivalent, as applicable.

18.2.4 Service Suppliers are to be independent of the BWMS manufacturer or supplier including shipyards.

18.3 Operators – Service Suppliers are expected to be able to perform both the biological sampling and assessment of self-monitoring parameters and has responsibility for document that the requirements to the operator are satisfied. Therefore, operators who conduct commissioning testing are to:

- demonstrate knowledge in the use of different ballast water testing equipment for the purpose of assessing biological efficacy;

- have documented evidence of sufficient engineering and biological knowledge to conduct the commissioning testing;

- have knowledge of IMO BWM.2/Circ.70/Rev.1, as may be amended - 'Guidance for the Commissioning Testing of Ballast Water Management Systems' and IMO BWM.2/Circ.42/Rev.2 - 'Guidance on Ballast Water Sampling and Analysis for Trial Use in accordance with the BWM Convention and Guidelines (G2)', as may be amended;

- (*) be trained in the proper use of portable indicative analysis equipment. Review of training records and/or interviews should be conducted to confirm the equipment will be properly used during testing;

- (*) be familiar with and understand the design concepts of the Guidelines G2 sampling devices installed on the vessel's water ballast system. Personnel shall understand the need to maintain the G2 sampling devices clean and free of contaminants and the importance of controlling the ballast water sample flow rates from the G2 device (to avoid organism mortality in the sample);

- (*) be familiar with the technologies utilized by the indicative sampling equipment and understand water quality issues that are both conducive to successful use of the equipment and circumstances that could challenge the use of the equipment;

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- (*) be trained in the proper disposal procedures for water samples following testing.
- (Δ) have knowledge of the system design limitations of the BWMS (as stated in the BWMS type approval certificate) and knowledge of the BWMS self-monitoring parameters, such as flow rate, pressure, TRO concentration, UV transmittance/intensity, etc, and how the BWMS notifies the operator in case he operates BWMS outside its system design limitations. This knowledge is relevant for evaluating whether the self-monitoring equipment of the BWMS indicates correct operation of the BWMS. In case Service Supplier are not present during ballasting operations, the Service Supplier shall have knowledge of how to access the BWMS log to evaluate that the BWMS operated correctly during ballasting operations;
- (Δ) have the procedures and knowledge to be able to assess the applicable self-monitoring parameters (e.g., flow rate, pressure, TRO, UV intensity, etc.) of the BWMS, taking into account the System Design Limitations of the BWMS;

Notes: (1) the points marked with (*) are qualifications for operators performing sampling and analysis of ballast water; (2) the points marked with (Δ) are the qualifications for operators performing verification of the self-monitoring equipment ;(3) the points above without symbol are the common qualifications for service supplier.

18.4 Equipment and facilities

Equipment, procedures and methods for detailed analysis, where applicable, are to be in accordance with relevant International standard and/or accepted Industry standards. Laboratories conducting sample enumeration are to be accredited to ISO/IEC 17025 standard, or equivalent.

Testing should be conducted using indicative analysis equipment accepted by Society. information and reference to the acceptance documents for the equipment used should be submitted to the Society in the report which includes the results from the commissioning test as per IMO BWM.2/Circ.70/Rev.1, as may be amended. In case the indicative analysis equipment used has not been previously accepted by the Society, the following information is to be submitted to the Society;

- Equipment information - type, model, technology used, evidence of calibration, detection range, Organism type/size classes that can be analyzed.
- Test results conduct for the verification of accuracy, detection range and repeatability.
- Certificate of standards, if available.

For indicative analysis equipment planned to be used, the equipment OEM instruction manuals shall be available. The manuals shall include, at least, clear guidance for the proper storage, handling, operation, maintenance, repair, and calibration.

Note: Each Service Supplier applicant will present the Surveyor their confidential internal procedures for conducting the indicative testing. Not all the equipment listed in the references will be used. For all equipment planned to be used, the instruction manuals shall be available.

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The Service Supplier will need to use specialty devices (e.g., sieves, screens, etc.) to separate the different organism sizes classes (i.e., ≥ 10 µm to < 50 µm, and ≥ 50 µm, and indicator microbes) to support analysis of each size class.

Equipment used for the analysis of other physical-chemical water parameters is to be suitable for the intended use.

Indicative analysis equipment should be properly stored or transported to avoid damage and disturbance to calibrations, etc. when transporting from the Service Suppliers facilities to the vessels.

18.5 Sampling and Analysis

Service Suppliers are to follow relevant guidelines on sampling of ballast water. A standard operating procedure is to be defined for sampling of uptake water. Discharge sampling shall follow the IMO's 'Guidelines for Ballast Water Sampling (G2)'.

The representative samples shall be analyzed as a minimum for the two size classes of organisms, namely ≥ 50 µm and ≥ 10 µm to < 50 µm, specified in IMO Circular BWM.2/ Circ.70/Rev.1 - Guidance for the Commissioning Testing of Ballast Water Management Systems using indicative analysis methods. Detailed analysis of all organism type/size classes or combination of detail and indicative analysis can also be performed.

Service Suppliers shall maintain a record of:

- Operation of the BWMS during test period, including any recorded data or operator observations associated with the performance deviations, alarms or abnormal/unexpected operations.
- Applicable self-monitoring parameters.

In case the commissioning testing requires the Service Supplier’s personnel to work in hazardous areas (e.g., pump room for tankers, etc.), the Service Supplier shall either have equipment certified for the spaces or provide the Surveyor with a list of vessels for which they would not be able to conduct testing.

18.6 Reporting

Service Suppliers are to provide reports detailing the results of sampling and analysis of ballast water and assessment of self-monitoring parameters during commissioning testing. The format is to be acceptable to Society. The report, as a minimum, will contain the following:

- Manufacturer's name
- Model name
- BWMS Technology limiting operating conditions and system design limitations
- Operation required, e.g., ballasting, de-ballast, circulation, one pass, in tank, etc

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- Treatment rated capacity (TRC) in m^3/h

  •Relevant performance parameters (e.g. TRO, UV dose, UVI, flow rate or other relevant performance parameter).

- Alarms developed during operation.
- Installation location.
- Type Approval issued by and Certificate No
- Date installed
- Results of Sample analysis
- Pump flow rate, ballast tanks and volume
- Comments/Options: Filter and other major components, Process measurements.

18.7 Reference Documents

The Service Supplier is to have access to the following documents, as may be amended:

- IMO Resolution MEPC.300(72) — Code for Approval of Ballast Water Management Systems (BWMS Code)
- IMO Resolution MEPC.173(58) — Guidelines for Ballast Water Sampling (G2)
- IMO Circular BWM.2/Circ.42/Rev. 2 — Guidance on Ballast Water Sampling and Analysis for Trial Use in accordance with the BWM Convention and Guidelines (G2)
- IMO Circular BWM.2/Circ.70/Rev.1 - Guidance for the Commissioning Testing of Ballast Water Management Systems
- IMO Circular BWM.2/Circ.61 - Guidance on Methodologies that may be used for Enumerating Viable Organisms for Type Approval of Ballast Water Management Systems
- IMO Circular BWM.2/Circ.69 - Guidance on System Design Limitations of Ballast Water Management Systems and their Monitoring
- IMO Resolution MEPC.279(70) - 2016 Guidelines for Approval of Ballast Water Management Systems (G8)
- IMO Resolution A.1120(30) – Survey Guidelines under the Harmonized System of Survey and Certifications (HSSC), 2017 (for BWMS that were Type Approved to the 2016 G8)

End of Document