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Rules for Classification and Construction

Part 1 Seagoing Ships

RULES FOR APPROVAL OF MANUFACTURERS AND SERVICE SUPPLIERS

Volume XI

July 2025 Edition

Biro Klasifikasi Indonesia

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RULES FOR APPROVAL OF MANUFACTURERS AND SERVICE SUPPLIERS

Volume XI

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Amendments to the preceding Edition are marked by red colour and expanded text.

However, if the changes involves the whole section or sub section normally only the title will be in red colour.

Foreword

This Rules for Approval of Manufacturers and Service Suppliers (Pt.1, Vol.XI) July 2025 edition replace the Rules for Approval of Manufacturers and Service Suppliers (Pt.1, Vol.XI) 2022 edition in conjuction with RCN No.1 2022, RCN No.2 2023, RCN No.3 2024, and Corrigenda No.1 2024. In this edition, new amendments are introduced which are mainly derived from IACS publications, and inputs from BKI Branch Offices and Technical Division BKI Head Office.

The summary of previous edition and amendments including the implementation date are indicated in Table below:

	Edition/ Rule Change Notice (RCN)	Effective Date	Link
1	Corr. No.1, Dec. 2024	-	🔗
2	RCN No.3, May 2024	1st July 2024	🔗
3	RCN No.2, April 2023	1st July 2023	🔗
4	RCN No.1, October 2022	1st January 2023	🔗
5	Consolidated Edition 2022		🔗
6	RCN No.2, Dec. 2021	1st January 2022	🔗
7	RCN No.1, May 2021	1st July 2021	🔗
8	Consolidated Edition 2020	-	🔗

Note: *Full previous edition and amendments including its amendment notice is available through link above.*

This rules is available to be downloaded at www.bki.co.id. Once downloaded, this Rules will be uncontrolled copy. Please check the latest version on the website

Further queries or comments concerning this Rules are welcomed through communication rules@bki.co.id to BKI Head Office.

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Rules Amendment Notice

Table 1 - Amendments incorporated in This Notice

These amendments will come into force on 1st July 2025, except stated otherwise as indicated in the Table.

Paragraph	Title/Subject	Status/Remark
Section 1 – General		
A.	**General**	
A.1.1	-	To harmonize the application of this rules with the classification of offshore structures according to the Rules for Classification and Surveys (Pt.5, Vol.I)
A.2.7	-	To harmonize the definition of 'Service Supplier' with the classification of offshore structures according to the Rules for Classification and Surveys (Pt.5, Vol.I)
Section 3 – Requirements for Approval of Service Suppliers		
A.	**General**	
A.1.1.2	-	To harmonize with the title of the subsection B., C., R. and to delete the exception for conformity accordance with Section 3.B.1
A.1.2	-	To harmonize with the title of the subsection B., C., R. and to delete the exception for conformity accordance with Section 3.B.1
B.	**Firms Engaged in Thickness Measurements on Ships or Floating Offshore Structures**	To add floating offshore structure to the scope of requirements in accordance with Rules for Classification and Surveys (Pt.5, Vol.I)
B.1	Extent of Engagement	Corrigenda for better understanding
C.	**Firms Carrying Out an In-water Survey of Ships and Floating Offshore Structures by Diver or Remotely Operated Vehicle (ROV)**	To supersede the term 'mobile offshore units' with 'floating offshore structures' within the scope of requirements, in accordance with the Rules for Classification and Surveys (Pt.5, Vol.I)
C.1	Extent of Engagement	To supersede the term 'mobile offshore units' with 'floating offshore structures' in accordance with the subsection scope
D.	**Firms Engaged in Inspections and Testing of Radio Communication Equipment**	
D.1	Extent of Engagement	To supersede the term 'mobile offshore units' with 'floating offshore structures' in accordance with the Rules for Classification and Surveys (Pt.5, Vol.I)
D.3.2.4	-	Renumbering
G.	**Firms Engaged in Inspections and Maintenance of Fire Extinguishing Equipment and Systems**	
G.3	Application	Renumbering

Paragraph	Title/Subject	Status/Remark
H.	**Firm Engaged in Services of Inflatable Liferafts, Inflatable Lifejackets, Hydrostatic Release Units, Inflatable Rescue Boats, Marine Evacuation Systems**	
H.2	Application	Renumbering
J.	**Firms Engaged in Testing of Coating Systems in Accordance with IMO Resolution MSC.215(82) as Amended and IACS UI SC223 and/or MSC.288(87) as Amended**	
J.6	Reporting	Corrigenda updating the reference to the Guidance for Marine Industry (Pt.1, Vol.AC)
M.	**Firms Engaged in Examination of RO-RO Ships Bow, Stern, Side and Inner Doors**	
M.3	Operators and Supervisors	Renumbering and corrigenda
P.	**Firms Engaged in Measurements of Noise Level Onboard Ships**	
P.4.	**Equipment**	
P.4.3	Sound Calibrator	To add a reference for calibration standard in accordance with IACS UR Z17 Rev.21 *This amendments are applied to ship constructed on or after 1 July 2026*
R.	**Firms Engaged in Survey Using Remote Inspection Techniques (RIT) as an Alternative Means for Close-up Survey of the Structure of Ships and Floating Offshore Structures**	To supersede the term 'mobile offshore units' with 'floating offshore structures' within the scope of requirements, in accordance with the Rules for Classification and Surveys (Pt.5, Vol.I)
R.1.2	Remote Inspection Techniques (RIT)	Corrigenda updating the reference to the Guidance for Marine Industry (Pt.1, Vol.AC)
R.2.1	-	To supersede the term 'mobile offshore units' with 'floating offshore structures' in accordance with the subsection scope
R.2.2	-	To supersede the term 'mobile offshore units' with 'floating offshore structures' in accordance with subsection C.
T.	**Firms Engaged in Watertight Cable Transit Seal Systems Inspection on Ships and Floating Offshore Structures**	To supersede the term 'mobile offshore units' with 'floating offshore structures' within the scope of requirements, in accordance with the Rules for Classification and Surveys (Pt.5, Vol.I)
U.	**Firms Engaged in Preparation and Maintenance of Inventory of Hazardous Materials (IHM)**	To broaden the scope of the supplier regarding scope of Inventory of Hazardous Materials (IHM).
U.1	Extent of Engagement	to define three services of the firm regarding IHM)
U.2	Extent of Approval	To extend the scope of IHM service supplier
U.3	Operators and Supervisors	To add the minimum number of supervisor and operator and corrigenda the references
U.4	Procedures and Instructions	To clearly define the documentation requirements for service suppliers involved in the development of IHM
U.6.2	-	Corrigenda for better understanding

Paragraph	Title/Subject	Status/Remark
V.	**Firms Engaged in Commissioning Testing of Ballast Water Management Systems(BWMS)**	
V.4.	**Operators and Supervisors**	
V.4.1	**Training**	
V.4.1.3	-	To add a reference document for knowledge learning in accordance with IACS UR Z17 Rev.19 *This amendments are applied to ship constructed on or after 1 January 2026*

Table of Contents

Section 1 General

A. General

1. General

1.1 The Rules for Approval of Manufacturers and Service Suppliers (here in after referred to as the "Rules") applies to assessment and approval of a manufacturing works of ships and floating offshore structure, to be classed or have been classed, and of machinery, materials, etc. with which the ships are to be equipped (here in after referred to as the "products"), and also applies to a service supplier of a repairing service, a maintaining service, an inspecting service, a measuring service or the survey, etc. to the products.

1.2 Assessment and approval under the Rules are performed to confirm that a manufacturing works or a service supplier has enough capacity as follows:

1.2.1 For a manufacturing works of products, it has enough capability to maintain such quality of its products as required by Rules for the Classification and Construction of Seagoing Ships, and other rules of BKI.

1.2.2 For a service supplier, it has enough capability to evaluate that the products have such quality as required by Rules for the Classification and Construction of Seagoing Ships, and other rules of BKI.

1.3 Assessment and approval under the Rules apply to a manufacturing works for the specified products or a service supplier for the specified services

1.4 Assessment and approval are made following an application from a manufacturer's or supplier's management.

1.5 In the case of manufacturing works with several production facilities which have separate organization and are in separate location, approval will generally be granted for the plant that manufactured the product.

2. Definition of Terms

2.1 "Quality system" means a system under management in which the organizational structure, responsibilities, procedures, processes, personnel, etc. that a manufacturing works or a service supplier possesses are combined in an organic manner for the product or the service.

2.2 "Quality manual" means a document of procedures to perform and maintain a quality system.

2.3 "Manufacturer's or supplier's management" means a top management related to a quality system in a manufacturing works or a service supplier.

2.4 "Internal quality audit" means systematic and independent examination the manufacturer's management performs to verify that the established quality system is operating effectively and as planned, and to determine the adequacy of that system to achieve the objectives

2.5 "Rules of BKI" means technical rules of BKI such as "Rules for the Classification and Construction of Seagoing Ships", and other rules considered to be equivalent.

2.6 "Manufacturer" means:

1) In Section 2, a company that manufactures materials and equipment for marine use.

2) In Section 3, a company that manufactures equipment required to be periodically serviced and/or maintained.

2.7 "Service Supplier" (a Service Supplier or category of Service Supplier may be referred to here after simply as 'supplier') means a person or company, not employed by BKI or other classification society who at the request of an equipment manufacturer, shipyard, vessel's owner or other client acts in connection with survey inspection work and provides services for a ship or floating offshore structure 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.

2.8 "Subcontractor" means a person or company providing services to a manufacturer or approved/recognized service supplier, with a formal contract defining the assumption of the obligations of the manufacturer or service supplier.

2.9 "Agent" means a person or company authorized to act for or to represent a manufacturer or approved/recognized service supplier.

2.10 "Subsidiary" means Company partly or wholly owned by a manufacturer or approved/recognized service supplier.

B. Miscellaneous

1. Fees

The fees and the travel expenses are charged in accordance with the separate provisions in case where performing the assessment or the surveillance. Fees for all services rendered by BKI are due for payment immediately upon receipt of the invoice but not later than 28 (twenty eight) calendar days. On default BKI entitled to withhold next assessment, certificate and others documents.

2. Liability

BKI will use their best endeavours to ensure that their Surveyors and all other personnel employed for the proper execution of the functions of BKI will be selected carefully.

BKI will be liable for loss or damage of product, if it proved that the loss resulted directly from an act or omission of the BKI done. The liability of BKI shall be limited in its amount up to maximum of the fee for that particular service.

Rights to Claims of the client for defects as to quality shall become time barred 3 (three) months after acceptance by the client of the performance by BKI of its obligation.

Section 2 Requirements for Approval of Manufacturers

The requirements for approval of manufacturers, see Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use (Pt. 1, Vol. W).

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Section 3 Requirements for Approval of Service Suppliers

A. General

1. Application

1.1 This Section applies to the approval of the following categories of service suppliers listed as follows:

(IACS UR Z17 4.1)

1.1.1 Statutory services:

1) Firms engaged in servicing inflatable liferafts, inflatable lifejackets, hydrostatic release units, marine evacuation systems

2) Firms engaged in servicing and testing of radio communication equipment on ships

3) Firms engaged in inspections and maintenance of self contained breathing apparatus

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

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

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

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

8) Firms engaged in inspection, performance testing and maintenance of Automatic Identification Systems (AIS)

9) Firms engaged in Commissioning Testing of Ballast Water Management System (BWMS)

(IACS UR Z17 4.1.1)

1.1.2 Classification and/or Statutory services:

1) Firms engaged in thickness measurements on ships or floating offshore structures

2) Firms carrying out in-water survey of ships and floating offshore structure by diver or Remotely Operated Vehicle (ROV).

3) Firms engaged in inspections and maintenance of fire extinguishing equipment and systems.

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

5) Firms engaged in measurements of noise level on board ships

6) Firms engaged in examination of RO-RO ship's bow, stern, side and inner doors

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

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

9) Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Closeup Survey of the structure of ships and floating offshore structure

10) Firms engaged in Non-Destructive Testing (NDT)

1.2 Where the results of the following service providers are used by a BKI's Surveyor in making decisions affecting classification services then that service provider shall be approved and verified by BKI.

1) Firms engaged in thickness measurements on ships or floating offshore structure
2) Firms carrying out in-water survey of ships and floating offshore structure by diver or Remotely Operated Vehicle (ROV).
3) Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment
4) Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and floating offshore structure.
5) Firms engaged in Non-Destructive Testing (NDT)

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

— the flag Administration itself,
— duly authorized organizations acting on behalf of the flag Administration, or
— other organizations those are acceptable to the flag Administration (e.g. other governments, etc.).

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

— Firms engaged in inspections of low location lighting systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems
— Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships
— Firms engaged in measurements of noise level onboard ships
— Firms engaged in testing of coating systems in accordance with IMO Resolution MSC.215(82) as amended and IACS UI SC223 and/or MSC.288(87) as amended
— Firms engaged in examination of RO-RO ships bow, stern, side and inner doors

1.5 Detailed requirements specific to the various categories of suppliers are given in the following Sub-section. National and/or international requirements as well as requirements stipulated by flag Administration may give additional requirements. References to such national and/or international requirements are given in the following sub-section.

2. General Requirements

2.1 Extent of Approval

The supplier shall demonstrate, as required by 2.2 to 2.11, that it has the competence and control needed to perform the services for which approval is sought.

2.2 Training of personnel

2.2.1 The supplier is responsible for the qualification and training of its personnel to a recognised national, international or industry standard as applicable.

2.2.2 Where such standards do not exist, the supplier is to define standards for the training and qualification of its personnel relevant to the functions each is authorised to perform.

2.2.3 The personnel shall also have adequate experience and be familiar with the operation of any necessary equipment.

2.2.4 Operators/technicians/inspectors shall have had a minimum of one year tutored on-the-job training. Where it is not possible to perform internal training, a program of external training may be considered as acceptable.

2.2.5 The supplier's management is to establish and maintain a documented procedure for training of all personnel who are engaged in the activities which can affect quality of the relevant services.

2.3 Supervision

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

2.4 Personnel records

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

2.5 Equipment and facilities

2.5.1 The supplier shall have the necessary equipment and facilities for the service to be supplied.

2.5.2 A record of the equipment used shall be kept and available. The record shall contain information on maintenance and results of calibration and verifications. BKI shall assess and record the validity of previous measuring results when the equipment is found not to conform to requirements. BKI shall take appropriate action on the equipment affected.

2.5.3 The supplier's management is to establish and maintain a documented procedure to control, calibrate and maintain the equipment specified in 2.5.1 and 2.5.2.

2.6 Control of data

2.6.1 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.

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

2.7 Service Station

Where several servicing stations are owned by a given company, each station is to be assessed and approved except the companies have implemented a quality system certified in accordance with the most current version of ISO 9000 series as specified in 3.3.

(IACS UR Z17 5.2.7)

2.8 Procedures

2.8.1 The supplier's management is to establish and maintain a documented work procedure for the services to be provided.

(IACS UR Z17 5.2.8)

2.8.2 The documented work procedure is to contain information given in the following sub section.

2.9 Subcontractors

2.9.1 The supplier shall give information of agreements and arrangements if any parts of the services provided are subcontracted. Particular emphasis shall be given to quality management by the supplier in following-up such subcontracts. Subcontractors providing the services of the approved service supplier shall also meet the requirements of A.

(IACS UR Z17 5.2.9)

2.9.2 Ordering documents are to contain data clearly necessary for the subcontracting.

2.9.3 The supplier's management is to establish and maintain a documented procedure for implementing the subcontracting control specified in 2.9.1 and the order specified in 2.9.2.

2.10 Verification

2.10.1 The supplier's management is to verify quality of the services provided to ensure compliance with approved procedures.

(IACS UR Z17 5.2.10)

2.10.2 The supplier's management is to perform the internal quality audits periodically. As to the results of the audits, the following items are to be ensured.

- The audit results are to be reported to the supplier's management and the sections audited.
- Based on the audit results, the supplier's management is to review the quality system when necessary.
- The audit results and the records of the management review are all to be maintained.

2.10.3 The supplier's management is to establish and maintain a documented procedure for implementing the verification specified in 2.10.1 and the internal quality audit specified in 2.10.2.

2.11 Reporting

2.11.1 The supplier's management is to establish and maintain a documented procedure for recording and reporting the results of the services.

2.11.2 The report shall be prepared in a form acceptable to BKI. The report should detail the results of inspections, measurements, tests, maintenance and/or repairs carried out. Special guidelines may be given in the following sub section. The report shall include a copy of the Certificate of Approval.

2.12 Documentation

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

3. Quality System

3.1 To maintain quality required to the services to be provided, the supplier's management is to establish and maintain a documented quality system that is in conformity with the requirements in 1) through 8).

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

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

3.3 If a manufacturer of equipment (and/or its service supplier) applies to BKI for inclusion of its nominated agents and/or subsidiaries (excluding any subcontractor) in the approval, then it must have implemented a quality system certified in accordance with the most current version of ISO 9000 series. The quality system must contain effective controls of the manufacturer's (and/or service supplier's) agents and/or subsidiaries. The nominated agents/subsidiaries must also have in place an equally effective quality system complying with the most current version of ISO 9000 series. Such approvals shall be based upon an evaluation of the quality system implemented by the parent company against the most current version of ISO 9000 series. BKI may require follow-up audits on such agents or subsidiaries against the most current version of ISO 9000 series to confirm adherence to this quality system.

4. Service Suppliers Relations with the Equipment Manufacturer

A company which works as a service station for manufacturer(s) of equipment (and as a service supplier in this field), shall be assessed by the manufacturer(s) and nominated as their agent. The manufacturer shall ensure that appropriate instruction manuals, material etc. are available for the agent as well as proper training of the agent's technicians. Such suppliers shall be approved either on a case by case basis, or in accordance with 3.3.

5. Procedure for Approval and Certification

5.1 General

5.1.1 In case a service supplier intends to obtain or maintain approval as a service supplier under the Rules, the service supplier is to be assessed by BKI in accordance with the requirements of this Section.

5.1.2 In such assessment of a service supplier, an investigation on the quality system, service procedures, service facilities, operators, etc. and, a demonstration where necessary, are carried out and comprehensive evaluation is made.

5.2 Initial assesment

In initial assessment, a service supplier to be assessed by BKI, based upon the results of document examination and field examination as specified for in the following:

5.2.1 Document examination

.1 Service suppliers intended to be approved under these Rules are to submit the following documents in form of soft copy (electronic version) to BKI for the document examination.

1) Outline of the firms intended to be approved (e.g. location, history, organization and management structure, including subsidiaries to be included in the approval/certification, number of employees, main services and their actual records, etc.)
2) List of nominated agents, subsidiaries and subcontractors
3) Experience of the company in the specific service area
4) For categories of Service Suppliers that require certification from manufacturers, the manufacturer's documentary evidence that the Service Supplier has been certified or licensed to service the particular makes and models of equipment for which approval is sought shall be provided.
5) List of operators/technicians/inspectors documenting name, training and experience within the relevant service area, qualifications according to recognised national, international or industry standards, as relevant,
6) Training programmes for operators/technicians/inspectors
7) Description of equipment used for the particular service for which approval is sought (measuring equipment, outline of workshops and facilities for storing materials and parts, a list of orders to the subcontractors, etc.)
8) A guide for operators of such equipment
9) Quality manual and its supplementary documents, or documented procedures (work procedures, verification procedures, recording and reporting procedures, training procedures, control procedures of measuring equipment, etc.)
10) 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.
11) Checklists of the relevant services and reporting formats to BKI
12) Copies of approval certificates issued by competent organizations or other classification societies, if any.
13) Information on the other activities which may present a conflict of interest.
14) Record of customer claims and of corrective actions requested by certification bodies
15) Operators/technicians/inspectors documentation that they have acknowledged the code of conduct
16) Other documents deemed necessary by the BKI.

(IACS UR Z17 5.1.1)

.2 In the document examination, the documents submitted under the requirement in .1 above are reviewed to confirm that the documented quality system is in conformity with the Rules.

5.2.2 Field audit

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

(IACS UR Z17 5.3)

.2 Demonstrations of the service performances intended to be approved are to be carried out with satisfactory reporting. At initial assesment, when the supplier has been approved by other classification societies according to IACS UR Z17, this may be verified through documentary review that a practical demonstration has already been carried out. At renewal assesment, verification by documentary review of jobs undertaken since the previous assesment and that have been accepted by BKI is acceptable and is sufficient to satisfy this requirement.

(IACS UR Z17 5.4)

5.3 Renewal Assessment

5.3.1 Renewal assessment is to be carried out to the approved service supplier by the expiry date of the approval certificate as specified in 5.6, in case where the supplier's management intends renewal of the approval.

5.3.2 In the renewal assessment, assessment is made in accordance with the requirements for the initial assessment specified in 5.2 above. However, if BKI considers acceptable, evidence of performance, verified by surveyor, since the previous audit is sufficient to satisfy this requirement.

(IACS UR Z17 5.4)

5.3.3 Where for operational reasons, the renewal assessment falls outside the period of approval, the service supplier will still be considered as approved if agreement to this assessment date is made within the original period of approval, in this instance if successful, the extension of approval will be back dated to the original renewal date.

5.4 Occasional Assessment

5.4.1 Occasional assessment is carried out to the approved service supplier as the occasion demands if any of the following conditions happen:

1) In case the supplier's management intends to make alternations and some change in the approved contents at a time other than that of renewal assessment.

2) In case where non-conformities in the approved quality system are found, or In case where a result of the services is in doubt.

5.4.2 In the occasional assessment, it is confirmed by BKI that all the necessary items are in a satisfactory condition.

5.4.3 When amendment of the certificate is necessary during occasional assessment, the validity period of new certificate will be dated as previous certificate.

5.5 Preparations for Assessment, and Others

5.5.1 All such preparations as required for assessment specified in 5.2 through 5.4 are to be made by the service suppliers. On such occasions, the management representative or the person familiar with the quality system is also to be present at the assessment.

5.5.2 In case necessary preparations have not been made or in case no responsible person specified in 5.6.1 above is present at the assessment, BKI may suspend the assessment.

5.5.3 As a result of assessment, in case rectification is considered necessary, BKI will notify the management accordingly. The supplier's management who has received such notification is to perform corrective actions subject to confirmation by BKI.

5.6 Issuance of approval certificates and official announcement

5.6.1 Upon satisfactory completion of both the audit of the supplier and the demonstration test, as applicable, BKI will issue a Certificate of Approval stating that the supplier's service operation system has been found to be satisfactory and that the results of services performed in accordance with that system may be accepted and utilised by BKI's Surveyors in making decisions affecting classification or statutory certification, as relevant. The valid term of an approval certificate is 3 years from the date of the initial or the renewal approval.

(IACS UR Z17 6.1)

5.6.2 The certificate shall clearly state the type and scope of services and any limitations or restrictions imposed including type of equipment and/or names of Manufacturers of equipment where this is a limiting restraint.

(IACS UR Z17 6.1)

5.6.3 The approved supplier will be included in BKI's list of the approved service suppliers.

5.7 Issuance of assessment record

As a result of the assessment, an assessment record stating corrective action requests on the quality system, etc. is issued to the service supplier.

5.8 Renewal of Approval Certificates

5.8.1 Renewal of the certificate is to be made at intervals not exceeding 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, the BKI is to be informed in due course by the Service Supplier.

(IACS UR Z17 6.2)

5.8.2 In case where the renewal assessment is carried out within 3 months before the expiry date, the valid term of the approval certificate will be dated to the original renewal date.

5.9 Cancellation of Approval

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

(IACS UR Z17 8.1)

5.9.2 In case an approved service supplier falls under one of the following items 1) through 7), BKI may cancel the approval, upon such a cancellation BKI notifies the supplier's management accordingly.

1) Where the service was improperly carried out or the results were improperly reported.
2) Where a Surveyor finds deficiencies in the approval service operating system of the supplier and appropriate corrective action is not taken.
3) Where alterations have been made to the Company's Quality System relevant to the service supplier certificates, without written notification to BKI.
4) Where wilful acts or omissions are ascertained.
5) Where any deliberate misrepresentation has been made by the Service Supplier
6) In case assessment specified for in 5.3 and 5.4 is not carried out.
7) In case the supplier's management proposes to cancel application to the Rules.

(IACS UR Z17 8.2)

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

(IACS UR Z17 8.3)

5.9.4 Expiration or cancellation of the Supplier's parent company approval automatically invalidates approval of all agents and subsidiaries if these are certified according to 3.3

(IACS UR Z17 3.3)

5.10 Information Regarding Alterations to the Certified Service Operating System

When any alteration to the certified service operating system of the supplier is made, such alteration is to be immediately informed to BKI. Re-audit may be required when deemed necessary by BKI.

(IACS UR Z17 7.1)

B. Firms Engaged in Thickness Measurements on Ships and Floating Offshore Structures

1. Extent of Engagement

Firms engaged in thickness measurement of structural material of ships and floating offshore structures consist of:

1) Category I:
   A) all types and sizes of ships (ESP and non-ESP) and offshore structures;
   B) all types and sizes of non-ESP ships and offshore structures.
2) Category II: fishing vessels of all sizes and non-ESP ships of less than 500 GT.

2. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 5).

1) Inspection preparation
2) Selection and identification of test locations
3) Surface preparation and protective coating preservation
4) Calibration checks
5) Report preparation and content

3. Operators and Supervisors

3.1 Training

Operators carrying out thickness measurements and supervisors are to have sufficient knowledge as to following 1) through 5). A documented training procedure required in A.2.2 is at least to contain information on them.

1) Outline of hull structures and structural members.
2) Mid-ship sections of typical ship type.
3) Typical damages and positions where corrosions are liable to occur, of typical ship types.

4) Outline of BKI's Petunjuk Pelaksanaan Standar Pengukuran Ketebalan Konstruksi Lambung (Pt.1 Vol.X).

5) Procedure for carrying out thickness measurement as specified in Rules for Classification and Surveys (Pt.1 Vol.I), Sec. 3, D.

3.2 Qualification

3.2.1 The responsible supervisor shall be qualified according to a recognised national or international industrial NDT standard (e.g. EN 473 level II as amended or ISO 9712 level II as amended). This qualification requirement does not apply to category II companies.

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

3.2.3 Personnel (supervisors and operators) qualification to an employer-based qualification scheme as SNT-TC-1A may be accepted if the employer's written practice is reviewed and found acceptable by BKI.

4. Thickness Measuring Equipment

4.1 In general, ultrasonic gauging equipment to be used for thickness measurements.

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

5. Reporting

5.1 Category I companies

The UTM report shall be based on the guidelines given in UR Z7, UR Z7.1, UR Z7.2, Z10.1, Z10.2, Z10.3, Z10.4 and Z10.5, as relevant (see Rules for Classification and Surveys (Pt.1 Vol.I), Annex B.13). The report shall be made in BKI's electronic reporting format. The report shall include a copy of the certificate of approval of the firm.

Final reporting in original electronic form and in a non-editable electronic form (e.g. PDF-format) shall be presented to Surveyor within two (2) weeks after the job is terminated.

5.2 Category II companies

The operator shall report in a recognized system and may illustrate the result by sketches or on the drawings. In addition to the measured values, the original scantlings, the minimum thickness and the substantial corrosion limits, shall be included in the report.

Final reporting shall be presented to Surveyor within two (2) weeks after the job is terminated.

The report shall include a copy of the certificate of approval, containing the names of all approved operators.

6. Verification

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

7. Demonstration

7.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, practical demonstration on actual ships shall be carried out at the presence of BKI's Surveyor to verify that the supplier provides thickness measurements specified in the documents submitted. For category I.A companies the ship used for the demonstration shall be a ship with ESP notation and for category I.B companies use a non-ESP ship. For category II companies the demonstration may be dispensed with.

7.2 Structural members to be measured are directed by BKI's surveyor at the demonstration in order to ascertain that the operators and the supervisors have sufficient knowledge about the structural members. The surveyor may ask some questions in damages of typical ships to ascertain that the operators and supervisors have sufficient knowledge about the damage.

C. Firms Carrying Out an In-water Survey of Ships and Floating Offshore Structures by Diver or Remotely Operated Vehicle (ROV)

1. Extent of Engagement

In-water survey in lieu of a docking survey and/or the internal hull survey of compartments filled with water on ships and floating offshore structures by diver or Remote Remotely Operated Vehicle (ROV).

2. Work Procedure

2.1 A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 5).

1) Inspection preparation.
2) Guidance of the diver along the hull to provide complete coverage of the parts to be inspected.
3) Two-way communication between divers and BKI's surveyor.
4) Video recording and closed circuit television operation.
5) Reporting inspection result.

2.2 In addition to above 2.1, documented operational procedures and guidelines for firms carrying out in-water survey by ROV shall also include:

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

3. Divers and Supervisors

The supplier is responsible for the qualification of its divers, Remotely Operated Vehicle (ROV) operators and supervisors and for their training in the use of the diving equipment utilised when carrying out inspection.

3.1 Training

3.1.1 Divers, Remotely Operated Vehicle (ROV) operators and supervisors carrying out In-Water survey are to have sufficient knowledge as to following 1) through 7). A documented training procedure required in A.2.2 is at least to contain information on them.

1) Ship's underwater structure and appendages (including propeller shaft, propeller, rudder and its bearings, etc.).
2) Ship's terminology in English.

3) Non-destructive testing in accordance with a recognised national or international industrial NDT standard. This requirement only applies if an in-water survey company performs non-destructive testing.

4) Bearing clearance measurements on rudders and propeller shafts.

5) Underwater video monitoring with TV monitor on deck as well as still picture work.

6) Operation of underwater communication system.

7) Any special equipment necessary for the work carried out.

3.1.2 In addition to 3.1.1, the following plan shall be included in the training of personnel:

1) tThe reporting system,

2) minimum Rule requirements for relevant ship or unit types,

3) ship's or unit's underwater structure,

4) measuring of bearing clearances,

5) the recognition of corrosion damage, buckling and deteriorated coatings, etc.

3.2 Qualification

3.2.1 Divers and Operators

1) Divers carrying out inspection

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

2) ROV operators

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

3.2.2 Supervisor

1) Diving Supervisor

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

2) ROV Supervisor

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

3.2.3 Certification as a thickness measurement firm when conducting thickness measurements under water.

4. Equipment Used for In-water Survey

4.1 The supplier is to have equipment listed in the following 1) through 6).

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

4.2 In addition to above 4.1, the following shall be available for firms carrying out survey by ROV:

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

5. Verification

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

6. Demonstration

6.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, practical demonstration to the actual ship shall be carried out at the presence of BKI's Surveyor to verify that the supplier provides In-Water survey specified in the documents submitted.

6.2 Where other means e.g. video tapes, which enable BKI to verify the In-Water survey operation of the supplier in lieu of the demonstration, are available, the demonstration may be dispensed with.

D. Firms Engaged in Inspections and Testing of Radio Communication Equipment

1. Extent of Engagement

1.1 Surveys, inspection, testing, and/or measurement of radio equipment aboard ships or floating offshore structures for compliance with SOLAS regulations.

1.2 Annual testing of 406 MHz satellite EPIRBs for compliance with SOLAS Regulation IV/15.9.

1.3 The principles of this sub-section also apply to Service Suppliers involved in inspection, performance testing and maintenance of Automatic Identification Systems (AIS). The Service Supplier is to be familiar with the equipment with which it will be involved, such as being a service agent for the equipment manufacturer.

2. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 3).

1) Preparation of radio inspections
2) Carrying out radio inspections
3) Report preparation and content

3. Radio Inspectors and Supervisors

3.1 Training

3.1.1 Radio inspectors carrying out inspections of radio installations and supervisors are to have sufficient knowledge as to following 1) through 11).

1) Radiotelephony
2) Global Maritime Distress and Safety System (GMDSS)
3) SOLAS 1974 as amended
4) IMO Res. MSC.349(92): Code for Recognized Organizations (RO Code)
5) MSC/Circ.1040/Rev.1 – Guidelines on Annual Testing of 406 MHZ Satellite EPIRBs
6) MSC.1/Circ.1252 – Guidelines on Annual Testing of the Automatic Identification System (AIS)
7) SN/Circ.227, SN/Circ.227/Corr.1 and 245 – Guidelines for the Installation of a Shipborne Automatic Identification System (AIS) and amendments thereto
8) ITU Radio Regulations
9) IMO Performance Standards for the equipment for which the Service Supplier is approved
10) Flag State Administration requirements
11) Relevant parts, if any, of BKI's Rules and Guidelines

3.1.2 A documented training procedure required in A.2.2 is at least to contain information on items listed in 3.1.1. And the supplier is to provide latest reference documents.

3.1.3 In accordance with the procedure specified in 3.1.2, inspection instructions issued by BKI are to be furnished to radio inspectors without fail.

3.2 Qualification

3.2.1 Radio inspectors carrying out inspections of radio installations are to satisfy the requirements in the following 1) through 5), with regard to competence and experience:

1) shall have passed the internal training of the supplier in Radiotelephony, GMDSS, and initial and renewal surveys, as applicable;
2) shall also have at least one year's technical school training or as alternative hold evidence that he followed a technical course approved by the relevant Administration;
3) shall have at least one year's experience as an assistant radio inspector;
4) should preferably hold an appropriate National Radio Operators Certificate, recognised by the ITU, such as a GMDSS General Operator's Certificate (GOC) or a GMDSS Radio electronic Certificate (REC);
5) should be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure.

3.2.2 Supervisors for inspections of radio installations are to satisfy the requirements in the following 1) through 5).

1) To have had minimum 2 years education from a technical school relevant to radio.
2) To have, as far as practicable, a certificate recognized by an organization approved by the Government of a state.
3) To have had experiences as a radio inspector.
4) Should preferably hold a General Operator's Certificate (GOC) or a GMDSS Radio electronic Certificate (REC), recognised by the ITU, to operate or test radio transmitters.
5) Should be aware of any local conditions for radio signal propagation, of regional radio stations and their facilities, and of the GMDSS infrastructure.

3.2.3 Notwithstanding the requirements in 3.2.1 and 3.2.2, BKI may appoint a person, who is deemed to have competence and experience equivalent to those specified in 3.2.1 or 3.2.2, as a radio inspector of radio installations or a supervisor.

3.2.4 In general, radio inspectors and supervisors listed in the following are to be attached to the supplier.

1) One or more radio inspectors
2) One or more supervisors

4. Equipment Used for Radio Inspections

4.1 The supplier shall have the major and auxiliary equipment required for correctly performing the inspection. A record of the equipment used shall be kept. The record shall contain information on manufacturer and type of equipment, and a log of maintenance and calibrations.

4.2 A standard which is relevant to the radio equipment to be tested shall be available for the equipment and shall be cited in the inspection report.

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

4.4 The supplier is to have equipment listed in the following 1) through 5):

1) Equipment for measuring frequency, voltage, current and resistance
2) Equipment for measuring output, reflect effect and modulation on Very High Frequency (VHF) and Medium Frequency / High Frequency (MF/HF)
3) Synchroscope
4) Acid tester for checking specific gravity of lead batteries
5) Tester for checking of correct output from free-float satellite Emergency Position Indicator Radio Beacon (EPIRB).

5. Demonstration

5.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out at the presence of BKI's Surveyor to verify that the supplier provides radio inspections specified in the documents submitted.

E. Firms Engaged in Annual Performance Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR)

1. Extent of Engagement

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

(IACS UR Z17 Annex 1 9.1)

2. Extent of Approval

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

(IACS UR Z17 Annex 1 9.2.1)

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

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

(IACS UR Z17 Annex 1 9.2.2)

3. Work Procedure

3.1 A documentedwork procedure specified in A.2.8 is at least to contain information on items listed in the following 1) through 4).

(IACS UR Z17 Annex 1 9.3.1)

1) Preparation of performance tests of VDR or S-VDR
2) Implementation of performance tests of VDR or S-VDR
3) Reporting the results of performance tests of VDR or S-VDR
4) Issue of annual performance test certificate

3.2 Where the Service Supplier is also the Manufacturer of the Voyage Data Recorder (VDR) or Simplified Voyage Data Recorder (S-VDR) and has selected to apply IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (SVDR) 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 (by any available means, e.g. via a nominated contact point or from the Manufacturer's website) upon request.

(IACS UR Z17 Annex 1 9.3.2)

4. Education and Training

4.1 The Service Suppliers responsible for the carrying out of performance tests on VDR and S-VDR are to maintain those up-to-date versions of the books and documents referred to in the following 1) through 8).

1) 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.
2) IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (S-VDR).
3) IMO - Resolution A.861(20) (adopted on 27 November 1997) as amended by IMO Resolution MSC.214(81) and revised by IMO Resolution MSC.333(90) – Performance Standards for Ship borne Voyage Data Recorders (VDRs).
4) IMO - Resolution MSC.163 (78) - Performance Standards for Ship borne Simplified Voyage Data Recorders (S-VDRs) - (adopted on 17 May 2004), as amended by IMO Resolution 214(81).
5) IEC 61996 - Maritime navigation and radio communication equipment and systems – Ship borne voyage data recorder (VDR).
6) IEC 61996–2 - Maritime navigation and radio communication equipment and systems – Ship borne voyage data recorder (VDR) – Part 2: Simplified voyage data recorded (SVDR) – Performance requirements, method of testing and required test results.
7) Any documentation specified in the authorisation or license from the equipment manufacturer.
8) The following reference documents concerning VDR and S-VDR in question:
   - Installation manual.
   - Operation and maintenance manual
   - Information for use by an investigation authority

   (IACS UR Z17 Annex 1 9.4.1, 9.4.2, 9.4.3)

4.2 The documented training procedures specified in A.2.2 are to contain the followings.

1) Procedures to learn the knowledge specified in 4.1 above

2) Procedures for the continuous education and training of the suppliers.

5. Qualifications

The Service Suppliers are to provide evidence that they have been authorized or licensed by the relevant manufacturer to carry out performance tests on VDR and S-VDR.

6. Equipment and Facilities for the Performance Tests of VDR and S-VDR

6.1 The Service Supplier shall have equipment as specified in the authorisation or license from the equipment Manufacturer.

(IACS UR Z17 Annex 1 9.5)

6.2 In case the manufacturer is not specified the equipment necessary, the service suppliers are to have the following equipment available for carrying out of performances test on VDR and S-VDR.

1) Instruments for measuring frequency, voltage, current and resistance

2) Playback hardware of recorded data, speakers, printers and memories

3) Playback software of recorded data

4) Equipment for testing underwater acoustic beacon

7. Report and Certificate

Test report and certificate specified in 3.1.3) and 3.1.4) is to follow requirements listed in the following 7.1 through 7.4.

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

(IACS UR Z17 Annex 1 9.6.1)

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

(IACS UR Z17 Annex 1 9.6.2)

7.3 Where the Service Supplier is also the Manufacturer of the Voyage Data Recorder (VDR) or Simplified Voyage Data Recorder (S-VDR) and has selected to apply IMO - MSC.1/Circular.1222/Rev.1 - Guidelines on Annual Testing of Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (SVDR) 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

(IACS UR Z17 Annex 1 9.6.3)

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

(IACS UR Z17 Annex 1 9.6.4)

8. Demonstration

8.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI's Surveyor to verify that the supplier has appropriate competence for the performance tests specified in the documents submitted.

F. Firms Engaged in Inspection, Performance Testing and Maintenance of Automatic Identification Systems (AIS)

Deleted

G. Firms Engaged in Inspections and Maintenance of Fire Extinguishing Equipment and Systems

1. Extent of Engagement

Inspections and maintenance of fire-extinguishing equipment and systems such as fixed fire extinguishing systems, portable fire extinguishers and fire detection and alarm systems.

2. Extent of Aapproval

2.1 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.

2.2 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.

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

3. Application

This subsection applies to firms engaged in services of fire fighting equipment and systems listed below:

1) Fixed fire-extinguishing systems,
2) Portable fire extinguishers,
3) Fire detection and alarm systems.

4. Work Procedure

A documented work procedure required in A.2.8 and instructions on how to carry out the servicing of the equipment and/or system is at least to contain information on items listed in the following 1) through 6).

1) Reference to the Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate, and to international requirements;
2) Preparation and implementation of the services of firefighting equipment and systems;
3) Records of conditions of defects found during the services;
4) Reporting the results of the services and the verification by BKI's surveyor;
5) Issue of service record certificates;
6) In addition, service suppliers are to make reference to any requirements (e.g. what markings should be appended to the equipment/system).

5. Operators and Supervisors

5.1 Training

5.1.1 Operators and supervisors carrying out the services of firefighting equipment and systems are to have sufficient knowledge as to the following 1) through 15):

1) Construction and services of firefighting equipment and systems
2) Operational methods of the equipment used for servicing of firefighting equipment and systems
3) The latest version of the International Convention for the Safety of Life at Sea (SOLAS), as amended, and International Maritime Organization (IMO) Maritime Safety Committee Circular 850
4) Flag Administration requirements
5) The requirements and inspection instructions for firefighting equipment and systems issued by Administration
6) Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate
7) Type Approval certificates showing any conditions that may be appropriate during the servicing and/or maintenance of fire-extinguishing equipment and systems
8) SOLAS, MSC.1/Circular.1318/Rev.1 (Revised 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
9) MSC/Circ.670 (Guidelines for the Performance and Testing Criteria and Surveys of High Expansion Foam Concentrates for fixed Fire-Extinguishing Systems)
10) MSC/Circ.798 (Guidelines for the Performance and Testing Criteria and Surveys of Medium Expansion Foam Concentrates for fixed Fire-Extinguishing Systems)
11) MSC.1/Circ.1312 (Revised Guidelines for the Performance and Testing Criteria and Surveys of Foam Concentrates for fixed Fire-Extinguishing Systems as corrected by MSC/Circ.1312/Corr.1)
12) MSC.1/Circ.1432 (Revised Guidelines for the maintenance and Inspection of Fire Protection Systems and Appliances, as amended by MSC.1/Circ .1516)
13) IMO Res. A. 951(23) – Improved guidelines for marine portable fire extinguishers
14) MSC.1/Circ.1370 – Guidelines for the design, construction and testing of fixed hydrocarbon gas detection systems
15) Guidelines adopted by IMO for fire extinguishing equipment and systems specifically intended for service by service suppliers

5.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 5.1.1. And the supplier is to provide latest reference documents.

5.2 Qualifications

5.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

5.2.2 As for the competence and experience, operators carrying out the services of firefighting equipment and systems are to comply with the requirements specified in the following .1 and .2.

.1 Operators are to have qualifications for the services of firefighting equipment and systems approved by the authorities concerned.

.2 Operators are to have at least 1-year experience of on-the-job training for the services of firefighting equipment and systems.

5.2.3 Supervisors carrying out the services of firefighting equipment and systems are to have experiences as an operator.

6. Equipment for Services of Fire Fighting Equipment and Systems

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

6.2 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.

6.3 The suppliers are to have the equipment for services of firefighting equipment and systems specified in the following 6.3.1 through 6.3.4.

6.3.1 General

- Reflecting mirrors and lighting to inspect inside of the fire extinguishers,
- Pressure gauges or manometers,
- Cylinder dryers,
- Gases (carbon dioxide, halon, and nitrogen) filling equipment.
- Contents of filling./ Recharging facilities for pressurized bottles, extinguishers and cartridges,
- Specific equipment/spare parts as may be specified by Manufacturer,
- Various scales to weigh items,
- Liquid/gas, flow meters, as appropriate.

6.3.2 Fixed fire-extinguishing systems

- Gas level meters or measuring scales,
- Level measuring equipment for bottles,
- Tools for ventilation test.

6.3.3 Portable fire extinguishers

- Equipment for fixing fire extinguishers, such as a clamp,
- Spanners to open and close caps,
- Caps of fire extinguishers for the pressure test ,
- Pumps for the hydraulic pressure test. Means to hydrostatically pressure test components/systems/storage bottles,
- Chemical analysis equipment and a testing bay.

6.3.4 Fire detection and alarm systems

— Equipment for the operation test,

— Tools for inspections of electrical equipment, such as a tester.

7. Demonstration

7.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, practical demonstration shall be carried out in the presence of BKI's Surveyor to verify that the suppliers have appropriate competence for the services of firefighting equipment and systems. However, as for the firefighting equipment and systems, which are difficult to carry out the demonstration, the submission of the service record certificates may be accepted as substitution.

H. Firm Engaged in Services of Inflatable Liferafts, Inflatable Lifejackets, Hydrostatic Release Units, Marine Evacuation Systems

1. Extent of Engagement

1.1 Servicing of inflatable liferafts, inflatable lifejackets, hydrostatic release units.

1.2 Servicing of marine evacuation systems.

2. Application

This section applies to firms engaged in services of life-saving appliances listed below:

1) Inflatable life rafts,

2) Inflatable lifejackets,

3) Hydrostatic release units,

4) Inflated rescue boats.

3. Procedure

3.1 The supplier shall have documented procedures and instructions for how to carry out service of equipment. Where inflatable liferafts are subject to extended service intervals in accordance with the requirements of SOLAS Regulation III/20.8.3, MSC.1/Circ.1328 should be followed in addition to Resolution A.761(18) as amended by MSC.55(66) and by MSC.388(94).

3.2 A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 3.2.1 through 3.2.4.

3.2.1 Preparation and implementation of the services of life-saving appliances.

3.2.2 Records of conditions of defects found during services.

3.2.3 Reporting the results of the services and the verification by BKI's surveyor.

3.2.4 Issue of service record certificates.

4. Operators and Supervisors

4.1 Training

4.1.1 Operators and supervisors carrying out services of life-saving appliances are to have sufficient knowledge as to the following 1) through 11).

1) Construction and services of life-saving appliances
2) Operational methods of the equipment used for services of life-saving appliances
3) The latest version of the International Convention for the Safety of Life at Sea (SOLAS), as amended, Life-Saving Appliances Code (LSA Code) and International Maritime Organization (IMO) Resolution Assembly 761(18)
4) Flag Administration requirements (where required)
5) The requirements and inspection instructions for life-saving appliances issued by Administration.
6) IMO - Resolution A.761(18) - Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts - (adopted on 4 November 1993), amended by Resolution MSC.55(66) and by MSC.388(94)
7) IMO - Resolution MSC.55(66)
8) IMO – Resolution MSC.388(94)
9) IMO – MSC.1/Circ.1328 – Guidelines for the Approval of Inflatable Liferafts Subject to Extended Service Intervals Not Exceeding 30 Months
10) Manufacturer's servicing manuals, servicing bulletins, instructions and training manuals, as appropriate
11) Type Approval certificates, showing any conditions that may be appropriate during the servicing and/or maintenance of inflatable liferafts, inflatable rescue boats, inflatable lifejackets, and hydrostatic release units
12) LSA code/Chap.IV, 1995 SOLAS Conference Resolution 4 regarding marine evacuation systems

4.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 4.1.1. And the supplier is to provide latest reference documents.

4.2 Qualifications

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

4.2.2 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

4.2.3 As for the competence and experience, operators carrying out the services of life-saving appliances are to comply with the requirements specified in the following .1 and .2.

.1 Operators are to have at least 1 year experience of on-the-job training for the services of lifesaving appliances.

.2 Operators are to have qualifications for the services of the inflatable life rafts approved by the manufacturer, where the services are provided.

4.2.4 Supervisors carrying out the services of life-saving appliances are to have at least 2 years' experience as an operator.

5. Equipment for Services of Life-saving Appliances

5.1 The suppliers are to have the equipment for services of life-saving appliances specified in the following 1) through 6).

1) Pressure gauges
2) Thermometers
3) Barometers
4) Air pumps with functions of air cleaning and drying (including the necessary high-pressure hoses and adapters)
5) A weight scale for inflation gas cylinders
6) Inflation gases

5.2 IMO Res. A.761(18) as amended by MSC.55(66) and by MSC.388(94) gives recommendations on conditions for the approval of servicing stations for inflatable liferafts which shall be observed as relevant. Where inflatable liferafts are subject to extended service intervals, MSC.1/Circ.1328 should also be followed.

6. Demonstration

6.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, practical demonstration shall be carried out in the presence of BKI's Surveyor to verify that the suppliers have appropriate competence for the services of life-saving appliances. However, as for the life-saving appliances, which are difficult to carry out the demonstration, the submission of the service record certificates may be accepted as substitution.

I. Firms Engaged in Tightness Testing of Hatches with Ultrasonic Equipment

1. Extent of Engagement

Ultrasonic tightness testing of closing appliances such as hatches, doors, etc.

2. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 6).

1) Preparation of tightness testing of hatches with ultrasonic equipment
2) Manuals for the construction of hatches
3) Adjustment and operations of the ultrasonic equipment
4) Maintenance of the ultrasonic equipment
5) Criteria for the test results
6) Reporting the test results and the verification by BKI's surveyor

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out tightness testing of hatches with ultrasonic equipment are to have sufficient knowledge as to the following 1) through 5).

1) Operation of the ultrasonic equipment
2) Different hatch designs, function and sealing features
3) Theoretical and practical operation onboard in using ultrasonic equipment
4) Safety operation onboard
5) The requirements and inspection instructions for tightness testing of hatches with ultrasonic equipment issued by BKI

3.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 3.1.1.

3.2 Qualification

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

3.2.2 As for the competence and experience, operators carrying out the tightness testing of hatches with ultrasonic equipment are to comply with the requirements specified in the following 1) through 3).

1) Operators are to have appropriate qualifications approved by the authorities concerned or those considered equivalent thereto.
2) Operators are to have experience carrying out the operation and the maintenance of different hatches.
3) Operators are to have at least 1 year experience of on-the-job training for tightness testing of hatches with ultrasonic equipment.

3.2.3 Supervisors carrying out the tightness testing of hatches with ultrasonic equipment are to have experiences as an operator.

4. Equipment Used for Tightness Testing of Hatches with Ultrasonic Equipment

4.1 The suppliers are to have the ultrasonic equipment in compliance with the requirements specified in the following 1) through 3).

1) The transmitter is to indicate a uniform value at any points of a tested area, under the condition which the hatch cover is completely open.
2) The measurement sensitivity of the receiver is to be adjustable.
3) The receiver is to be provided with an audible signal and a visual readout in decibel.

4.2 The ultrasonic equipment is to be deemed appropriate by BKI.

4.3 At least, biennial calibration tests are to be carried out by the manufacturer or the laboratories authorized by the manufacturer.

5. Demonstration

5.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, practical demonstration on actual ships shall be carried out in the presence of BKI's Surveyor to verify that the suppliers have appropriate competence for the tightness testing of hatches with ultrasonic equipment listed in the documents submitted.

J. Firms Engaged in Testing of Coating Systems in Accordance with IMO Resolution MSC.215(82) as Amended and IACS UI SC223 and/or MSC.288(87) as Amended

1. Extent of Engagement

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

2. Document to be Submitted

The following documents are to be submitted in addition to those specified in A.5 by the laboratory:

1) A detailed list of the Laboratory test equipment for the coating approval according to the IMO Resolution MSC.215(82) as amended and/or MSC.288(87) as amended.

2) A detailed list of reference documents comprising a minimum those referred to in IMO Resolution MSC.215(82) as amended and/or MSC.288(87) as amended for the coating approval.

3) A sample daily or weekly log/form for recording test condition and observations including unforeseen interruption of the exposure cycle with corrective actions.

4) Details of any sub-contracting agreements (if applicable).

5) Comparison test report with an approved coating system or laboratory if available.

3. Work Procedure

3.1 A documented work procedure required in A.2.8 is at least to contain information on items listed in the following:

1) Details of test panel preparation, procedure of test panel identification, coating application, test procedures and a sample test report;

2) Details of exposure method and site for weathering primed test panels;

3) Criteria for the test results of coating systems;

4) Reporting the test results.

4. Operators and Supervisors

4.1 Training

4.1.1 Operators and supervisors carrying out testing of coating systems are to have sufficient knowledge as to the following:

— MSC.215(82) or MSC.288(87) as may be amended;

— operational methods of the equipment used for the testing of coating systems.

4.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 4.1.1 and the supplier is to provide latest reference documents.

5. Equipment for Testing of Coating Systems

5.1 The suppliers are to have the equipment for testing of coating systems specified in the following:

- tank for testing on simulated ballast tank coating (Equipment for wave movement simulation is not necessary for firms only engaged in cross over testing),
- condensation chamber (Not necessary for firms only engaged in cross over testing),
- infrared (IR) identification equipment,
- detector,
- tensile testing machines.

5.2 The suppliers are to have the equipment for testing of coating system for cargo oil tanks specified in the following:

- gas-tight cabinet test equipment,
- immersion test equipment,
- infrared (IR) identification equipment,
- detector,
- tensile testing machines.

6. Reporting

The report shall be based on the following guidance:

- Guidance for Marine Industry (Pt.1, Vol.AC) Sec.6, R-101: Model Report for IMO Resolution MSC.215(82) Annex 1 “Test Procedures for Coating Qualification”
- Guidance for Marine Industry (Pt.1, Vol.AC) Sec.6, R-102: Model Report for IMO Resolution MSC.215(82) Annex 1 “Test Procedures for Coating Qualification”, Section 1.7 – Crossover Test

7. Demonstration

7.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, demonstration shall be carried out in the presence of Surveyor to verify that the suppliers have appropriate competence for the services of testing of coating systems. However, the submission of the comparison test report specified in 2.5). and deemed appropriate by BKI may be accepted as substitution.

K. Firms Engaged in Maintenance, Thorough Examination, Operational Testing, Overhaul and Repair of Lifeboats and Rescue Boats, Launching Appliances, and Release Gear

1. Extent of Engagement

Maintenance, thorough examination, operational testing, overhaul and repair of:

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

(IACS URZ17 13.1)

2. Extent of Approval

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

(IACS URZ17 13.2.1)

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

Such approval shall include, as a minimum:

— employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or an equipment manufacturer's established certification program. In either case, the certification program shall be based on paragraph 4. for each make and type of equipment for which service is to be provided; and,

— compliance with provisions of paragraphs 5., 6., and 7.

(IACS URZ17 13.2.2)

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

(IACS URZ17 13.2.3)

3. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 4).

1) Preparation and implementation of the service lifeboats, rescue boats, fast rescue boats, launching appliances and release gear.

2) Records of condition of defects found during services.

3) Reporting the results of the services and the verification by BKI Surveyor.

4) Issue of service record certificates.

4. Certification of Personnel

4.1 Personnel for the work specified in 1. shall be certified by the manufacturer or the Service Supplier for each make and type of the equipment to be worked on. Approved Service Supplier is allowed to certify its own personnel (i.e. employed by the same service supplier) only.

(IACS UR Z17 13.3.2)

4.2 The education for initial certification of personnel are to be documented and address, as a minimum:

1) Causes of lifeboat and rescue boat accidents

2) The latest version of relevant rules and regulations, including International Conventions (SOLAS, as amended, LSA Code, and IMO Resolution MSC.402(96)/Corr.1) as well as Flag Administration requirements (where required).

3) Design and construction of lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats, including on load release gear and launching appliances

4) Education and practical training in the procedures specified in section 6 of the Annex to IMO Resolution MSC.402(96)/Corr.1 for which certification is sought

5) Detailed procedures for thorough examination, operational testing, repair and overhaul of lifeboats (including free-fall lifeboats), rescue boats and fast rescue boats, launching appliances and on load release gear, as applicable;

6) Procedures for issuing a report of service and statement of fitness for purpose based on IMO Resolution MSC.402(96)/Corr.1 (annex, paragraph 5.3); and

7) Work, health and safety issues while conducting activities on board.

(IACS UR Z17 13.3.2)

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

(IACS UR Z17 13.3.3)

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

(IACS UR Z17 13.3.4)

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

(IACS UR Z17 13.3.5)

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

(IACS UR Z17 13.3.6)

5. Reference Documents

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

— IMO - Resolution MSC.402(96)/Corr.1, Requirements for Maintenance, Thorough Examination, Operational Testing, Overhaul and Repair of Lifeboats and Rescue Boats, Launching Appliances and Release Gear

— IMO - Resolution A.689(17), recommendation on testing of life-saving appliances and, for life-saving appliances installed on board on or after 1 July 1999

— IMO - Resolution MSC.81(70), as amended, revised recommendation on testing of life-saving appliances

— Manufacturer’s instructions (including updates, amendments and safety notices) for repair work involving disassembly or adjustment of on-load release mechanisms and davit winches

— Type Approval certificate showing any conditions that may be appropriate during the servicing and/or maintenance of lifeboats, launching appliances and on-load release gear

(IACS UR Z17 13.4)

6. Equipment and Facilities

The Service Supplier is to have the following:

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

— Access to appropriate parts and accessories as specified by the equipment manufacturer for maintenance and repair

— For servicing and repair work involving disassembly or adjustment of on-load release mechanisms, availability of genuine replacement parts as specified or supplied by the equipment manufacturer.

(IACS UR Z17 13.5)

7. Reporting

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

(IACS UR Z17 13.6)

8. Demonstration

8.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI Surveyor to verify that the suppliers have appropriate competence for the services of lifeboats, launching appliances, and on-load gear. However, as for the lifeboats, launching appliances and on-load release gear, which are difficult to carry out the demonstration, the submission of the service record certificates may be accepted as substitution.

L. Firms Engaged in Inspections and Maintenance of Self Contained Breathing Apparatus

1. Extent of Engagement

This subsection applies to firm engaged in inspections and maintenance of self-contained breathing apparatus, Emergency Escape Breathing Devices (EEBD).

2. Extent of Approval

2.1 The Service Suppliers shall document and demonstrate that it has knowledge of the equipment and systems sufficient to carry out the inspections and testing of self-contained breathing apparatus to identify standards and to make the necessary evaluation of the condition of the equipment.

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

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

3. Work Procedures

3.1 The 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.

3.2 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.

4. Operators and Supervisors

4.1 Training

4.1.1 Operators and supervisors carrying out services of self-contained breathing apparatus are to have sufficient knowledge as to the following 1) through 3).

1) Manufacturers' servicing manuals, servicing bulletins, instructions and training manuals, as appropriate

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

3) The requirements and inspection instructions issued by Administration (where required)

4.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 4.1.1.

5. Equipment and Facilities

5.1 General Requirements

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

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

5.2 Equipment

5.2.1 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.

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

— Spare and tools for repair, maintenance and servicing of self-contained breathing apparatus in accordance with the requirements of the manufacturers

— Various scales to weigh items

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

— Flow meters; and

— Pressure gauges or manometers

— Equipment for checking air quality

— Recharging facilities for breathing apparatus

6. Demonstration

6.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI Surveyor to verify that the suppliers have appropriate competence for inspections and maintenance of self-contained breathing apparatus. However, as for self-contained breathing apparatus, which are difficult to carry out the demonstration, the submission of the service record certificates may be accepted as substitution.

M. Firms Engaged in Examination of RO-RO Ships Bow, Stern, Side and Inner Doors

1. Extent of Engagement

1.1 This subsection applies to firm engaged in 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.

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

2. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 2.1 through 2.3.

2.1 Preparation and implementation of the examination of RO-RO ships bow, stern, side and inner doors. The supplier shall:

- have access to drawings and documents, including the Operating and Inspection Manual;
- have access to the service history of the doors;
- use, complete and sign a checklist which has been found acceptable by BKI.

2.2 Records of condition of defects found during examination.

2.3 Reporting the results of the examination to Surveyor.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out the examination of RO-RO ships bow, stern, side and inner doors are to have sufficient knowledge as to the following .1 through .3.

1) IMO - International Convention on the Safety of Life at Sea (SOLAS) 74/78, as amended
2) ISO 9002:1994 - Quality systems - Model for quality assurance in production, installation and servicing
3) IACS UR Z24 - Survey Requirements for Shell and Inner Doors of RO-RO ships, or Rules for Classification and Surveys (Pt.1 Vol.I) Sec.4.II.C.

(IACS UR Z17 Annex 1 8.5)

3.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 3.1.1.

3.2 Qualifications

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

3.2.2 As for the competence and experience, operators carrying out the examination of RO-RO ships bow, stern, side and inner doors are to comply with the requirements specified in the following 3.2.2.1 and 3.2.2.2.

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

(IACS UR Z17 Annex 1 8.4)

.2 Operators are to have at least 1 year tutored on-the-job training for the examination of RORO ships bow, stern, side and inner doors.

(IACS UR Z17 5.2.2)

3.2.3 Supervisor is to have had a minimum of two years experience as operator/technician/inspector within the activity and to have a minimum two years related education from a technical school.

(IACS UR Z17 Annex 1 8.3)

4. Equipment for Examination of RO-RO Ships Bow, Stern, Side and Inner Doors

The suppliers are to have the equipment for examination of RO-RO ships bow, stern, side and inner doors specified in the following 4.1 through 4.4.

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

— Equipment for measuring clearances (i.e. feeler gauges, vernier calipers, micrometers)

— Non-destructive test (i.e. dye penetrant, magnetic particle inspection)

(IACS UR Z17 Annex 1 8.6.1)

4.2 For tightness testing:

— Ultrasonic leak detector or equivalent

(IACS UR Z17 Annex 1 8.6.2)

4.3 For inspection of hydraulic operating system:

— Pressure gauges

— Particle counter for analysing the quality of hydraulic fluid

(IACS UR Z17 Annex 1 8.6.3)

4.4 For inspection of electric control system and indication system:

— Digital multi-meter

— Earth fault detector

(IACS UR Z17 Annex 1 8.6.4)

5. Demonstration

5.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI Surveyor to verify that the suppliers have appropriate competence for the examination of RO-RO ships bow, stern, side and inner doors. However, as for the examination of RO-RO ships bow, stern, side and inner doors which are difficult to carry out the demonstration, the submission of the examination records may be accepted as substitution.

N. Firms Engaged in Inspections of Low Location Lighting Systems Using Photo Luminescent Materials and Evacuation Guidance Systems Used as an Alternative to Low-location Lighting Systems

1. Extent of Engagement

1.1 This subsection applies to firm engaged in inspection of luminance measurements on board ships of low location lighting systems using photo luminescent materials.

2. Work Procedure

2.1 A documented work procedure required in A.2.8 is at least to contain information on inspection preparation, selection and identification of test locations.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out the inspections are to have sufficient knowledge as to the following 1) through 5).

1) IMO - International Convention on the Safety of Life at Sea (SOLAS), 74/78 Ch. II-2, Pt. D, Reg. 13.3.2.5 – Marking of escape routes
2) IMO – Fire Safety Systems (FSS Code), Ch. 11 – Low-location lighting systems
3) IMO - Resolution A.752(18) - Guidelines for the Evaluation, Testing and Application of Low-Location Lighting on Passenger Ships - (adopted on 4 November 1993)
4) ISO 15370:2010 - Ships and marine technology - Low-location lighting on passenger ships – Arrangement
5) MSC/Circ.1168 – Interim guidelines for the testing, approval and maintenance of evacuation guidance systems used as an alternative to low-location lighting systems

3.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 3.1.1.

3.2 Qualifications

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

3.2.2 As for the competence and experience, operators carrying out the inspections to comply with the requirements specified in the following .1 and .2.

.1 Operators are to have adequate knowledge of the applicable international requirements (namely SOLAS reg. II-2/13.3.2.5, IMO Res. A.752 (18) - Guidelines for the Evaluation, Testing and Application of Low-Location Lighting on Passenger Ships, ISO 15370-2010, FSSS Code Chapter 11).

.2 Operators are to be able to document a theoretical and practical training onboard in using equipment specified.

4. Equipment

4.1 The suppliers are to have fast-response photometer head incorporate with CIE (International Commission on Illumination) photopic correction and have a measurement range of at least 10^{-4} cd/m^2 to 10 cd/m^2.

5. Reporting

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

6. Verification

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

7. Demonstration

7.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI's Surveyor to verify that the supplier has appropriate competence for the inspection specified in the documents submitted.

O. Firms Engaged in Sound Pressure Level Measurements of Public Address and General Alarm Systems on Board Ships

1. Extent of Engagement

This subsection applies to firm engaged in sound pressure level measurements of public address and general alarm systems on board ships.

2. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on inspection preparation, calibration, selection and identification of test locations.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out the services of firefighting equipment and systems are to have sufficient knowledge as to the following 1) through 7).

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

3.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 3.1.1.

3.2 Qualifications

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

3.2.2 As for the competence and experience, operators carrying out the measurements are to comply with the requirements specified in the following .1 and .2.

.1 Operators are to have adequate knowledge of the applicable international requirements (SOLAS Reg. III/4 and III/6, LSA CODE Chapter VII/7.2, IMO Code on alarms and indicators, 1995).

.2 Operators are to be able to document a theoretical and practical training onboard in using equipment specified.

4. Equipment

4.1 The suppliers are to have 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.

5. Reporting

The report shall describe, as a minimum, the environmental conditions of the tests and, for each test location, the ambient noise level or the speech interference level, as appropriate for the measurements to be carried out. The report shall conform to any other specific requirement of BKI.

6. Verification

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

7. Demonstration

7.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI's Surveyor to verify that the supplier has appropriate competence for the inspection specified in the documents submitted.

P. Firms Engaged in Measurements of Noise Level Onboard Ships

1. Extent of Engagement

Sound pressure level measurements onboard Ship.

2. Work Procedure

Documented work procedures required in A.2.8 are at least to contain information on items listed in the following 1) through 4).

1) inspection preparation,
2) selection and identification of sound level measurement locations,
3) calibration checks, and,
4) report preparation.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out the measurements of noise level are to have sufficient knowledge as to the following 1) through 3).

1) Knowledge in the field of noise, sound measurements and handling of measurement equipment;

2) Adequate knowledge of the applicable international requirements (SOLAS Regulation II-1/3-12, as amended, and IMO Code on noise levels onboard Ships, as amended);

3) Training concerning the procedures specified in IMO Code on Noise Levels onboard Ships.

3.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 3.1.1 and information on the item listed below:

1) SOLAS 1988, as amended (Reg.II-1/3-12),

2) Resolution A.468(XII) and IMO Resolution MSC.337(91) code on noise levels on board ships,

3) Resolution A.343(IX) Recommendation on methods of measuring noise levels at listening posts ,

4) BKI Guidance for Crew Habitability on Ships (Pt.7, Vol.B).

3.2 Qualifications

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

3.2.2 As for the competence and experience, operators carrying out the measurements are to comply with the requirements specified in the following 1) through 2).

1) Operators are to be able to document theoretical and practical training on-board in using a sound level meter.

2) Operators are to have at least 1 years' experience, including participation in a minimum of 5 measurement campaigns as an assistant operator.

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

4. Equipment

The suppliers are to have the equipment for measurements specified in the following 4.1 through 4.4.

4.1 Sound level meters

Measurement of sound pressure levels shall be carried out using precision integrating sound level meters. Such meters shall be manufactured to IEC 61672-1(2002-05), as amended, type/class 1 standard as applicable, or to an equivalent standard acceptable to the Administration. Class/Type 1 sound level meters manufactured according to IEC 651/IEC 804 (as amended), may be used until 1 July 2016.

4.2 Octave filter set

When used alone, or in conjunction with a sound level meter, as appropriate, an octave filter set shall conform to IEC 61260 (1995)[1)], as amended, or an equivalent standard acceptable to the Administration.

4.3 Sound Calibrator

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

The edition of the calibration standard is to correspond with the edition of the manufacturing standard for the instruments. Sound calibrator and sound level meter shall be verified at least every two years by a national Standard laboratory or a competent laboratory accredited according to ISO/IEC 17025:2017, as amended or recognized national or international standard. The calibration of

[1)] Octave-band and fractional-octave-band filters

sound calibrators should be carried out in accordance with IEC 60942 Appendix B, whilst the calibration of sound level meters is to be in accordance with IEC 61672-3. A record with a complete description of the equipment used shall be kept, including a calibration log.

4.4 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.

5. Reporting

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

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

6. Verification

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

Q. Firms Engaged in Tightness Testing of Primary and Secondary Barriers of Gas Carriers with Membrane Cargo Containment Systems for Vessels in Service

1. Extent of Engagement

Firms carrying out the following:

— Global Vacuum Testing of Primary and Secondary Barriers,

— Acoustic Emission (AE) Testing,

— Thermographic Testing.

2. Firms Engaged in Global Testing of Primary and Secondary Barriers

2.1 Authorization

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

2.2 Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 3).

1) Preparation of the testing

2) Implementation of the testing

   Testing is to be carried out in accordance with cargo containment system designer’s procedures as approved by BKI.

3) Reporting the results of the testing

2.3 Equipment

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

2.4 Reporting

The report is to contain the following:

— Date of testing

— Identity of test personnel

— Vacuum decay data for each tank

— Summary of test results

3. Firms Engaged in Acoustic Emission (AE) Testing

3.1 Work Procedure

A documented work procedure required in A.2.8 is to be established based on recognized national or international industrial standards. The procedure is at least to contain information on items listed in the following 1) through 6).

1) Details of personnel responsibilities and qualification
2) Instrumentation
3) Test preparation
4) Test method
5) Signal processing
6) Evaluation and reporting

Note:

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

3.2 Qualification

3.2.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

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

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

3.3 Equipment

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

3.4 Evaluation of Acoustic Emission (AE) Testing

The evaluation must be carried out by the supervisor or individuals certified to a recognized national or international industrial standard (e.g. Level II, ISO-9712 as amended or SNT-TC-1A as amended) and have one-year experience at Level II.

3.5 Reporting

The report is to contain the following:

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

4. Firms Engaged in Thermographic Testing

4.1 Authorization

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

4.2 Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 3).

1) Preparation of the testing of thermographic testing
2) Implementation of the testing of thermographic testing

   Testing is to be carried out in accordance with the cargo containment system designer's procedures as approved by BKI
3) Reporting the results of the testing

4.3 Qualification

4.3.1 In general, one or more operators and supervisors are to be attached to the suppliers respectively.

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

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

4.4 Equipment

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

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

4.5 Evaluation of thermographic images

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

4.6 Reporting

The report is to contain the following:

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

5. Demonstration

5.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, on board demonstration shall be carried out in the presence of BKI's Surveyor to verify that the supplier has appropriate competence for the testing specified in the documents submitted.

R. Firms Engaged in Survey Using Remote Inspection Techniques (RIT) as an Alternative Means for Close-up Survey of the Structure of Ships and Floating Offshore Structures

1. Definitions

1.1 Close-Up Survey

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

1.2 Remote Inspection Techniques (RIT)

RIT is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor (refer to Guidance for Marine Industry (Pt.1, Vol.AC) Sec.3, R-42). Remote inspection techniques may include the use of:

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

2. Extent of Engagement

2.1 Close-up Survey of ships' structure and floating offshore structures' by remote inspection techniques.

2.2 For in-water close-up survey of the internal compartments by Remotely Operated Vehicle (ROV), suppliers are also to hold separate approval as a "Firm carrying out an in-water survey on ships and floating offshore structures by diver or Remotely Operated Vehicle (ROV)" (see C.).

3. Work Procedure

A documented work procedure required in A.2.8 is at least to contain information on items listed in the following 1) through 11).

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

(IACS UR Z17 Annex 1 16.8)

4. Operators and Supervisors

4.1 Training

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

(IACS UR Z17 Annex 1 16.3)

4.1.2 Knowledge of the following shall be documented:

— Marine and/or offshore nomenclatures.
— The structural configuration of relevant ships types and MOUs, including internal structure.
— The remote inspection equipment and its operation.

— Survey plans for examination of hull spaces of various configurations, including appropriate flight plans if using a UAV.

— Thickness measurement (TM) and non-destructive test (NDT) in accordance with a recognised National or International Industrial NDT Standard when these are part of the service. Suppliers undertaking TMs are to hold separate approval as a 'Firm engaged in thickness measurements on ships' (see B.).

(IACS UR Z17 Annex 1 16.3)

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

(IACS UR Z17 Annex 1 16.4)

4.1.4 The supplier shall maintain the following:

— Records of training,

— Operator statutory and regulatory certificates and licences.

(IACS UR Z17 Annex 1 16.9)

4.2 Qualifications

4.2.1 Operators

1) The operator carrying out the inspection shall be certified according to the recognized national requirements or an equivalent industrial standard (e.g. YYY Level) and have had at least one year's experience as an assistant carrying out inspections of ship's and/or MOU's structure (including participation in a minimum of five different assignments).

2) The operators of those RIT which require, according to the international and national legislations, to be licensed for their use shall hold valid documentation issued by the appropriate Bodies (e.g. UAV Pilots are to be qualified and licenced in accordance with applicable national requirements).

(IACS UR Z17 Annex 1 16.6)

4.2.2 Supervisors

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

(IACS UR Z17 Annex 1 16.5)

5. Equipment

5.1 The following shall be available:

— Remotely operated platform with data capture devices capable of operation within an enclosed space;

— Means of powering the platforms with sufficient capacity to complete the required inspections, including spare batteries, if applicable;

— Data collection devices which may include cameras capable of capturing in high definition both video images and still images.

- Illumination equipment;
- High definition display screen with live high definition feed from inspection cameras. (When this is part of the RIT);
- Means of communication;
- Data recording devices, as applicable;
- Equipment for carrying out thickness gauging and/or non-destructive testing, as relevant to the work to be performed (when this is part of the service).

5.2 The supplier shall maintain the following:

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

6. Verification

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

S. Firms Engaged in Non-Destructive Testing (NDT)

1. Extent of Engagement

This subsection applies to firms (i.e. independent NDT companies and internal departments of fabricators, e.g. shipyards, hull block/section fabricators) engaged in carrying out NDT and advance NDT (ANDT) on the new construction of ship and offshore structures. In this subsection, such firm will be referred to as the Service Supplier.

NDT is also known as non-destructive examination (NDE), non-destructive inspection (NDI) and non-destructive evaluation (NDE).

NDT is comprising, but not limited to the following methods and techniques:

- Magnetic Particle Testing (MT),
- Penetrant Testing (PT),
- Radiographic Testing (RT),
- Visual Testing (VT), Ultrasonic Testing (UT),
- Electromagnetic Testing (ET i.e., Eddy Current Testing and/or Alternating Current Field Measurements (ACFM)).

ANDT includes advanced methods such as:

- Digital Radiography (RT-D, techniques within the method RT e.g., Computed Radiography or Direct Radiography),
- Phased Array Ultrasonic Testing (PAUT, technique within the method UT),
- Time of Flight Diffraction (TOFD, technique within the method UT),

— Automated Ultrasonic Testing (AUT, a technique by which an object is tested by ultrasound using probes operating under mechanical control and where ultrasonic data is collected automatically).

Wherever there is a reference to NDT mentioned in the following paragraphs, it also includes ANDT.

The NDT service covers the service application to the following hull structure and associated items at the fabrication stage during new construction:

— The welding of components that are integrated into the ship or offshore structure;

— The fabrication of independent fuel or cargo tanks (including those intended for low flashpoint fuels, e.g. type A, B and C independent tanks as described in IMO IGC and IGF Codes);

— Items listed within the definition of hull structure, as defined in Rules for Classification and Surveys (Pt.1 Vol.I) Annex A.2;

— Rudders of welded construction.

2. Extent of Approval

2.1 The Service Suppliers shall demonstrate, as required in the following requirements, that it is using appropriate procedures, has qualified and certified personnel and has implemented written procedures for training, experience, education, examination, certification, performance, application, control, verification and reporting of NDT.

2.2 The extent of the approval shall include and be limited to the NDT methods, NDT techniques and personnel upon which approval will be granted.

3. Document to be Submitted

The following documents are to be submitted in addition to those specified in A.5.2.1 by the Service Supplier:

1) information on the structure of the Service Supplier's Quality Management System;

2) for Service Supplier with in-house certification of personnel scheme; a written practice developed in accordance with a recognised standard or recommended practice (i.e. ASNT's SNT-TC-1A, 2020, ANSI/ASNT CP-189, 2020 or similar);

3) operational work procedures for each NDT method including selection of the NDT technique;

4) procedure for supervisor's authorisation of NDT operators;

5) any legal proceedings against the company in the past/currently in the courts of law, where applicable;

6) written statement issued by the employer, based upon the scope of certification, authorising the operator to carry out specified tasks;

7) for Service Suppliers which obtain certification from an accredited certification body; a list of documented training and experience for NDT operators within the relevant NDT Service area, including qualifications and third party certification per ISO 9712:2021 based certification schemes.

4. Quality Management

In addition to those specified in A.3, the Service Supplier shall have a documented quality management system, covering at least:

1) work procedures for all tasks and operations, including the various NDT methods and NDT techniques for which The Service Supplier is involved;
2) maintenance of records for NDT operators' and the supervisors' training, qualification and certification;
3) certification of NDT operators including re-validation and recertification;
4) procedure for test of operators' visual acuity;
5) order reference system where each engagement is traceable to when, who and where the test was carried out;
6) recording and reporting of information, including retention time of records;
7) feedback and continuous improvement;
8) internal audits;
9) the provision of accessibility to required codes, standards and procedures to assist NDT operators.

A documented quality system complying with the most current version of ISO/IEC 17020:2012 and including the above would be considered acceptable. The Service Supplier should satisfy the requirements of Type A or Type B or Type C inspection body, as described in ISO/IEC 17020:2012. . In all cases, production staff shall not be allowed to inspect their own work in the case of Type C inspection body.

5. Work Procedure

5.1 A documented work procedure required in A.2.8 is at least to contain all relevant information relating to the inspection (e.g. NDT methods, calibration checks, inspection procedure) including defect evaluation against acceptance criteria in accordance with BKI rules.

5.2 All NDT procedures and instructions shall be properly documented in such a way that the performed testing can be easily retraced and/or repeated at a later stage.

5.3 All NDT procedures and instructions are to be written, verified or approved by the Service Supplier's Level 3 (either internal or external, as described in 7.1).

5.4 All NDT procedures are to be acceptable to BKI.

6. Qualification and Certification of NDT Personnel

6.1 The Service Supplier is responsible for the qualification and preferably 3rd party certification of its supervisors and operators to a recognised certification scheme based on ISO 9712:2021.

6.2 Personnel qualification to an employer based qualification scheme as e.g. SNT-TC-1A:2020 or ANSI/ASNT CP-189:2020 may be accepted if the Service Supplier's written practice is reviewed and found acceptable by BKI.

For operators holding certificates issued via an employer based scheme, the employer 's certification shall be deemed revoked when employment is terminated by either party.

6.3 The Service Supplier's written practice shall as a minimum, except for the impartiality requirements of a certification body and/or authorised body, generally comply with the requirements of ISO 9712:2021.

6.4 The supervisors' and operators' certificates and competence shall comprise all industrial and product sectors and techniques being applied by the Service Supplier.

Note:

1) *Industrial sector means section of industry or technology where specialised NDT practices are used, requiring specific product-related knowledge, skill, equipment and/or training.*

2) *Product sector means a category of component that may be defined by type of manufacturing, fabrication, and/or shape, which may have unique, and/or general manufacturing/fabrication defect characteristics. Product sector examples include (but not limited to): castings, wrought products (forgings), rolled products, extruded products, and welds. NDT personnel may hold certification in a method which is related to a product sector.*

6.5 Level 3 personnel shall be certified by one of the following means:

1) obtain certification from an accredited certification body;

2) obtain certification from an employer based scheme via the examination method, as detailed in the written practice. It is not permissible to directly appoint a level 3 without examination if the intended certification route is from an employer based scheme.

7. Operators and Supervisors

7.1 Supervisors

7.1.1 The Service Supplier shall have a supervisor or supervisors, responsible following:

1) validate NDT instructions and procedures established and reviewed by level 3 personnel;

2) review of NDT reporting;

3) supervise all tasks and NDT operations at all levels;

4) inspection of NDT equipment, tools and calibration;

5) re-evaluate the qualification of the operators annually on behalf of the Service Supplier.

7.1.2 Normally, the Service Supplier shall employ (on a full-time basis) a level 3 supervisor, certified to level 3 in the applicable method(s). It is recognized that a Service Supplier may not directly employ a Level 3 in all the stated methods practiced. In such cases, it is permissible to employ an external, Level 3 in those methods not held by the full-time Level 3(s) of the Service Supplier.

7.1.3 Alternatively, and by agreement with BKI, the Service Supplier may appoint an internal (full-time employed) supervisor of NDT activities, who does not hold level 3 certification. In this case, the supervisor shall be certified to a minimum of level 2.

7.1.4 For Service Suppliers operating this alternative approach, the Service Supplier shall comply with all other requirements of this Rules and shall employ (either part time or on a contract basis) Level 3 NDT Services (to carry out functions such as procedure development, procedure approval, consultancy, review etc.) from outside the Service Supplier organization. The appointed external level 3 shall be certified by an accredited certification body in all the applicable methods appropriate to the scope of the NDT operations.

7.2 Operators

7.2.1 The operator carrying out the NDT and interpreting indications, shall as a minimum, be qualified and certified to Level 2 in the NDT method(s) concerned and as described in 6.

However, operators only undertaking the gathering of data using any NDT method and not performing data interpretation or data analysis may be qualified and certified as appropriate, at level 1.

7.2.2 The operator shall have adequate knowledge of materials, weld, structures or components, NDT equipment and limitations that are sufficient to apply the relevant NDT method for each application appropriately.

8. Sub-contractors

8.1 The Service Supplier shall give information of agreements and arrangements if any part(s) of the NDT services provided are subcontracted, included level 3 NDT Services (as described in 7.1).

8.2 The Service Supplier, in the following-up of subcontracts shall give emphasis to the quality management system of the subcontractor. Subcontractors shall meet the same requirements placed on Service Suppliers for any NDT performed.

9. Equipment

9.1 The Service Supplier shall maintain records of the NDT equipment used and detail information related to maintenance, calibration and verification activities.

9.2 Where the Service Supplier hires equipment from external resources, the equipment shall have updated calibration records and the operators shall be familiar with the specific equipment type prior to using it.

9.3 Under any circumstance, the Service Supplier shall possess sufficient equipment to carry out the NDT services being a part of the NDT scope required by BKI.

9.4 Where the equipment is of unique nature, the NDT operators shall be trained by competent personnel in the operation and use of the equipment before carrying out NDT using this equipment.

10. Reporting

10.1 All NDT shall be properly documented in such a way that the performed testing and examination can be easily retraced and/or repeated at a later stage. The reports shall identify the defects present in the tested area, and a conclusive statement as to whether the material, weld, component or structure satisfies the acceptance criteria or not.

10.2 The examination report shall as a minimum have a content covering the same items as listed in Rules for Welding (Pt.1, Vol.VI), Sec.10.D.2. Applicable standard, NDT procedure and acceptance criteria shall comply with BKI rules.

10.3 All reports shall also include the approval number for the Service Supplier.

10.4 Reports shall be signed by the personnel with the appropriate level of certification, and the appropriate signatory status as defined in the Quality Management System.

11. Verification

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

12. Demonstration

12.1 Unless a documentary review can not be carried out as specified in A.5.2.2.2, demonstration shall be carried out in the presence of BKI's Surveyor to verify that the Service Supplier has appropriate competence for the inspection specified in the documents submitted.

(IACS UR Z17 4.1.1)

T. Firms Engaged in Watertight Cable Transit Seal Systems Inspection on Ships and Floating Offshore Structures

1. Extent of Engagement

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

(IACS UR Z17 Annex 1 17.1)

2. Extent of Approval

2.1 The contents of this Sub-Section apply equally to manufacturers or shipyards when they are acting as Service Suppliers.

(IACS UR Z17 Annex 1 17.2.1)

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

- employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or an equipment manufacturer's established certification program. In either case, the certification program shall be based on the paragraph 3. for each make and type of equipment for which inspection is to be provided, and
- compliance with provisions of paragraphs 4., 5., and 6..

(IACS UR Z17 Annex 1 17.2.2)

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

3. Qualifications and Training of Personnel

3.1 Personnel for the work specified in 1. shall be trained and qualified in the inspection for which they are authorised, for each make and type of equipment for which they provide the inspection.

(IACS UR Z17 Annex 1 17.3.1)

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

- Procedures and instructions for the inspection of the watertight cable transit seal systems;
- Common problems found with the initial installation and in-service inspections of watertight cable transit seal systems;
- Relevant rules and regulations, including International Conventions;
- Procedures for reporting on initial installation and in-service inspections of watertight cable transit seal systems in the Watertight cable Transit Seal Systems Register.

(IACS UR Z17 Annex 1 17.3.2)

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

(IACS UR Z17 Annex 1 17.3.3)

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

(IACS UR Z17 Annex 1 17.3.4)

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

(IACS UR Z17 Annex 1 17.3.5)

4. Reference Documents

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

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

— Type Approval certificate showing any conditions that may be appropriate during the installation or maintenance of the watertight cable transit seal system.

(IACS UR Z17 Annex 1 17.4)

5. Equipment and Facilities

The Service Supplier is to have access to the following:

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

(IACS UR Z17 Annex 1 17.5)

6. Reporting

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

(IACS UR Z17 Annex 1 17.6)

U. Firms Engaged in Preparation and Maintenance of Inventory of Hazardous Materials (IHM)

1. Extent of Engagement

This subsection applies to firms engaged in the following services:

1) visual/sampling check onboard ships, for the development of the Inventory of Hazardous Materials (IHM),

2) testing laboratories for hazardous materials,

3) maintenance of inventory of hazardous materials (IHM).

2. Extent of Approval

2.1 Service Suppliers engaged in preparation and maintenance of IHM are to have professional knowledge of hazardous materials licensed as required and, are trained and equipped experts, in particular with regards to the evaluation and sampling of hazardous materials and materials containing hazardous materials as:

a) Hong Kong Convention, Appendix 1:

- — Asbestos;
- — ozone depleting substances (ODS);
- — polychlorinated biphenyls (PCB);
- — anti-fouling compounds and systems.

b) Hong Kong Convention, 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;
- — certain shortchain chlorinated paraffins (alkanes, C10-C13, chloro).

3. Operators and Supervisors

3.1 At least one (1) of the Supervisor shall be qualified, and licensed as required, according to a recognized national or international industrial standard, for the hazards specified, and have a minimum 2 years' experience on it.

3.2 At least one (1) of the Operators carrying out the sampling/visual check hall be qualified, and licensed as required, according to a recognized national or international industrial standard, for the hazards specified, and have a minimum 1 year experience on it.

3.3 Operators and supervisors carrying out the sampling/visual check are to have sufficient knowledge as to the following:

1) Hong Kong Convention: The 'Hong Kong international convention for the safe and environmentally sound recycling of ships, 2009' SR/CONF/45.

2) IMO IHM guidelines: Guidelines for the development of the inventory of hazardous materials Resolution IMO Res. MEPC. 269(68).

3) Survey and certification guidelines: 2012 Guidelines for the survey and certification of ships under the Hong Kong convention Resolution IMO Res. MEPC. 222(64).

4) BKI Guidance for Marine Industry (Pt.1, Vol.AC) Sec. 6, R-133: Expert parties engaged in visual and/or sampling checks for preparation of inventory of hazardous materials.

5) ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories.

4. Procedures and Instructions

4.1 The Service Supplier for visual and/or sampling checks for preparation of IHM shall establish the documented work and safety procedure including:

1) Survey preparation,
2) Safety procedures relevant to the hazards,
3) Selection and identification of visual and/or sampling check location,
4) Material preparation,
5) Sample removal,
6) Reinstatement of safe conditions for the material once the sample is taken,
7) Sample storage, identification and transport requirements, and
8) Report preparation and content.

4.2 For the testing laboratories shall comply with requirement in 5. and have procedures of test methods for the respective test items stated in the IMO IHM guidelines.

4.3 The Service Supplier for IHM maintenance shall provide IHM maintenance procedure or standard operating procedure, and if a software is used, the manual of the software shall be provided as well.

The IHM maintenance manual shall as a minimum contain the following information:

1) policy about how MD and/or SDOC is handled for spare parts of machinery and equipment,
2) minimum scope of items that require MD and/or SDOC,
3) policy if MD and/or SDOC cannot be received,
4) IHM maintenance change log for recording added, edited and deleted entries and how traceability is ensured, and
5) data storage for different versions of the IHM.

5. Equipment and Facilities

The Service Supplier should provide the detail of test laboratory. The test laboratory should be accredited or certified in accordance with ISO/IEC 17025 or recognized national or international standard and have ability to assess and test each of samples of hazardous material.

6. Analysis and Reporting

6.1 Development and reporting shall be based on Guidelines for the development of the inventory of hazardous materials Resolution IMO Res. MEPC. 269(68).

6.2 For preparation of IHM, the Service Supplier should have ability to obtain the result related with IMO Res. MEPC 269(68) Appendix 9, from the test laboratory.

6.3 The report shall be made and submitted in accordance with Guidelines for the development of the inventory of hazardous materials Resolution IMO Res. MEPC. 269(68).

7. Verification

The final report shall include the signature of supervisor's designated responsible person for verification purposes.

The Service Supplier shall have the BKI Surveyor's verification of each separate job, documented in the report by his signature.

V. Firms Engaged in Commissioning Testing of Ballast Water Management Systems (BWMS)

1. Extent of Engagement

This subsection applies to firms engaged in sampling and analysis of ballast water and verification of the self-monitoring equipment during commissioning testing of Ballast Water Management Systems (BWMS), for statutory purposes.

(IACS UR Z17 Annex 1 18.1)

2. Extent of Approval

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

(IACS UR Z17 Annex 1 18.2.2)

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

(IACS UR Z17 Annex 1 18.2.3)

3. Work Procedure

A documented work procedures required in A.2.8 are to include:

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

2) Operating procedures for the ballast water test equipment specified including calibration, adjustment and maintenance.

(IACS UR Z17 Annex 1 18.2.1)

4. Operators and Supervisors

4.1 Training

4.1.1 Operators performing sampling and analysis of ballast water shall:

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

— be trained in the proper use of detailed analysis methods and equipment in case the Service Supplier offers detailed analysis. Review of training records and/or interviews should be conducted to confirm the equipment will be properly used during testing;

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

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

— be trained in the proper disposal procedures for water samples following testing.

(IACS UR Z17 Annex 1 18.3)

4.1.2 Operators performing verification of the self-monitoring equipment are to have:

— knowledge of the system design limitations of the BWMS (as stated in the BWMS type approval certificate) and knowledge of the BWMS self-monitoring parameters, such as flow rate, pressure, TRO concentration, UV transmittance/intensity, etc, and how the BWMS notifies the operator in case he operates BWMS outside its system design limitations. This knowledge is relevant for evaluating whether the self-monitoring equipment of the BWMS indicates correct operation of the BWMS. In case Service Supplier are not present during ballasting operations, the Service Supplier shall have knowledge of how to access the BWMS log to evaluate that the BWMS operated correctly during ballasting operations;

— the procedures and knowledge to be able to assess the applicable self-monitoring parameters (e.g., flow rate, pressure, TRO, UV intensity, etc.) of the BWMS, taking into account the System Design Limitations of the BWMS.

(IACS UR Z17 Annex 1 18.3)

4.1.3 The Service Suppliers responsible for the carrying out of commissioning testing of BWMS are to maintain those up-to-date versions of the documents referred to in the following:

— IMO Resolution MEPC.300(72) - Code for Approval of Ballast Water Management Systems (BWMS Code)

— IMO Resolution MEPC.173(58) - Guidelines for Ballast Water Sampling (G2)

— IMO Circular BWM.2/Circ.42/Rev. 2 - Guidance on Ballast Water Sampling and Analysis for Trial Use in accordance with the BWM Convention and Guidelines (G2)

— IMO Circular BWM.2/Circ.70/Rev.1 - Guidance for the Commissioning Testing of Ballast Water Management Systems

— IMO Circular BWM.2/Circ.61 - Guidance on Methodologies that may be used for Enumerating Viable Organisms for Type Approval of Ballast Water Management Systems

— IMO Circular BWM.2/Circ.69 - Guidance on System Design Limitations of Ballast Water Management Systems and their Monitoring

— IMO Resolution A.1156(32) – Survey Guidelines under the Harmonized System of Survey and Certifications (HSSC), as amended (for BWMS that were Type Approved to the 2016 G8)

— Guidance for Marine Industry (Pt.1, Vol.AC) Sec.9, R-180 - Recommendation for conducting commissioning testing of Ballast Water Management Systems

(IACS UR Z17 Annex 1 18.7)

4.1.4 The documented training procedures specified in A.2.2 are to contain the followings:

1) Procedures to learn the knowledge specified in 4.1.3 above;

2) Procedures for the continuous education and training of the suppliers.

4.2 Qualifications

Operators carrying out commissioning tests are to:

— be able to perform both the biological sampling and assessment of self-monitoring parameters;

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

— have documented evidence of sufficient engineering and biological knowledge to conduct the commissioning testing.

(IACS UR Z17 Annex 1 18.3)

5. Equipment and Facilities

5.1 Equipment, procedures and methods for detailed analysis, where applicable, are to be in accordance with relevant International standard and/or accepted Industry standards.

(IACS UR Z17 Annex 1 18.4)

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

1) Equipment information - type, model, technology used, evidence of calibration, detection range, Organism type/size classes that can be analyzed.

2) Test results conduct for the verification of accuracy, detection range and repeatability.

3) Certificate of standards, if available.

(IACS UR Z17 Annex 1 18.4)

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

Note:

Each Service Supplier applicant will present the Surveyor their confidential internal procedures for conducting the indicative testing. Not all the equipment listed in the references will be used. For all equipment planned to be used, the instruction manuals shall be available. The Service Supplier will need to use specialty devices (e.g., sieves, screens, etc.) to separate the different organism sizes classes (i.e., ≥ 10 µm to < 50 µm, and ≥ 50 µm, and indicator microbes) to support analysis of each size class.

(IACS UR Z17 Annex 1 18.4)

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

(IACS UR Z17 Annex 1 18.4)

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

(IACS UR Z17 Annex 1 18.4)

6. Sampling and Analysis

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

(IACS UR Z17 Annex 1 18.5)

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

(IACS UR Z17 Annex 1 18.5)

6.3 Service Suppliers shall maintain a record of:

1) Operation of the BWMS during test period, including any recorded data or operator observations associated with the performance deviations, alarms or abnormal/unexpected operations.

2) Applicable self-monitoring parameters.

(IACS UR Z17 Annex 1 18.5)

6.4 In case the commissioning testing requires the Service Supplier's personnel to work in hazardous areas (e.g., pump room for tankers, etc.), the Service Supplier shall have equipment certified for use in such spaces.

(IACS UR Z17 Annex 1 18.5)

7. Reporting

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

— Manufacturer's name,

— Model name,

— BWMS Technology limiting operating conditions and system design limitations,

— BWMS treatment mode of operation, e.g., high power, low power, single pass, IMO mode, USCG Mode, etc.,

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

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

— Alarms developed during operation,

— Type Approval issued by and Certificate No,

— Results of Sample analysis,

— Pump and ballast tanks used for the commissioning test, including the flow rates and volumes of the ballasting and deballasting operations,

— Comments/Options: Filter and other major components, Process measurements.

(IACS UR Z17 Annex 1 18.6)

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