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# Procedures for Approval of Service Suppliers



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# PART 1: Approved Service Suppliers – General Requirements

## 1.1. Objective

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. Approvals against these requirements will be provided by members of the Lloyd's Register Group (hereinafter referred to as "Lloyd's Register").

## 1.2. Introduction

### 1.2.1. 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 Lloyd's Register, 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 drilling 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 certifications and services.
- **Agent:** A Person or Company authorised to act for or to represent a Manufacturer or approved/recognised Service Supplier.
- **Subsidiary:** A Company partly or wholly owned by a Manufacturer or approved/recognised Service Supplier.
- **Subcontractor:** A Person or Company providing services to a Manufacturer or approved/recognised Service Supplier, with a formal contract defining the assumption of the obligations of the Service Supplier.

### 1.2.2. Application

Suppliers providing services on behalf of the Owner/Operator of a ship or a mobile offshore unit (such as measurements, tests, surveys or maintenance of safety systems and equipment), the results of which are used by Lloyd's Register Surveyors in making decisions affecting Certification, are subject to approval by Lloyd's Register.

Lloyd's Register Surveyors will approve Service Suppliers in accordance with these requirements, except where otherwise instructed by the relevant Flag State Administration.

In addition to the General Requirements applicable to all Service Suppliers, the Specific Requirements applicable to certain Service Suppliers in [Part 2](#) of this document are also to be complied with.

This Procedure applies to the approval of the following categories of Service Suppliers, whose results are used by Lloyd's Register Surveyors in making decisions affecting Certification:

### 1.2.3. For Statutory Purposes

- Servicing of inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats and marine evacuation systems.
- Surveys and testing of radio communication equipment.
- Inspections and maintenance of self-contained breathing apparatus.

- Annual performance testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR).
- Inspections of Low-Location Lighting (LLL) systems using photo luminescent materials and evacuation guidance systems used as an alternative to Low-Location Lighting (LLL) systems.
- Sound pressure level measurements of Public Address and General Alarm systems.
- EPIRB shore-based maintenance facilities.
- Servicing of immersion suits, thermal protective aids, chemical protective suits.
- Servicing and maintenance of lifeboats, launching appliances, on-load release gear and davit-launched liferaft automatic release hooks.
- Inspection, performance testing and maintenance of Automatic Identification Systems (AIS), Long Range Identification and Tracking (LRIT) Systems, and Ship Security Alert (SSA) Systems.
- Hydraulic tests of low and high pressure cylinders.
- Inspection and testing of centralised gas welding and cutting equipment.

#### 1.2.4. For Classification and/or Statutory Purposes

- In-Water surveys (IWS) of ships and mobile offshore units.
- Inspections and maintenance of fire-extinguishing equipment and systems.
- Tightness testing of closing appliances such as hatches, doors, etc. with ultrasonic equipment.
- Examination of Ro-Ro ship's bow, stern, side and inner doors.
- Surveys, servicing and testing of lifting appliances.
- Surveys of repairs of fibre reinforced composite craft.
- Surveys of repairs to wooden vessels.
- Measurements of noise level on board ships.
- Tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service.
- Visual/sampling checks and testing for hazardous materials, such as asbestos, PCBs, TBTs and CFCs on board ships.
- Installation and inspection of cable and pipe transits.

There are separate procedures for Service Suppliers involved in:

- Thickness measurements on ships and mobile offshore units – Refer to MQPS, Book N, 17-1.
- Testing of coating systems in accordance with [IMO Resolution MSC.215\(82\)](#), as amended, and [IACS UI SC223](#) and/or [IMO Resolution MSC.288\(87\)](#), as amended – Refer to MQPS, Book P, 19-1.

#### 1.2.5. For Classification Purposes

- Surveys of masts and rigging.
- Condition Monitoring Service Suppliers.

#### 1.2.6. Non-mandatory Approvals

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:

- Surveys of Low-Location Lighting (LLL) systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems.
- Sound pressure level measurements of public address and general alarm systems on board ships.
- Measurements of noise level onboard ships.
- Testing of coating systems in accordance with [IMO Resolution MSC.215\(82\)](#), as amended, and [IACS UI SC223](#) and/or [IMO Resolution MSC.288\(87\)](#), as amended.
- Examination of Ro-Ro ship's bow, stern, side and inner doors.
- Hydraulic tests of low and high pressure cylinders.
- Inspection and testing of centralised gas welding and cutting equipment.

### 1.3. General Requirements Applicable to All Service Suppliers

#### 1.3.1. Service Suppliers

Service Suppliers are to demonstrate that they have the competence and control needed to perform the services for which approval is sought.

#### 1.3.2. Training of Personnel

Service Suppliers are responsible for the qualification and training of their personnel to a recognised National, International or Industry Standard, as applicable. Where such Standards do not exist, Service Suppliers are to define standards for the training and qualification of their personnel relevant to the functions each is authorised to perform.

The personnel are also to have adequate experience and be familiar with the operation of any necessary equipment. Operators/technicians/inspectors are to have had a minimum of one (1) 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.

#### 1.3.3. Supervision

Service Suppliers are to provide supervision for all services provided. Responsible supervisors are to have had a minimum of two (2) years of experience as operators/technicians/inspectors within the activity for which Service Suppliers are approved.

For a Service Supplier consisting of one person, that person is to meet the requirements of a supervisor.

#### 1.3.4. Servicing Stations

Where several servicing stations are owned by a given Company, each station is to be assessed and approved except as specified in [Section 1.6.2](#).

#### 1.3.5. Personnel Records

Service Suppliers are to keep records of the approved operators/technicians/inspectors. These records are to contain information on age, formal education, training and experience for the services for which they are approved.

### **1.3.6. Equipment and Facilities**

Service Suppliers are to have the necessary equipment and facilities for the services to be supplied. A record of the equipment used is to be kept and available. The record is to contain information on maintenance and results of calibration and verifications. Lloyd's Register shall assess and record the validity of previous measuring results when the equipment is found not to conform to requirements. Lloyd's Register shall take appropriate action on the equipment affected.

### **1.3.7. Control of Data Equipment and Facilities**

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. word-processing, 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.

### **1.3.8. Procedures**

Service Suppliers are to have documented work procedures covering all services supplied.

### **1.3.9. Sub-contractors**

Service Suppliers are to provide information of agreements and arrangements if any parts of the services provided are sub-contracted. Particular emphasis is to be given to quality management by Service Suppliers in following-up of such sub-contracts. Sub-contractors providing anything other than equipment are also to meet the requirements of the primary Service Supplier.

### **1.3.10. Verification**

Service Suppliers are to verify that the services provided are carried out in accordance with approved procedures.

### **1.3.11. Reporting**

Service Suppliers are to provide reports detailing the results of surveys, measurements, tests, maintenance and/or repairs carried out. The format of the report is to be acceptable to Lloyd's Register.

Where applicable, Lloyd's Register will provide report forms.

### **1.3.12. Service Supplier's Report**

The Service Supplier's report is to include a copy of the valid 'Certificate of Approval of Service Suppliers' issued by Lloyd's Register. Alternatively, the report is to include a copy of the valid 'Certificate of Approval of Service Suppliers' if not approved by Lloyd's Register.

### **1.3.13. Service Supplier's Relations with the Equipment Manufacturer**

A Supplier which works as a service station on behalf of a Manufacturer of equipment (and as a Service Supplier in this field), will be assessed by the Manufacturer and nominated as their agent. The Manufacturer should ensure that appropriate instruction manuals, materials, etc., and proper training of technicians are available for the agent. Such Service Suppliers will be approved on a case-by-case basis in accordance with this Procedure, except as specified separately.

#### 1.3.14. Auditing of the Service Supplier

Upon reviewing the submitted documents with satisfactory result, the Service Supplier is audited in order to ascertain that the Service 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.

#### 1.3.15. Certification

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 Lloyd's Register Surveyors, since the previous audit is sufficient to satisfy this requirement.

#### 1.3.16. Documented Procedures and Instructions

Documented procedures and instructions should be available for the recording of damages and defects found during inspection, servicing and repair work. This data is to be made available to the local Lloyd's Register Office upon request.

#### 1.3.17. Specific Flag Requirements

Some Flag State Administrations may have requirements in addition to those stated in these Procedures. Flag State Administration requirements should be determined before any services are offered.

### 1.4. Additional Reference Documents

- ISO 9000 2005 – Quality Management Systems – Fundamentals and Vocabulary.

### 1.5. Procedure for Approval

#### 1.5.1. Submission of Documents

The following documents are to be made available to local Lloyd's Register Office for review:

- Outline of Company (e.g. organisation and management structure) including subsidiaries is 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 authorisation from Manufacturers, Manufacturer's documentary evidence that the Service Supplier has been authorised 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.
- Checklists and record formats for recording results of the services provided.

- Quality Manual and/or documented procedures covering requirements given [below](#).
- 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 any activities that represent a conflict of interest.
- Record of customer complaints and of corrective actions requested by certification bodies.

## 1.6. Pre-requisites for Approval

### 1.6.1. Quality Assurance System

Service Suppliers are to 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 of operations to ensure compliance with the approved 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.

### 1.6.2. Documented Quality System

A documented Quality System complying with the most current version of the ISO 9000 series that includes the above items will be considered acceptable.

If Manufacturers of equipment (and/or its Service Suppliers) apply to Lloyd's Register for inclusion of its nominated agents and/or subsidiaries 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 local Lloyd's Register Office will verify the adherence to this Quality System by performing audits on each affiliate against the most current version of the ISO 9000 series.

### 1.6.3. Alterations to the Certified Approved Service Supplier System

In cases where an alteration affecting the certified service operation system of the Service Supplier is made, such an alteration is to be IMMEDIATELY informed to the local Lloyd's Register office in writing. An audit may be required when deemed necessary to ensure continued validity of the Certificate of Approval.

## 1.7. Certification and Documentation

### 1.7.1. Certification

Upon satisfactory completion of both the audit of the Service Supplier and the demonstration test, as applicable, the local Lloyd's Register Office will issue a Certificate of Approval. The Certificate will 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.

### 1.7.2. Renewal of the Certificate

Renewal of the Certificate is made at intervals not exceeding three (3) 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, Lloyd's Register is to be informed in due course by the Service Supplier.

### 1.7.3. Existing Approvals

Approvals granted before the implementation of this procedure may remain valid as stated in the respective Certificates for a period up to but not exceeding three (3) years. Renewals of such Certificates have to be carried out in accordance with this procedure.

## 1.8. Approved Service Supplier Database

Upon satisfactory completion of the approval and certification process, the Service Supplier will be included in Lloyd's Register's Database of Approved Service Suppliers on Class Direct.

## 1.9. Cancellation of Approval

### 1.9.1. Cancellation Cases

Lloyd's Register reserves the right to cancel the approval and to inform the IACS Members accordingly.

Approval by the approving Lloyd's Register Office may be cancelled in the following cases:

- Where the service was improperly carried out or the results were improperly reported.
- Where the Service Supplier has not taken appropriate corrective actions to rectify deficiencies previously reported by Lloyd's Register to the Service Supplier.
- Where alterations have been made to the Company's approved Quality System without written notification to and approval of Lloyd's Register.
- Where the required audits have not been carried out.
- Where wilful acts or omissions are ascertained.
- Where any deliberate misrepresentation has been made by the Service Supplier.
- Where the Company's approval has been withdrawn or withheld by another IACS member.

Expiration or cancellation of the Supplier's parent Company approval automatically invalidates approval of all agents and subsidiaries if these are certified according to [Section 1.6.2](#).

### 1.9.2. Re-approval After Cancellation

A Service Supplier whose approval is cancelled may apply for re-approval provided that the non-conformities which resulted in cancellation have been corrected, and that Lloyd's Register is able to confirm that the Service Supplier has effectively implemented corrective action(s).

This possibility is not open if the cancellation is based on a grave fault, such as a violation of ethics.



## PART 2: Approved Service Suppliers – Specific Requirements

### 2.1. Requirements for Service Suppliers Engaged in Tightness-testing of Closing Appliances such as Hatches, Doors, etc., with Ultrasonic Equipment

#### 2.1.1. Extent of Engagement

Ultrasonic tightness-testing of closing appliances, such as hatches, doors, etc., for Classification and/or Statutory purposes.

#### 2.1.2. Operators

Operators are to:

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

#### 2.1.3. Procedures

Service Suppliers are to have documented work procedures that include the manual for all the ultrasonic equipment specified, its adjustment, its maintenance, its operation and approval criteria.

#### 2.1.4. Equipment and Facilities

The ultrasonic equipment to be used is to be Type Approved by Lloyd's Register. It is to be demonstrated to the attending Surveyor(s) that the equipment is fit for the purpose of detecting leakages in closing appliances.

## 2.2. Requirements for Service Suppliers Engaged in Carrying out In-Water Survey (IWS) of Ships and Mobile Offshore Units

### 2.2.1. Extent of Engagement

In-Water Survey (IWS) of ships and mobile offshore units by diver or Remote Operated Vehicle, for Classification purposes.

### 2.2.2. Training of Personnel

Service Suppliers are responsible for the qualification of its divers and the diving equipment utilised when carrying out the In-Water Survey (IWS).

A plan for training of personnel in the reporting system, minimum Rule requirements for relevant vessel/installation types, vessel's/installation's under-water structure, measuring of bearing clearances, the recognition of corrosion damage, buckling and deteriorated coatings, etc. is to be included.

### 2.2.3. Supervision

Supervisors are to be qualified according to the Service Suppliers' general requirements and are to have a minimum of two (2) years' experience as a diver carrying out surveys.

### 2.2.4. Divers

Divers carrying out surveys are to have had at least one (1) years' experience as an assistant diver carrying out surveys for a minimum of ten (10) different assignments.

### 2.2.5. Personnel Records

Knowledge of the following is to be documented:

- Bearing clearance measurements on rudders and tailshafts.
- Operation of under-water communication system.
- Special equipment and tools, e.g. hull cleaners, grinders, cutters, etc.
- Vessel's/installation's or unit's under-water structure and appendages, tailshaft, propeller, rudder and its bearings, etc.
- Under-water thickness gauging and Non-Destructive Testing (NDT) in accordance with a recognised National or International Industrial Non-Destructive Examination (NDE) Standard. This requirement only applies if an In-Water Survey (IWS) Company performs Non-Destructive Testing (NDT).
- Under-water video monitoring with TV-monitors on deck, as well as still-picture work.
- Operation of Remote Operated Vehicles, if applicable.

### 2.2.6. Procedures

Service Suppliers are to have documented operational procedures and guidelines on how to carry out the survey and how to handle the equipment, including:

- guidance of the diver along the hull to provide complete coverage of the parts to be surveyed;
- two-way communication between diver and surface (support) staff;
- video recording and closed circuit television operation; and
- guidance for the operation and maintenance of the Remote Operated Vehicle, if applicable.

### 2.2.7. Equipment

The following are to be available:

- Colour closed circuit television (CCTV) with sufficient illumination equipment.
- Equipment for carrying out thickness gauging, non-destructive testing and measurements (e.g. clearances, indents, etc.) as applicable to the work to be performed.
- Equipment for cleaning of the hull.
- Still photography camera.
- Two-way communication between diver and surface (support) staff.
- Video recording device connected to the closed circuit television (CCTV).
- Remote Operated Vehicle, if applicable.

### 2.2.8. Verification

The Service Suppliers are to have each job separately verified by the attending Lloyd's Register Surveyor(s), documented in the Report(s) by the attending Surveyor(s) signatures.

## 2.3. Requirements for Service Suppliers Engaged in Examination of Ro-Ro Ships Side, Bow and Stern Doors Including Inner Doors

### 2.3.1. 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, for Classification and/or Statutory purposes.

### 2.3.2. Extent of Approval

Service Suppliers are to be certified to the most current version of the ISO 9000 series.

### 2.3.3. Training of Personnel

Operators carrying out Non-Destructive Examination (NDE) are to be qualified to a recognised National or International Standard for the methods used.

### 2.3.4. Supervision

Supervisors - In addition to the requirement to have had a minimum two (2) years' experience as operator/technician/inspector within the activity, a Senior Service Engineer (Supervisor) is to have a minimum two (2) years' related education from a technical school.

### 2.3.5. Procedures

Service Suppliers are to use, complete and sign a checklist that is acceptable to Lloyd's Register.

### 2.3.6. Reference Documents

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

- LR – Annual Surveys/Intermediate Surveys/Docking Surveys Survey Checklist (LR Form 2100A).
- 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.
- [IACS UR Z24 – Survey Requirements for Shell and Inner Doors of Ro-Ro Ships](#).

Service Suppliers are to have access to drawings and documents, including the Operating and Inspection Manual.

Service Suppliers are to have access to the service history of the doors.

### 2.3.7. Equipment and Facilities

The following equipment should be provided:

#### For inspection of supporting securing and locking devices, hinges and bearings:

- Equipment for measuring clearances (i.e. feeler gauges, Vernier callipers, micrometers).
- Non-Destructive Examination (NDE) (i.e. Dye Penetrant (DP), Magnetic Particle Inspection (MPI)).

**For tightness-testing:**

- Ultrasonic leak detector or equivalent.

**For inspection of hydraulic operating system:**

- Pressure gauges.
- Particles counter for analysing the quality of hydraulic fluid.

**For inspection of electric control system and indication system:**

- Digital multi-meter.
- Earth fault detector.

## 2.4. Requirements for Service Suppliers Engaged in Inspections and Maintenance of Fire-Extinguishing Equipment and Systems

### 2.4.1. Extent of Engagement

Inspections and maintenance of fire-extinguishing equipment and systems, for Statutory purposes.

### 2.4.2. 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(s) being sought.

### 2.4.3. 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).

### 2.4.4. 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, issued by Lloyd's Register, a full IACS Member or a Flag State Administration who is a signatory to the International Convention on the Safety of Life at Sea (SOLAS), 74/78, as amended, showing any conditions that may be appropriate during the servicing and/or maintenance of fire-extinguishing equipment and systems.
- [IMO MSC.1/Circ.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.
- IMO MSC/Circ.670 – Guidelines for the Performance and Testing Criteria and Surveys of High Expansion Foam Concentrates for Fixed Fire-Extinguishing Systems.
- IMO MSC/Circ.798 – Guidelines for the Performance and Testing Criteria and Surveys of Medium Expansion Foam Concentrates for Fixed Fire-Extinguishing Systems.
- IMO MSC/Circ.799 – Guidelines for the Performance and Testing Criteria and Surveys of Expansion Foam Concentrates for Fixed Fire-Extinguishing Systems of Chemical Tankers.
- [IMO 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 [IMO MSC/Circ.1312/Corr.1](#).

- IMO MSC.1/Circ.1432 – Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems and Appliances.
- IMO MSC.1/Circ.1516 – Amendments to the Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems and Appliances (MSC.1/Circ.1432).
- [IMO Res. A.951\(23\) – Improved Guidelines for Marine Portable Fire Extinguishers.](#)
- [IMO 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.

#### **2.4.5. Equipment and Facilities - General Requirements**

If Service Suppliers undertake shore-based inspecting and maintenance, the workshops are to be clean, suitably ventilated and arranged, 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.

#### **2.4.6. Equipment**

Sufficient and appropriate spares and tools are to be available, 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 Manufacturers.
- Level measuring equipment for bottles.
- Recharging facilities for pressurized bottles, extinguishers and cartridges.

## 2.5. Requirements for Service Suppliers Engaged in Servicing of Inflatable Liferafts, Inflatable Lifejackets, Hydrostatic Release Units, Inflatable Rescue Boats and Marine Evacuation Systems

### 2.5.1. Extent of Engagement

Servicing of inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats and/or marine evacuation systems, for Statutory purposes.

### 2.5.2. Extent of Approval

Service Suppliers are to provide evidence that they have been authorised or licensed to service/repair the particular make(s) and model(s) of equipment for which approval is sought, by the equipment Manufacturer's.

### 2.5.3. Procedures

Service Suppliers are to have documented procedures and instructions on how to carry out service/repair of equipment.

Where inflatable liferafts are subject to extended service intervals in accordance with the requirements of the International Convention on the Safety of Life at Sea (SOLAS), 74/78, Ch.III, Reg.20.8.3, then [IMO MSC.1/Circ.1328](#) should be followed in addition to [IMO Resolution A.761\(18\)](#), as amended by [IMO Resolution MSC.55\(66\)](#) and [IMO Resolution MSC.388\(84\)](#).

### 2.5.4. 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 [IMO Resolution MSC.55\(66\)](#) and [IMO Resolution MSC.388\(94\)](#).
- [IMO Resolution MSC.55\(66\) – Amendments to the Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts \(Resolution A.761\(18\)\)](#).
- [IMO Resolution MSC.388\(94\) – Amendment to the Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts \(Resolution A.761\(18\)\)](#).
- [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, issued by Lloyd's Register, another full IACS Member or a Flag State Administration who is a signatory to the International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended, 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.
- [IMO LSA Code/Ch. IV, 1995 SOLAS Conference Resolution 4 regarding Marine Evacuation Systems](#).

### 2.5.5. Equipment and Facilities

Refer to [IMO Res. A.761\(18\)](#), as amended by [IMO Res. MSC.55\(66\)](#) and [IMO Res. MSC.388\(94\)](#), which shall be observed as relevant.

Where inflatable liferafts are subject to extended service intervals, [IMO MSC.1/Circ.1328](#) should also be followed.



## 2.6. Requirements for Service Suppliers Engaged in Surveying and Testing of Radio Communication Equipment

### 2.6.1. Extent of Engagement

Surveys, inspection, testing, and/or measurement of radio equipment aboard ships or mobile offshore units for compliance with the International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended, for Statutory purposes.

Annual testing of 406 MHz satellite EPIRBs for compliance with SOLAS Ch. IV, Reg. 15.9.

The principles of this section may also be applied to Service Suppliers involved in inspection, performance testing and maintenance of Automatic Identification Systems (AIS), Long Range Identification and Tracking (LRIT) Systems and Ship Security Alert (SSA) Systems. The Service Supplier is to be familiar with the equipment with which they will be involved, such as being a service agent for the equipment Manufacturer.

Radio inspectors are not to carry out installation of equipment or repairs or maintenance on ships where they will be engaged in the survey of the radio communication equipment of that ship.

### 2.6.2. Supervisors

Supervisors are to:

- have a minimum of two (2) years' related education from a technical school and experience as inspector;
- be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure; and
- preferably hold a General Operator's Certificate (GOC) or a GMDSS Radioelectronic Certificate (REC), recognised by the ITU, to operate or test radio transmitters.

### 2.6.3. Radio Inspectors

Radio Inspectors carrying out the service are to:

- have passed the internal training of the Service Supplier in radio telephony, GMDSS, and Initial and Renewal Surveys and have at least one (1) year's technical school training or, as alternative, hold evidence that he followed a technical course approved by the relevant Administration, and at least one (1) year experience as an assistant radio inspector;
- be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure; and
- 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).

### 2.6.4. Procedures

Service Suppliers are to have documented procedures and instructions on how to carry out testing and examination of radio equipment.

Procedures and instructions for operating each item of the testing/inspection equipment are also to be kept and be available at all times.

Procedures and instructions are to refer to the relevant reference documents, to the various Lloyd's Register Safety Radio Forms and Lloyd's Register's procedures that have a direct bearing on the actions of the Service Supplier.

### 2.6.5. Reference Documents

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

- IMO International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended.
- [IMO Resolution A.789\(19\) – Specifications on the Survey and Certification Functions of Recognised Organisations Acting on Behalf of the Administration.](#)
- IMO MSC/Circ.1040/Rev.1 – Guidelines on Annual Testing of 406 MHZ Satellite EPIRBs.
- [IMO MSC.1/Circ.1252 – Guidelines on Annual Testing of the Automatic Identification System \(AIS\).](#)
- IMO [SN/Circ.227](#), [SN/Circ.227/Corr.1](#) and [SN/Circ.245](#) – Guidelines for the Installation of a Shipborne Automatic Identification System (AIS), and amendments thereto.
- [IMO MSC.1/Circ. 1296 – Guidance on the Survey and Certification of Compliance with the Requirement to Transmit LRIT Information.](#)
- [IMO MSC/Circ.1072 – Guidance on Provision of Ship Security Alert Systems.](#)
- IMO Performance Standards for the equipment for which the Service Supplier is approved.
- ITU – Radio Regulations.
- Flag State Administration requirements.
- LR – Instructions to Radio Surveyors, forms and checklists.

### 2.6.6. Equipment and Facilities

Service Suppliers are to have the major and auxiliary equipment required for correctly performing the inspection (see below). A record of the equipment used is to be kept, containing information on Manufacturer and type of equipment, and a log of maintenance and calibrations.

A Standard that is relevant to the radio equipment to be tested is to be available and is to be cited in the inspection Report.

For equipment employing software in conjunction with the testing/examination, such software is to be fully described and verified.

The Radio Survey is to be carried out using suitable test equipment capable of performing all the necessary measurements. However, the minimum requirement for instrumentation is as follows:

- 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 emission from Free-Float Satellite EPIRBs.
- Equipment for testing the performance of Automatic Identification Systems (AIS).

## 2.7. Requirements for Service Suppliers Engaged in Inspection and Testing of Centralised Gas Welding and Cutting Equipment

### 2.7.1. Extent of Engagement

Inspection and testing of centralised gas welding and cutting equipment, for Statutory purposes.

### 2.7.2. Extent of Approval

Service Suppliers are to have documents and have demonstrated that they have professional knowledge of gas welding and cutting and of associated central gas installation systems to make the necessary evaluations of the condition of the equipment.

In demonstrating professional knowledge, Service Suppliers are to have an understanding of the hazards involved with gas welding and cutting systems and how these are to be avoided.

Additionally, Service Suppliers are to demonstrate knowledge of the current safety requirements applicable to such equipment by Flag State Administrations.

Where applicable, Service Suppliers involved in the servicing and/or maintenance of gas welding systems are to provide evidence that they have been authorised or licensed to service/maintain the particular make(s) and model(s) of the gas welding system(s) for which approval is sought, by the equipment Manufacturer's. For any gas welding equipment that is not of a general nature (e.g. gas hoses, storage bottles), the Service Suppliers are to provide evidence that they have been authorised or licensed to service/maintain the particular make(s) and model(s) of equipment for which approval is sought, by the equipment Manufacturer's.

### 2.7.3. 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.

The procedures are to include requirements to record the nature and extent of damages and defects found and their acceptable limits in equipment during servicing and repair work. This data is to be made available to the local Lloyd's Register office upon request.

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

### 2.7.4. 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, issued by Lloyd's Register, another full IACS Member or a Flag State Administration who is a signatory to the International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended, showing any conditions that may be appropriate during the servicing and/or maintenance of gas welding and cutting equipment and systems.

### **2.7.5. Equipment and Facilities - General Requirements**

If Service Suppliers undertake shore-based surveying and maintenance, the workshops are to be clean, suitably ventilated and arranged, with due cognisance of the spares and gas welding and cutting media being stored, to ensure the safe and effective working procedures.

Service Suppliers engaged in inspection and testing of equipment onboard are to provide the appropriate facilities to either complete the work onboard or remove the necessary items to their workshops.

### **2.7.6. Equipment**

Sufficient and appropriate spares and tools are to be available for repair, maintenance and servicing of gas welding and cutting equipment and systems in accordance with the requirements of the Manufacturers.

These are to include, as required by the gas welding 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.

## 2.8. Requirements for Service Suppliers Engaged in Inspections and Maintenance of Self-Contained Breathing Apparatus

### 2.8.1. Extent of Engagement

Inspections and maintenance of self-contained breathing apparatus and Emergency Escape Breathing Devices (EEBD), for Statutory purposes.

### 2.8.2. Extent of Approval

Service Suppliers are to have documents and have demonstrated that they have professional knowledge of the equipment sufficient to carry out the inspections and testing of the 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.

### 2.8.3. 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.

### 2.8.4. Reference Documents

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

- Manufacturers servicing manuals, servicing bulletins, instructions and training manuals, as appropriate.
- IMO MSC.1/Circular.1432 – Revised Guidelines for the Maintenance and Inspections of Fire Protection Systems and Appliances.
- Type Approval Certificates, issued by Lloyd's Register, a full IACS Member or a Flag State Administration who is a signatory to the International Convention on the Safety of Life at Sea (SOLAS), 74/78, as amended, showing any conditions which may be appropriate during the servicing and/or maintenance of self-contained breathing apparatus.

### 2.8.5. Equipment and Facilities – General Requirements

If Service Suppliers undertake shore-based inspecting and maintenance, the workshops are to be clean, suitably ventilated and arranged, with due cognisance of the spares and pressurised bottles being stored, to ensure the 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.

### 2.8.6. 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;
- pressure gauges or manometers;
- equipment for checking air quality; and
- recharging facilities for breathing apparatus.

## 2.9. Requirements for Service Suppliers Engaged in Annual Performance Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR)

### 2.9.1. Extent of Engagement

Testing and servicing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR) in accordance with the International Convention on the Safety of Life at Sea (SOLAS), 74/78, Ch. V, Reg. 18.8 and [IMO MSC.1/Circular.1222 – Guidelines on Annual Testing of Voyage Data Recorders \(VDR\) and Simplified Voyage Data Recorders \(S-VDR\)](#), as applicable, for Statutory purposes.

### 2.9.2. Extent of Approval

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

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 – '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 – 'Guidelines on Annual Testing of Voyage Data Recorders \(VDR\) and Simplified Voyage Data Recorders \(S-VDR\)'](#) is applied in its entirety.

### 2.9.3. Procedures

The Service Supplier shall have documented procedures and instructions.

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

#### 2.9.4. 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. V, Reg. 18.8. – Approval, Surveys and Performance Standards of Navigational Systems and Equipment and Voyage Data Recorder.
- [IMO MSC.1/Circular.1222 – Guidelines on Annual Testing of Voyage Data Recorders \(VDR\) and Simplified Voyage Data Recorders \(S-VDR\) \(11 December 2006\)](#).
- [IMO Resolution MSC.333\(90\) – Adoption of Revised Performance Standards for Shipborne Voyage Data Recorders \(VDRs\) \(adopted on 22 May 2012\)](#).
- [IMO Resolution A.861\(20\) – Performance Standards for Shipborne Voyage Data Recorders \(VDRs\) \(adopted on 27 November 1997\)](#), as amended by [IMO Resolution MSC.214\(81\)](#).
- [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 MSC.214\(81\)](#).
- Form 2124 – Installation Record Checklist – Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR).
- Form 2124A – Survey Checklist – Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR).

The Service Supplier is to have access to applicable Industry Performance Standards, e.g.:

- IEC 61996 – Maritime Navigation and Radio Communication 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 Recorder (S-VDR) – Performance Requirements, Method of Testing and Required Test Results.

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

#### 2.9.5. Equipment and Facilities

In addition, the Service Supplier shall have equipment as specified in the authorisation or license from the equipment Manufacturer.

#### 2.9.6. Reporting - Test Report

The Service Supplier shall issue a 'Certificate of Compliance' as specified in the International Convention on the Safety of Life at Sea (SOLAS), 74/78, Ch. V, Reg. 18.8.

The Service Supplier shall issue an 'Installation Record - Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)' (Form 2124) at initial surveys and at any subsequent survey where the details of the installation require to be amended.

The 'Survey Checklist - Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)' is to be completed, signed and stamped by the Service Supplier and attached to the Annual Performance Test Certificate.

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 - 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:

- 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.

The Annual Performance Test Certificate shall be issued to the Owner/Operator within 45 days of completion of the Annual Performance Test.

## 2.10. Requirements for Service Suppliers 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

### 2.10.1. Extent of Engagement

Luminance measurements on board ships of low-location lighting systems using photo luminescent materials, for Statutory purposes.

### 2.10.2. Operators

The operator is to have the following qualifications:

- have adequate knowledge of the applicable International requirements (namely the International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended, Ch. II-2, Pt. D, Reg.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; FSS Code Ch.11); and
- be able to document a theoretical and practical training onboard in using the equipment specified.

### 2.10.3. Procedures

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

### 2.10.4. 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, as amended, 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 \(adopted on 4 November 1993\)](#).
- IMO MSC.1/Circular.1432 – Revised Guidelines for the Maintenance and Inspections of Fire Protection Systems and Appliances.
- ISO 15370:2010 – Ships and Marine Technology – Low-Location Lighting on Passenger Ships – Arrangement.
- [IMO MSC/Circ.1168 – Interim Guidelines for the Testing, Approval and Maintenance of Evacuation Guidance Systems used as an Alternative to Low-Location Lighting Systems](#).

### 2.10.5. Equipment and Facilities

The measuring instrument shall incorporate a fast-response photometer head with CIE (International Commission on Illumination) photopic correction and have a measurement range of at least  $10^{-4}$  cd/m<sup>2</sup> to 10 cd/m<sup>2</sup>.

### 2.10.6. Verification

The Service Supplier must have the attending Surveyor(s) verification of each separate job, documented in the Report by the attending Surveyor(s) signature.

### 2.10.7. Reporting

The Report shall conform to Annex C of ISO 15370-2010.

## 2.11. Requirements for Service Suppliers Engaged in Sound Pressure Level Measurements of Public Address and General Alarm Systems

### 2.11.1. Extent of Engagement

Sound pressure level measurements of public address and general alarm systems on board vessels/installations, for Statutory purposes.

### 2.11.2. Operators

The operator is to have the following qualifications:

- have adequate knowledge of the applicable international requirements (International Convention on Safety of Life at Sea (SOLAS) 74/78, as amended, Ch. III, Reg. 4 and 6; International Life-Saving Appliance (LSA) Code Ch.VII, Reg. 7.2; IMO Code on Alarms and Indicators, 1995, as amended); and
- be able to document a theoretical and practical training onboard in using equipment specified.

### 2.11.3. Procedures

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

### 2.11.4. 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. III, Pt A, Reg. 4 – Evaluation, Testing and Approval of Life-Saving Appliances and Arrangements.
- IMO International Convention on the Safety of Life at Sea (SOLAS), 74/78, Ch. III, Pt B, Reg. 6 – Communications.
- IMO 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.
- IMO Code on Alerts and Indicators, 2009.
- IMO MSC.1/Circular.1432 – Revised Guidelines for the Maintenance and Inspections of Fire Protection Systems and Appliances.
- IEC 60651 (2001-10) – Sound Level Meters.
- IEC 61672 – Electroacoustics – Sound Level Meters.
- IEC 61260 – Electroacoustics – Octave-band and Fractional-octave-band Filters.

### 2.11.5. Equipment and Facilities

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.

#### **2.11.6. Verification**

The Service Supplier must have the attending Surveyor(s) verification of each separate job, documented in the Report by the attending Surveyor(s) signature.

#### **2.11.7. 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 Lloyd's Register.

## 2.12. Requirements for Service Suppliers Engaged in Servicing and Maintenance of Lifeboats and Rescue Boats, Launching Appliances, Release Gear and Davit-launched Liferaft Automatic Release Hooks

### 2.12.1. Extent of Engagement

Servicing and maintenance for Statutory purposes of the following equipment:

- lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats; and
- launching appliances, 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 liferaft automatic release hooks.

### 2.12.2. Extent of Approval

The contents of this procedure apply equally to Manufacturers when they are acting as Service Suppliers.

Any Service Supplier engaged in maintenance, thorough examination, operational testing, repair and overhaul of lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats, launching appliances, on-load and off-load release gear and davit-launched liferaft automatic release hooks carried out in accordance with SOLAS, Ch. III, Reg. 20, should be qualified in these operations for each make and type of equipment for which they provide the service, and provide Manufacturer's documentary evidence that they have been so authorised or they are certified in accordance with an established system for training and authorisation in accordance with [IMO MSC.1/Circ.1277](#) (which is superseded on 1 January 2020 by IMO Resolution MSC.402(96)).

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 authorisation for the equipment and/or long term experience and demonstrated expertise as an authorised service provider.

### 2.12.3. Qualification and Training of Personnel

Service Suppliers should be trained and qualified in the operations for which they are authorised, for each make and type of equipment for which they provide the service.

Such training and qualification should include, as minimum:

- Employment and documentation of personnel certified in accordance with a recognised National, International or Industry Standard as applicable, or an equipment Manufacturer's established certification program. In either case, the certification program should be based on the guidelines in the Appendix to [IMO MSC.1/Circ.1277 – Interim Recommendations on Conditions for Authorisation of Service Providers for Lifeboats, Launching Appliances and On-Load Release Gear](#) (which is superseded on 1 January 2020 by IMO Resolution MSC.402(96) – Requirements for Maintenance, thorough Examination, Operational Testing, Overhaul and Repair of Lifeboats and Rescue Boats, Launching Appliances and Release Gear, Section 8), for each make and type of equipment for which service is to be provided.
- The education and training 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;

- education and practical training in the procedures specified in Annex 1 of [IMO MSC.1/Circ.1206](#) (which is superseded on 1 January 2020 by Section 6 of IMO Resolution MSC.402(96)) for which certification is sought;
  - detailed procedures for thorough examination, operational testing, repair and overhaul of lifeboat (including free-fall lifeboats) rescue boats and fast rescue boats, launching appliances, on-load release gear, as applicable;
  - procedures for issuing a Report of Service and Statement of Fitness for purpose based on [Section 2.12.6](#); and
  - work, health and safety issues while conducting activities on board.
- The education and training for the personnel should 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 should include disassembly, reassembly, correct operation and adjustment of the equipment. Classroom training should be supplemented by field experience in the operations for which certification is sought, under the supervision of an experienced senior certified person.

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

A competency assessment, and refresher training as appropriate on the basis of that assessment, should be conducted to renew the certification.

#### 2.12.4. Reference Documents

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

- IMO International Convention on Safety of Life at Sea (SOLAS), Chapter III, Reg. 20 (as amended by IMO Resolution MSC.404(96) on 1 January 2020).
- [IMO MSC.1/Circ.1206/Rev.1 – Measures to Prevent Accidents with Lifeboats](#), as amended (which is superseded on 1 January 2020 by IMO Resolution MSC.402(96)).
- [IMO MSC.1/Circ.1277 – Interim Recommendation on Conditions for Authorization of Service Providers for Lifeboats, Launching Appliances and On-Load Release Gear](#), as amended (which is superseded on 1 January 2020 by IMO Resolution MSC.402(96)).
- IMO Resolution MSC.402(96) – 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; and [IMO Resolution MSC.81\(70\) – Revised Recommendation on Testing of Life-Saving Appliances](#).
- [IACS Recommendation No.122 – Integral Buoyancy Casings in Lifeboats and Rescue Boats](#).
- For servicing and repair work involving disassembly or adjustment of on-load release mechanisms, availability of the equipment Manufacturer’s specifications and instructions.
- Type Approval Certificates, issued by Lloyd’s Register, another full IACS Member or a Flag State Administration who is a signatory to the International Convention on Safety of Life at Sea (SOLAS) 74/78, as amended, showing any conditions that may be appropriate during the servicing and/or maintenance of lifeboats and rescue boats, launching appliances, on-load release gear and davit-launched liferaft automatic release hooks.
- IMO International Life-Saving Appliance (LSA) Code.

#### 2.12.5. Equipment and Facilities

The Service Supplier is to have access to the following:

- Sufficient tools, and in particular any specialised 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.

#### 2.12.6. Reporting

All Reports and checklists shall be completed and signed by the person who carries out the inspection and maintenance work and countersigned by the Company's representative or the ship's master.

When repairs, thorough examinations and annual servicing are completed, a Statement confirming that the equipment arrangements remain fit for purpose should be promptly issued by the Manufacturer or the Service Supplier that conducted the work. A copy of valid documents of certification and authorisation as appropriate shall be included with the Statement.



## 2.13. Requirements for Service Suppliers Engaged in Surveys of Repairs of Fibre-reinforced Composite Craft

### 2.13.1. Extent of Engagement

Survey of fibre reinforced craft, for Classification and/or Statutory purposes.

### 2.13.2. Extent of Approval

- Approval covers survey of existing vessels, including survey of repairs, under the overall supervision of Lloyd's Register's Surveyor(s).
- Approval does not extend to the execution of repairs or construction of new buildings.
- Where In-Water Surveys (IWS) are conducted, the requirements of this [Part for Service Suppliers Engaged in Carrying out In-Water Survey \(IWS\) of Ships and Mobile Offshore Units](#) should be complied with.

## 2.14. Requirements for Service Suppliers Engaged in Surveys of Repairs to Wooden Vessels

### 2.14.1. Extent of Engagement

Surveys of repairs to wooden vessels, for Classification and/or Statutory purposes.

### 2.14.2. Extent of Approval

- Approval covers survey of existing vessels, including survey of repairs, under the overall supervision of Lloyd's Register's Surveyor(s).
- Approval does not extend to the execution of repairs or construction of new buildings.
- Where In-Water Surveys (IWS) are conducted, the requirements of this [Part for Service Suppliers Engaged in Carrying out In-Water Survey \(IWS\) of Ships and Mobile Offshore Units](#) should be complied with.

## 2.15. Requirements for Service Suppliers Engaged in Visual/Sampling Checks and Testing for Hazardous Materials, such as Asbestos, PCBs, TBTs and CFCs Onboard Ships

### 2.15.1. Extent of Engagement

Visual/sampling checks and testing for hazardous materials onboard ships, including advice on numbers and locations of samples, and preparation of reports on the quantities, locations and estimates of these materials, for Statutory purposes.

### 2.15.2. Extent of Approval

The hazardous materials for which the Service Supplier is approved should be clearly specified.

In order to gain approval for a particular hazard, the Service Supplier should have the ability to obtain the results from a laboratory approved to undertake the relevant 'Sampling and Analysis, Protocols and Test Methods' detailed in [Section 2.15.8](#) below.

Visual and/or sampling checks shall be executed by persons with professional knowledge of hazardous materials licensed as required and, who are trained and equipped experts, in particular with regards to the evaluation and sampling of hazardous materials and materials containing hazardous materials as:

#### Appendix 1

- Asbestos;
- PCB;
- Ozone depleting substances; and
- Anti-fouling systems containing organotin compounds as a biocide.

#### Appendix 2

- Cadmium and Cadmium Compounds;
- Hexavalent Chromium and Hexavalent Chromium Compounds;
- Lead and Lead Compounds;
- Mercury and Mercury Compounds;
- Polybrominated Biphenyl (PBBs);
- Polybrominated Diphenyl Ethers (PBDEs);
- Polychlorinated Naphthalenes (more than 3 chlorine atoms);
- Radioactive Substances; and
- certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro).

### 2.15.3. Certification and Documentation

Service Suppliers and their employees, as relevant, are to hold licenses, as applicable, from the National Authority for the planned activities, as appropriate.

Service Suppliers shall provide evidence of all the necessary training, qualifications, licenses or equivalent thereto and the work and safety procedures for visual/sampling checks and handling the specified hazardous material(s), in accordance with recognised National and International Standards, and any required licenses, and other associated work practices as necessary.

#### **2.15.4. Procedures**

Work shall be executed in accordance with documented work and safety procedures that contain at least the following:

- information on survey preparation;
- safety procedures relevant to the hazards;
- selection and identification of visual and/or sampling check locations;
- material preparation;
- sample removal;
- reinstatement of safe conditions for the material once the sample is taken;
- sample storage, identification and transport requirements; and
- report preparation and content.

#### **2.15.5. Supervision**

The responsible Supervisor shall be qualified, and licensed as required, according to a recognised National or International Industrial Standard, for the hazards specified.

#### **2.15.6. Operators**

The Operators carrying out the visual/sampling check shall be certified, and licensed as required, to a recognised National or International Standard for the hazards specified and shall have professional knowledge of ship structures, equipment, hazardous materials and materials used for ship structures and equipment, sufficient to take and handle such materials, as required.

Note: Not all supervisors or operators are expected to be so qualified for all the hazardous materials which the Service Supplier applies for, but sufficient supervisors and operators must be provided for all hazards applied for.

#### **2.15.7. Equipment and Facilities**

Testing laboratory – details of the laboratory(ies) where samples are to be tested are to be provided. This is to include the recognised National or International Standard, where appropriate, to which each of the hazards is to be assessed. Report preparation, results and contents are required. Such laboratory(ies) is to be accredited or certified in accordance with National or International requirements where applicable.

In order to gain approval for a particular hazard, the laboratory should be accredited or certified to undertake the relevant 'Sampling and Analysis, Protocols and Test Methods' detailed below.

Specific equipment used onboard the ship for the purpose of sampling checks should be duly calibrated and/or certified according to recognised Standards.

## 2.15.8. Sampling and Analysis, Protocols and Test Methods

### Asbestos

**Types to test for:** As per Appendix 9 of [IMO Resolution MEPC.197\(62\)](#); Actinolite CAS 77536-66-4, Amosite (Grunerite) CAS 12172-73-5, Anthophyllite CAS 77536-67-5, Chrysotile CAS 12001-29-5, Crocidolite CAS 12001-28-4, Asbestos Tremolite CAS 77536-68-6.

**Specific testing technique:** Polarised Light Microscopy (PLM), electron microscope techniques and / or X-Ray Diffraction (XRD) as applicable.

**Specific reporting information:** The presence/no presence of asbestos, indicate the concentration range, and state the type when necessary.

#### Notes:

1) The suggested three kinds of testing techniques are the most commonly used methods when analysing asbestos and each of them has its limitation. Laboratories should choose the most suitable methods to determine, and in most cases two or more techniques should be utilised together.

2) The quantification of asbestos is difficult at this stage, although the XRD technique is applicable. Only a few laboratories conduct the quantification rather than the qualification, especially when a precise number is required. Considering the demand from the operators and ship recycling parties, the precise concentration is not strictly required. Thereby, the concentration range is recommended to report, and the recommended range division according to Standard VDI 3866 is, as follows:

- Asbestos not detected.
- Traces of asbestos detected.
- Asbestos content approx. 1% to 15% by mass.
- Asbestos content approx. 15% to 40% by mass.
- Asbestos content greater than 40% by mass.

Results that specified more precisely must be provided with a reasoned statement on the uncertainty.

3) As to the asbestos types, to distinguish all six different types is time consuming and in some cases not feasible by current techniques; while on the practical side the treatment of different types of asbestos is the same. Therefore, it is suggested to report the type when necessary.

### Ozone-depleting substances

**Types to test for:** As per Appendix 8 of [IMO Resolution MEPC.197\(62\)](#); all the listed CFCs, Halons, HCFCs and other listed substance as required by the Montreal Protocol.

**Specific testing technique:** Gas Chromatography-Mass Spectrometry (GC-MS), coupled Electron Capture Detectors (GC-ECD) and Electrolytic Conductivity Detectors (GC-ELCD).

**Specific reporting information:** Type and concentration of ODS.

### Polychlorinated biphenyls (PCB)

Note:

There are 209 different congeners (forms) of PCB – it is impracticable to test for all. Various organisations have developed lists of PCBs to test for as indicators. In this instance, two alternative approaches are recommended. Method 1 identifies the seven congeners used by the

International Council for the Exploration of the Sea (ICES). Method 2 identifies 19 congeners and 7 types of aroclor (PCB mixtures commonly found in solid shipboard materials containing PCBs). Laboratories should be familiar with the requirements and consequences for each of these lists.

**Types to test for:** Method 1: ICES7 congeners (28, 52, 101, 118, 138, 153, 180). Method 2: 19 congeners and 7 types of aroclor, using the US EPA 8082a test.

**Specific testing technique:** GC-MS (congener specific) or GC-ECD or GC-ELCD for applicable mixtures such as aroclors. Note: standard samples must be used for each type.

**Specific reporting information:** PCB congener, ppm per congener in sample, and for Method 2, ppm per aroclor in sample should also be reported.

**Notes:**

1) Certain field or indicator tests are suitable for detecting PCBs in liquids or surfaces. However, there are currently no such tests that can accurately identify PCBs in solid shipboard materials. It is also noted that many of these tests rely on the identification of free chlorine ions and are thus highly susceptible to chlorine contamination and false readings in a marine environment where all surfaces are highly contaminated with chlorine ions from the sea water and atmosphere.

2) Several congeners are tested for as 'indicator' congeners. They are used because their presence often indicates the likelihood of other congeners in greater quantities (many PCBs are mixes, many mixes use a limited number of PCBs in small quantities, therefore the presence of these small quantities indicates the potential for a mix containing far higher quantities of other PCBs).

3) Many reports refer to 'total PCB', which is often a scaled figure to represent likely total PCBs based on the sample and the common ratios of PCB mixes. Where this is done the exact scaling technique must be stated, and is for information only and does not form part of the specific technique.

#### Anti-fouling systems containing organotin compounds as a biocide

**Types to test for:** Anti-fouling compounds and systems regulated under Annex I to the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS Convention), including; Tributyl tins (TBT), Triphenyl tins (TPT) and Tributyl tin oxide (TBTO).

**Specific testing technique:** As per [IMO Resolution MEPC.104\(49\) – Guidelines for Brief Sampling of Anti-Fouling Systems on Ships \(adopted 18 July 2003\)](#), using ICPOES, ICP, AAS, XRF, GC-MS as applicable.

**Specific reporting information:** Type and concentration of organotin compound.

**Note:**

For 'field' or 'indicative' testing it may be acceptable to simply identify presence of tin, due to the expected good documentation on anti-fouling systems.

#### 2.15.9. Reporting

The Report(s) shall be presented to the ship Owner/Manager in the Lloyd's Register format, 'Green Passport Inventory of Hazardous Materials Onboard (LR Green Passport v2.0)' and should include a completed Lloyd's Register 'Visual/Sampling Check Plan', based on [IMO Resolution MEPC. 269\(68\)](#).

## 2.16. Requirements for Service Suppliers Engaged in Shore-Based Maintenance of Satellite EPIRBs

### 2.16.1. Extent of Engagement

Shore-Based maintenance of Satellite EPIRBs for Statutory purposes.

### 2.16.2. Extent of Approval

The principles of this section are applicable to the maintenance of both 406 MHz EPIRBs and L-band EPIRBs, as either type may be carried to comply with the requirements of SOLAS Ch. IV, Reg. 7.1.6. EPIRBs may include 121.5 MHz transmitters, or Global Navigation Satellite System (GNSS) receivers.

The principles of this section also apply to service exchange EPIRBs which should be properly encoded to match the appropriate registration database.

### 2.16.3. Procedures

Service Suppliers are to have a quality control system audited by a competent Authority in respect of its servicing operation.

Procedures and instructions for operating each item of the testing/inspection equipment are also to be kept and be available at all times.

### 2.16.4. Reference Documents

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

- IMO International Convention on Safety of Life at Sea (SOLAS), 74/78, as amended.
- IMO Performance Standards for the equipment for which the Service Supplier is approved.
- Up-to-date technical manuals, service bulletins and the latest software versions as provided by the original equipment Manufacturer.
- [IMO MSC/Circ.1039 – Guidelines for Shore-Based Maintenance of Satellite EPIRBs.](#)
- IMO MSC/Circ.1040/Rev.1 – Guidelines on Annual Testing of 406 MHz Satellite EPIRBs.
- ITU – Radio Regulations.
- Flag State Administration requirements.

### 2.16.5. Equipment and Facilities

A radio-frequency-screened room or enclosure should be available for all maintenance procedures involving, or likely to involve, any transmission from an EPIRB.

A 121.5 MHz monitor receiver should be available; to pick up the homing transmitter and give a warning if the EPIRB is accidentally activated outside the screened enclosure.

Service Suppliers are to have the major and auxiliary equipment required for correctly performing the Shore Based Maintenance. A record of the equipment used is to be kept, containing information on Manufacturer and type of equipment, and a log of maintenance and calibrations.

A tester should be available for checking of correct emission from Free-Float Satellite EPIRBs.

Access should be available to batteries and other spare parts to the original equipment specification.

#### 2.16.6. Reporting

A shore-based maintenance Report should be issued with a list of the test results and maintenance performed.

A Standard that is relevant to the radio equipment to be tested is to be available and is to be cited in the inspection Report.

For equipment employing software in conjunction with testing/examination, such software is to be fully described and verified.

Records of maintenance should be kept, available for inspection by the Administration as may be required.



## 2.17. Requirements for Condition Monitoring Service Suppliers

### 2.17.1. Extent of Engagement

Condition Monitoring activities for Classification purposes.

### 2.17.2. Extent of Approval

The approved Service Supplier may be engaged to carry out Condition Monitoring activities, the direct results of which will be used as part of an approved Condition Monitoring System.

Such services would be such as, but not limited to, data collection, system installation and set-up, calibration of condition monitoring equipment, diagnostics, prognostics and other forms of condition monitoring data acquisition and analysis.

### 2.17.3. Training and Competence

Service Suppliers must be suitably qualified to perform the duties pertinent to the service agreement and as specifically detailed in the approved Condition Monitoring System for which they are contracted.

The training and competence required for condition monitoring services shall be in accordance with an Internationally recognised Standard for each specific Condition Monitoring technology at the required category for each contracted role.

All individuals should be certified by an authorised training Authority, as detailed within the relevant parts of ISO 18436 or equivalent, and that certification should be maintained in date.

### 2.17.4. Equipment and Facilities

All test equipment, data collection devices, tools and devices must be calibrated to the relevant International Standards and be within calibration prior to use.

A record of calibration must be available for inspection at any time.

### 2.17.5. Reporting

Copies of all Reports and any interim diagnostic analysis performed in the activity of service provision must be kept archived securely for a minimum of five (5) years.

The archive must be readily accessible and available for re-issue of Reports at any time.

The scope of all reporting must be clearly stated and any actions advised made clearly evident on each Report.

## 2.18. Requirements for Service Suppliers Engaged in Measurements of Noise Level Onboard Ships

### 2.18.1. Extent of Engagement

Sound pressure level measurements onboard ships.

### 2.18.2. Supervisor

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

### 2.18.3. 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 Ch. II-1, Reg. 3-12, as amended; and IMO Code on Noise Levels Onboard Ships, as amended).
- At least one (1) years' 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.
- The ability to document theoretical and practical training onboard in using a sound level meter.

### 2.18.4. Equipment

#### 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)<sup>1</sup>, as amended, type/class<sup>1</sup> Standard as applicable, or to an equivalent Standard acceptable to the Administration<sup>2</sup>.

<sup>1</sup> Recommendation for sound level meters.

<sup>2</sup> Sound level meters class/type 1 manufactured according to IEC 651/IEC 804 may be used until 1 July 2016.

#### 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)<sup>3</sup>, as amended, or an equivalent Standard acceptable to the Administration.

<sup>3</sup> Octave-band and fractional-octave-band filters.

#### 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.

#### Calibration –

Sound Calibrator and sound level meter shall be verified at least every two (2) 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.

#### 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.

#### 2.18.5. Procedures and Instructions

The Service Supplier shall have documented procedures and instructions to carry out service of the equipment.

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

The Service Supplier shall have access to the following documents:

- IMO SOLAS 1988, as amended, Ch. II-1, Reg. 3-12.
- [IMO Resolution A.468\(XII\)](#) and [IMO Resolution MSC.337\(91\)](#) – Code on Noise Levels on Board Ships.
- [IMO Resolution A.343\(IX\)](#) – Recommendation on Methods of Measuring Noise Levels at Listening Posts.
- Lloyd's Register Rules and Guidelines.

#### 2.18.6. Reporting

A Noise Survey 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 Survey Reports is set out in Appendix 1 of IMO Code on Noise Levels onboard Ships and may conform to any other specific requirement of Lloyd's Register (refer to [IMO Resolution MSC.337\(91\)](#)).

#### 2.18.7. Verification

The Supplier must have the Surveyor's verification of each separate job, documented in the Report by the Surveyor's signature.

## 2.19. Requirements for Service Suppliers Engaged in Tightness Testing of Primary and Secondary Barriers of Gas Carriers with Membrane Cargo Containment Systems for Vessels In-Service

### 2.19.1. Extent of Engagement

Service Suppliers carrying out the following:

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

### 2.19.2. Requirements for Service Suppliers Engaged in Global Testing of Primary and Secondary Barriers

#### Testing procedures

Testing is to be carried out in accordance with cargo containment system designer's procedures as approved by Lloyd's Register.

#### Authorisation

The Supplier is to be authorised by the system designer to carry out the testing.

#### Equipment

Equipment is to be maintained and calibrated in accordance with recognised National or International Industrial Standards.

#### Reporting

The Report is to contain the following:

- date of testing;
- identity of test personnel;
- vacuum decay data for each tank; and
- summary of test results.

### 2.19.3. Requirements for Service Suppliers Engaged in Acoustic Emission (AE) Testing

#### Testing procedures

The Supplier is to have documented procedures based upon recognised National or International Industrial Standards to perform ultrasonic leak test using acoustic emission (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.

#### 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) and have one (1) year experience at Level II.

## Operators

The operators carrying out the acoustic emission (AE) testing shall be certified to a recognised 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.

## Equipment

Equipment is to be maintained and calibrated in accordance with recognised National or International Industrial Standards or equipment Manufacturer's recommendations.

## Evaluation of acoustic emission (AE) testing

Must be carried out by the supervisor or individuals certified to a recognised National or International Industrial Standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) and have one (1) year experience at Level II.

## 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; and
- list and sketch detailing location of possible defects.

### 2.19.4. Requirements for Service Suppliers Engaged in Thermographic Testing

#### Testing Procedures

Testing is to be carried out in accordance with the cargo containment system designer's procedures as approved by Lloyd's Register.

#### Authorisation

The Supplier is to be authorised by the system designer to carry out the testing.

Auditors are to contact [tgg-class](#) prior to commencing any approval process of these Service Suppliers.

#### 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 recognised certification scheme.

#### Operators

The operators carrying out the imaging shall be certified to a recognised 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 recognised certification scheme.

### **Equipment Operators**

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

Equipment is to be in accordance with recognised 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.

### **Evaluation of thermographic images**

Must be carried out by the supervisor or individuals 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 and independent training body centrally certified to ASNT or a comparable nationally recognised certification scheme.

### **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; and
- evaluation of thermal images indicating possible leaks.

## 2.20. Requirements for Service Suppliers Engaged in Installation and Inspection of Cable and Pipe Transits

### 2.20.1. Extent of Engagement

Installation (new and retrofit) and inspection of installations by Service Suppliers of watertight and fire resistant cable and pipe transits/penetrations of their own brand, according to approvals, their own manuals and guidelines, for Classification and/or Statutory purposes.

Inspections carried out by Service Suppliers of new installations or alterations are still required to undergo Lloyd's Register survey.

### 2.20.2. Extent of Approval

Service Suppliers are to be certified to the most current version of the ISO 9000 series.

Approval covers the installation, inspection and repair of watertight and fire resistant cable and pipe transits/penetrations of Service Supplier's own brand, on New Construction and Existing Ships, in accordance with approved plans.

### 2.20.3. Training of Personnel

Service Suppliers are responsible for the qualification and training of their personnel to a recognised National, International or Industry Standard, as applicable. Where such Standards do not exist, Service Suppliers are to define the standards for the training and qualification of their personnel relevant to the functions each is authorised to perform.

The personnel are also to have adequate experience on installation, inspection and repair.

A plan for training and procedures to be qualified against shall be available. Where is not possible to perform internal training, a program of external training may be considered as acceptable.

### 2.20.4. Supervision

Supervisors are to be qualified according to the Service Suppliers' general requirements and are to have minimum two (2) years' experience as a technician/inspector within the activity.

### 2.20.5. Procedures

Service Suppliers are to have documented operational procedures and instructions on how to carry out the inspection of the equipment and installation. These are to either contain or make reference to the Service Supplier servicing manuals, servicing bulletins, instructions and training manuals, as appropriate.

Additionally, they are to make reference to any International requirements.

### 2.20.6. Reference Documents

The Service Supplier shall have access to the following documents:

- Lloyd's Register Rules and Regulations for the Classification of Ships, Pt.5, Ch.12, Sect.5 'Plastic Pipes' and Pt.5, Ch.13, Sect.1 'General requirements'.
- Lloyd's Register Rules and Regulations for the Classification of Ships, Pt. 6, Ch.2, Sect.11 'Electric cables, optical fibre cables and busbar trunking systems (busways)'.

- [IMO Res. MSC.307 \(88\) – International Code for Application of Fire Test Procedures, 2010 \(2010 FTP Code\)](#).
- IMO International Convention on the Safety of Life at Sea (SOLAS) 74/78, as amended.
- [IACS UR P4 – Production and Application of Plastic Pipes on Ships](#).

Service Suppliers are to have access to the service/inspection history of installations.



## PART 3: Summary of New Additions and Amendments (including previous editions)

A – Amended N – New add. D – Deleted	Description	Version
A	Section 2.12 – Requirements for Service Suppliers Engaged in Servicing and Maintenance of Lifeboats and Rescue Boats, Launching Appliances, Release Gear and Davit-launched Liferaft Automatic Release Hooks revised and amended according to IMO Res. MSC.402(96).	V 2.5 – June 2017
A	Section 2.19 – Requirements for Service Suppliers Engaged in Tightness Testing of Primary and Secondary Barriers of Gas Carriers with Membrane Cargo Containment Systems for Vessels In-Service revised and amended according to IACS UR Z17, Rev.12 (Nov 2016).	V 2.5 – June 2017
N	Section added: 2.20. Requirements for Service Suppliers Engaged in Installation and Inspection of Cable and Pipe Transit	V 2.5 – June 2017
A	Format amendments	V 2.4 – January 2017
A	Document updated for Z17 Revs. 10 & 11.	V 2.3 – December 2015
A	Section 2.5 - Requirements for Service Suppliers Engaged in Servicing of Inflatable Liferrafts, Inflatable Lifejackets, Hydrostatic Release Units, Inflatable Rescue Boats Reference to IMO Resolution MSC.388(94) added.	V 2.2 – February 2015
N	Section added: 2.18 - Requirements for Service Suppliers Engaged in Measurements of Noise level Onboard Ships	V 2.1 – December 2014
A	Document reformatted.	V 02 – January 2014



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