RULES FOR THE CLASSIFICATION AND CONSTRUCTION

PART 1. SEAGOING SHIPS

VOLUME XI
RULES FOR APPROVAL MANUFACTURERS AND SERVICE SUPPLIERS
2016 EDITIONS

BIRO KLASIFIKASI INDONESIA

RULES FOR THE CLASSIFICATION AND CONSTRUCTION

PART 1. SEAGOING SHIPS

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Foreword

This Rules are intended to approval of manufacturers and service suppliers engaged in classification and statutory services. In this edition there are a few changes and new amendments for service suppliers in which derived from IACS UR Z17.

The new amendments are formatted underline and vertical bold-line for amendments more than two pages.

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Rules Amendment Notice

These pages contain amendments within the following section of the Rules for Approval Manufacturers and Service Suppliers 2016 edition.

These amendments are effective from January 1st 2017

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
Section 1. General			
A.	**General**		
1.	**General**		
1.1	Rules Application	Redaction Amendment	
		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,.....	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 offshore installations,.....
2.	**Definition of Terms**	To add new definition of terms	
		-	2.6 "Manufacturers" 2.7 "Service Suppliers" 2.8 "Subcontractor" 2.7 "Agent" 2.8 "Subsidiary"
B.	**Assessment**		
4.	**Periodical Surveillance**	To add requirement of Periodical Surveillance	
		-	For service suppliers, periodical surveillance is to be carried out after 2 years but not 3 years passing from the initial or the renewal approval date.
5.	**Renewal Assessment**	To add requirement of renewal assessment falls outside the period of approval	
		-	Where for operational reasons, the renewal assessment falls outside the period of approval, the manufacturing works or 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.
6.	**Occasional Assessment**	To add requirement of Valid term of period of new certificate in case of amendment.	
		-	When amendment the certificate during occasional assessment, the validity period of new certificate will be dated as previous certificate.

Paragraph	Title/Subject	Status/Remarks	
		2014	2016
C.	**Approval**		
3.	**Valid Term of Approval Certificate**	Redaction Amendment	
		The valid term of an approval certificate is 5 years from the date of the initial or the renewal approval. In case where the renewal assessment is carried out within 3 months before the expiry date, the valid term of the certificate is 5 years from the expiry date.	The valid term of an approval certificate is <u>not exceeding</u> 5 years from the date of the initial or the renewal approval. In case where the renewal assessment is carried out within 3 months before the expiry date, the valid term of the approval <u>certificate will be dated to the original renewal date.</u>
		To add requirement of renewal of the certificate	
		-	For firms engaged in thickness measurements, renewal of the certificate is to be made at intervals not exceeding 3 years by verification that original conditions are maintained. In case where the renewal assessment is carried out within 3 months before the expiry date, the valid term of the certificate is 3 years from the expiry date.
D.	**Miscellaneous**		
1.	**Fees**	Redaction Amendment	
		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 four weeks after the date of invoice.	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 <u>the invoice but not later than 28 (twenty eight) calendar days. On default BKI entitled to withhold next assessment, certificate and others documents.</u>
Section 2. Requirements for Approval of Manufacturers			
D.	**Additional Requirements for Manufacturer of Mass Produced Products**		
1.2.1	**Document Examination**	Redaction Amendment	
		Manufacturing works is to submit 3 copies each of the following documents in addition to the documents specified in Section 1, B.3.1.	Manufacturing works is to submit three copies each of the following documents in addition to the documents specified in Section 1, B.3.1. <u>The documents may also be submitted in electronic version (soft copy)</u>
1.3.2	**Stamping or marking**	Redaction Amendment	
		The quality representative of the manufacturing works is	The quality representative of the manufacturing works is to identify

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
		to identify each mass produced product which has passed the examination in 1.3.1 by stamping or marking the serial number, the last date of examination and the BKI's stamp. For this purpose, BKI may entrust the quality representative with keeping the BKI's stamp beforehand.	each mass produced product which has passed the examination in 1.3.1 by stamping or marking the serial number, the last date of examination and the BKI's stamp.  For this purpose, BKI may entrust the quality representative with keeping the BKI's stamp  beforehand.
1.3.3	**Issuance Certificate**	Redaction Amendment	
		The quality representative of the manufacturing works is to submit a test report describing the serial number, the last date of examination, principal particulars and examination results on the mass produced product, which has passed the examination in 1.3.1, to the BKI Branch Office and further submitted to the Head Office. After checking the submitted examination report, the Head Office issues a certificate on each product to the manufacturing works.	The quality representative of the manufacturing works is to submit a test report describing the serial number, the last date of examination, principal particulars and examination results on the mass produced product, which has passed the examination in1.3.1, to the BKI Head Office and further submitted to the BKI Branch Office. After checking the submitted examination report, the Branch Office issues a certificate on each product to the manufacturing works.
2.2.2.1	**Trial run and overhaul inspection**	Redaction Amendment, to add reference source.	
		The trial run and the overhaul inspection are to be carried out under the test conditions as specified in the following a through e. In this case, reduction gears and flexible couplings to which 2.1.3 applies, as a standard, are to be subjected to the trial run after being assembled into the engine.	The trial run and the overhaul inspection are to be carried out under the test conditions as specified in the following a. through e. Furthermore, the Guidelines for Mass Produce Engines (Pt.1, Vol.K) Sec. 2 shall be observed. In this case, reduction gears and flexible couplings to which 2.1.3 applies, as a standard, are to be subjected to the trial run after being assembled into the engine.
2.2.2.1 b.	Testing Program	Redaction Amendment (in accordance with guidelines for mass produced engines (Pt.1, Vol.K)	
		- 1/4, 2/4, 3/4 and 9/10 partial load test 10 hours	- 1/4, 2/4, 3/4 and 9/10 partial load test 8 hours
2.2.2.1 c.	Examination after test	Redaction Amendment (in accordance with guidelines for mass produced engines (Pt.1, Vol.K)	
		-	The results of the component inspections are to be placed on record. Important parts are to be

Paragraph	Title/Subject	Status/Remarks	
		2014	2016
			photographed.
2.3.1	**Bench test on individual engines**	Redaction Amendment (in accordance with guidelines for mass produced engines (Pt.1, Vol.K)	
		-	The scope of bench tests are to comply with Guidance for Mass Produced Engines (Pt.1, Vol.K) Sect. 3.B.
5.2.1	**Approval Tests**	Redaction Amendment, To add reference source.	
		The approval tests are to be carried out on the electrical equipment randomly selected one for each frame number or type from the production line to verify that the equipment complies with the requirements in Rules for Electrical Installations, Volume IV, Section 20.	The approval tests are to be carried out on the electrical equipment randomly selected one for each frame number or type from the production line to verify that the equipment complies with the requirements in Rules for Electrical Installations (Pt.1, Vol.IV) Sect. 20 and 21.
9.	**Outboard Engines**	To add Requirement, To conform to the guidelines for mass produced engines (Pt.1, Vol.K)	
		-	The requirements for type approval test of outboard engine are in accordance with Guidance for Mass Produced Engines (Pt.1, Vol.K) Sect. 4.
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		-	c. Firms engaged in inspections and mainte-nance of self contained breathing apparatus e. Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships f. 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 h. Firms engaged in inspection, performance testing and maintenance of Automatic Identi-fication Systems (AIS)
1.1.1.2	**Classification and/or Statutory services**	To faciliate the IACS requirement	
		b. Firms carrying out in-water survey of ships -	b. Firms carrying out in-water survey of ships and mobile offshore units e. Firms engaged in measurements of noise level on board ships f. Firms engaged in examination

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
			of Ro-Ro ship's bow, stern, side and inner doors h. Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service
1.1.1.3.	**Application**	To facilities the requirement if BKI accepts work of a third party (e.g., service supplier) approved by itself.	
		-	Where BKI accepts work of a third party (e.g., service supplier) approved by itself, BKI shall verify the performance of such services. For statutory service, the scope of verification may be increased if there are additional requirements stipulated by flag Administration. The process shall be defined within BKI's quality management system. For the purpose of accountability to the flag Administration, the work performed by the third party (e.g., service supplier) constitutes the work of BKI and shall be subject to the requirements incumbent upon BKI under the RO Code IMO MSC.349(92) and MEPC.237(65).
1.1.2.	**Application**	Re-numbering arrangement of the subsection	
		Firms listed in 1.1.1.1 through 1.1.1.7 are to comply with the requirements in this Section as well as the requirements in Section 1.	Firms listed in 1.1.1.1 and 1.1.1.2 are to comply with the requirements in this Section as well as the requirements in Section 1.
1.1.3.	**Application**	To facilitate the IACS requirement	
		Firms listed in 1.1.1.8 are to comply with the requirements deemed appropriate by BKI as well as the requirements in Section 1.	Firms engaged in testing of coating systems are to comply with the requirements deemed appropriate by BKI as well as the requirements in Section 1.
1.1.4.	**Application**	To facilitate the IACS requirement	
		-	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. − Firms engaged in thickness measurements on ships − Firms carrying out in-water

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
			survey of ships and mobile offshore units − Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment
1.1.5.	**Application**	To facilitate the IACS requirement	
		-	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 organi-zations acting on behalf of the flag Administration, or − other organizations those are acceptable to the flag Administration (e.g. other governments, etc.).
1.1.6.	**Application**	To facilitate the IACS requirement	
		-	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

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
			Ro-Ro ships bow, stern, side and inner doors
2.3.2.	**Record of equipment used**	To facilitate the IACS requirement	
		-	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.
3.	**Control of data**	To facilitate the IACS requirement	
		-	When computers are used for the acquisition, processing, recording, re-porting, storage, measure-ment assessment and monitoring of data, the ability of computer software to satisfy the intended application shall be documented and confirmed by the service supplier. This shall be undertaken prior to initial use and reconfirmed as necessary. ***Note:*** *Commercial off-the-shelf software (e.g. word-processing, database and statistical programmes) in general use within their designed application range may be considered to be sufficiently validated and do not require any subsequent confirmation.*
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4.4.	**Demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
C.	Firms Carrying Out In-Water Survey of Ships <u>and Mobile Offshore Units</u>	To Facilitate that the requirement can be applied for mobile offshore units.	
		Firms Carrying Out In-Water Survey of Ships	Firms Carrying Out In-Water Survey of Ships <u>and Mobile Offshore Units</u>
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Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
		1.1.2 Guidance to divers along the hull parts to be surveyed. 1.1.5 Reporting the results of the survey and the verification by BKI's surveyor.	**1.1.5** Reporting the results of the inspection and the verification by BKI's surveyor.
2.2.1	**Qualification**	To facilitate the IACS requirement	
		Divers carrying out In-Water survey are to have had at least 1 years' experience and 10 different assignments as an assistant diver.	Divers carrying out inspection are to have had at least 1 years' experience and 10 different assignments as an assistant diver.
2.2.2	**Qualification**	To facilitate the IACS requirement	
		-	The 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.
4.3	**Demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dis-pensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
D.	**Firms Engaged in Servicing and Testing of Radio Communication Equipment**		
2.1.1.5	**Training**	To facilitate the IACS requirement	
		-	MSC.1/Circ.1252 Guidelines on Annual Testing of the Automatic Identification System (AIS)
4.	**Demonstration**	To facilitate the IACS requirement	
		-	**4.2** In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with. **4.3** For renewal assess-ment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
E.	**Firms Engaged in Performance Tests of Voyage Data Recorders (VDRs)**		
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4	**Demonstration**	To facilitate the IACS requirement	
		-	**4.2** In case where the supplier has been approved by other

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
			classification societies, a part of or the whole of the demonstration may be dispensed with. **4.3** For renewal assess-ment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
F.	To add requirements related to Firms engaged in inspection, performance testing and maintenance of Automatic Identification Systems (AIS)		
		To facilitate the IACS requirement	
		-	F. Firms engaged in inspection, performance testing and maintenance of Automatic Identifi-cation Systems (AIS)
G.	**Firms Engaged in Services of Fire Fighting Equipment and Systems**		
5.3	**Renewal assessment of demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
H.	**Firms Engaged in Services of Fire Fighting Equipment and Systems**		
5.3	**Renewal assessment of demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
I.	**Firms Engaged in Tightness Testing of Hatches with Ultrasonic Equipment**		
4.3	**Renewal assessment of demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
J.	**Firms Engaged in Tightness Testing of Hatches with Ultrasonic Equipment**		
2.	**Initial assessment**	To facilitate the IACS requirement	
		a. Detailed list of the Laboratory test equipment for the IMO Resolution MSC.215 (82) as may be amended coating approval.	a. Detailed list of the Laboratory test equipment for the IMO Resolution MSC.215 (82) <u>or MSC.288(87)</u> as may be amended coating approval. b. Detailed list of reference

Paragraph	Title/Subject	Status/Remarks	
		2014	**2016**
		b. Detailed list of reference documents comprising a minimum those referred to in MSC.215(82) or MSC.288(87) as may be amended that are available in the laboratory.	documents comprising a minimum those referred to in MSC.215(82) or MSC.288(87) as may be amended that are available in the laboratory.
3.1.1	**Training**	To facilitate the IACS requirement	
		MSC.215(82) as may be amended.	MSC.215(82) or MSC.288 (87) as may be amended
4.2	**Equipment for Testing of Coating Systems**	To facilitate the IACS requirement	
		-	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
5.3	**Renewal assessment of demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
K.	**Renewal assessment of demonstration**	To facilitate the IACS requirement	
		-	For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.
L.	To add requirements related to Firms Engaged in Inspections and Maintenance of Self Contained Breathing Apparatus		
		To facilitate the IACS requirement	
		-	Firms Engaged in Inspec-tions and Maintenance of Self Contained Breathing Apparatus
M.	To add requirements related to Firms engaged in examination of Ro-Ro ships bow, stern, side and inner doors		
		To facilitate the IACS requirement	
		-	Firms engaged in exami-nation of Ro-Ro ships bow, stern, side and inner doors

Paragraph	Title/Subject	Status/Remarks	
		2014	2016
N.	To add requirements related to 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		
		To facilitate the IACS requirement	
		-	Firms engaged in inspect-ions of low location lighting systems using photo lumi-nescent materials and evacuation guidance sys-tems used as an alternative to low-location lighting systems
O.	To add requirements related to Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships		
		To facilitate the IACS requirement	
		-	Firms engaged in sound pressure level measure-ments of public address and general alarm systems on board ships
P.	To add requirements related to Firms Engaged in Measurements of Noise Level Onboard Ships		
		To facilitate the IACS requirement	
		-	Firms Engaged in Measurements of Noise Level Onboard Ships
Q.	To add requirements related to Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service		
		To facilitate the IACS requirement	
		-	Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service

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 offshore installations, 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.

1.6 Where several service station are owned by a service supplier, each service station is to be assessed and approved except a service supplier have implemented a quality system certified in accordance with the most current version of ISO 9000 series with effective controls.

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 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 offshore installation unit such as measurements, tests or maintenance of safety systems and equipment, the results of which are used by surveyors in making decisions affecting classification or statutory certifications and services.

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 service supplier.

2.9 "Agent" means 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. Assessment

1. General

1. 1 In case a manufacturer or a service supplier intends to obtain approval or maintain approval as a manufacturer or a service supplier under the Rules, the manufacturing works or the service supplier is to be assessed by BKI in accordance with the requirements of this Section.

1. 2 In such assessment of a manufacturing works or a service supplier, an investigation on the quality system, production or service procedures, production or service facilities, operators, etc. and, an approval test or a demonstration where necessary, are carried out, and comprehensive evaluation is made.

1.3 Where the following sections refer to both ISO and EN standards and if, where they are both specified, the standards are not identical, the ISO standards shall take precedence. Where the two standards are identical, either the ISO or the EN standard may be used.

2. Kinds of Assessment

The kinds of assessment are initial assessment, periodical surveillance, renewal assessment and occasional assessment.

3. Initial Assessment

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

3.1 Document examination

3.1.1 For manufacturing works of product intended to be approved under the Rules, three copies each of the following documents are to be submitted to BKI for the document examination. The documents may also be submitted in electronic version (soft copy).

a. Outline of the works intended to be approved (location, history, organization diagram, number of employees, main products, standard production output, etc.).

b. Manufacturing facilities (a summary of main manufacturing facilities, testing and inspection equipment, outline of workshops and facilities for storing materials and parts, a list of orders to the subcontractors and the subcontracted products, etc.).

c. Outline of the products.

d. Quality manual and its supplementary documents.

e. Quality plan for each product.

f. Any other data deemed necessary by BKI.

3.1.2 For service suppliers intended to be approved under the Rules, three copies each of the following documents are to be submitted to BKI for the document examination. The documents may also be submitted in electronic version (soft copy).

a. Outline of the firms intended to be approved (location, history, organization diagram, number of employees, main services and their actual records, etc.)

b. Description of equipment used for the service (measuring equipment, outline of workshops and facilities for storing materials and parts, a list of orders to the subcontractors, etc.)

c. Outline (including description of service conditions or service regions) of the relevant service

d. 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.)

e. List of operators documenting name, qualifications, training and experience within the relevant service area, and training programmers for operators

f. Checklists of the relevant services and reporting formats to BKI

g. Copies of approval certificates issued by competent organizations or other classification societies, if any.

h. Other documents deemed necessary by the BKI.

3.1.3 In the document examination, the documents submitted under the requirement in 3.1.1 or 3.1.2 above are reviewed to confirm that the documented quality system is in conformity with the Rules.

3.2 Field examination

3.2.1 In the field examination, based on the documents that have been submitted and reviewed, the quality system, etc. of the manufacturing works or the service supplier is investigated on site to confirm that the quality system, etc. is in conformity with the Rules.

3.2.2 For manufacturing works to which Section 2.D of the Rules applies, approval tests on the products intended to be approved are to be carried out with satisfactory results.

3.2.3 For service suppliers to which Section 3 of the Rules applies, demonstrations of the service performances intended to be approved are to be carried out with satisfactory results.

4. Periodical Surveillance

4. 1 Periodical surveillance is carried out to the approved manufacturing works or service supplier.

4. 2 In the periodical surveillance, it is confirmed by BKI that the approved quality system, etc. of the manufacturing works or service supplier are maintained satisfactorily.

4. 3 The date of periodical surveillance is to be as follows:

4.3.1 For manufacturing works of products, periodical surveillance is to be carried out within 3 months either way of each anniversary date (the day corresponding to the expiry date of the certificate).

4.3.2 For service suppliers, periodical surveillance is to be carried out after 2 years but not 3 years passing from the initial or the renewal approval date.

5. Renewal Assessment

5.1 Renewal assessment is to be carried out to the approved manufacturing works or service supplier by the expiry date of the approval certificate as specified in C.3, in case where the manufacturer's or supplier's management intends renewal of the approval.

5.2 In the renewal assessment, assessment is made in accordance with the requirements for the initial assessment specified in 3 above. However, if BKI considers acceptable, the assessment may be modified.

5.3 Where for operational reasons, the renewal assessment falls outside the period of approval, the manufacturing works or 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.

6. Occasional Assessment

6. 1 Occasional assessment is carried out to the approved manufacturing works or service supplier as the occasion demands, in case the manufacturer's or supplier's management intends to make alternations and some change in the approved contents at a time other than that of periodical surveillance or renewal assessment.

6. 2 In the occasional assessment, it is confirmed by BKI that all the necessary items are in a satisfactory condition.

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

7. Preparations for Assessment or Surveillance, and Others

7. 1 All such preparations as required for assessment or surveillance specified in 3 through 6 are to be made by the manufacturing works or the service suppliers. On such occasions, the management representative as specified in Section 2, B.2.1.2, for the manufacturing works or the person familiar with the quality system for the service suppliers is also to be present at the assessment or the surveillance.

7. 2 In case necessary preparations have not been made or in case no responsible person specified in 7.1 above is present at the assessment or the surveillance, BKI may suspend the assessment or the surveillance.

7. 3 As a result of assessment or surveillance, in case rectification is considered necessary, BKI will notify the management accordingly. The manufacturer's or supplier's management who has received such notification is to perform corrective actions subject to confirmation by BKI.

C. Approval

1. Issuance of Approval Certificates and Official Announcement

1. 1 As a result of initial assessment or renewal assessment, if the quality system, etc. of a manufacturing works or a service supplier is found in conformity with the Rules, the manufacturing works or

the service supplier is approved and an approval certificate be issued to the manufacturer's or supplier's management.

1.2 BKI officially announces a list of the approved manufacturing works and service suppliers.

2. Issuance of Assessment Record

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

3. Valid Term of Approval Certificates

The valid term of an approval certificate is not exceeding 5 years from the date of the initial or the renewal approval. 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.

For firms engaged in thickness measurements, renewal of the certificate is to be made at intervals not exceeding 3 years by verification that original conditions are maintained. In case where the renewal assessment is carried out within 3 months before the expiry date, the valid term of the certificate is 3 years from the expiry date.

4. Cancellation of Approval.

In case an approved manufacturing works or service supplier falls under one of the following items 4.1 through 4.5, BKI may cancel the approval Upon such a cancellation, BKI notifies the manufacturer's or supplier's management accordingly.

4. 1 In case where a quality of the products or a result of the services is in doubt.

4. 2 In spite of request from BKI for rectification, in case appropriate corrective actions have not been taken by the date designated by BKI.

4. 3 In case where the approved condition has not complied with the technical requirements concerned due to alteration of the requirements.

4. 4 In case assessment or surveillance specified for in B.4 and B.6 is not carried out.

4. 5 In case the manufacturer's or supplier's management proposes to cancel application to the Rules.

D. 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 endeavors 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.

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Section 2

Requirements for Approval of Manufacturers

A. General Rules

1. General

1. 1 Application

1.1.1 This Section applies to manufacturing works of products.

1.1.2 Manufacturing works are to comply with the requirements in this Section as well as the requirements in Section 1.

1. 2 Facilities and Personnel of the Works

1.2.1 The works is to be provided with necessary manufacturing facilities to secure quality required of the products. Appropriate environmental facilities, carrying appliances, etc. are to be maintained in workshops, also.

1.2.2 In the works, necessary inspection and test equipment together with its supplementary equipment to thoroughly perform the inspection and tests of the products are to be maintained.

1.2.3 In the works, the assignment of personnel is to be appropriate to maintain the quality required of the products.

1. 3 Equivalency

Even in case it is difficult to conform to the requirements in this Section, if BKI admits a matter as equivalent to the requirements in this Section, the matter may be regarded as conforming to this Section.

B. Establishment of Quality System

1. General

To maintain quality required of the products, the manufacturer's management is to clearly define its policy and objectives for, and commitment to the quality and is to establish and maintain a quality system that is in conformity with the requirements in 2. and C. hereunder. The manufacturer's management is to also prepare a documented quality manual indicating the procedures for implementing the above established quality system.

2. Organization and its Functions

2.1 Responsibility and Authority

2.1.1 The manufacturer's management is to clearly define the responsibility, authority and the inter-relation of all personnel who manage, perform and verify work affecting quality of the products. In particular, it is necessary to clearly define the above for the persons who take charge of the tasks related to the testing and inspection required by the Rules of BKI.

2.1.2 The manufacturer's management is to appoint a person responsible for quality management (hereinafter referred to as a "management representative"). The management representative is to have the

organizational responsibility and authority necessary to perform and maintain the quality system, not having anything to do with any responsibility for other sections. The management representative is also to have authority to stop production in case a serious quality problem arises with the products.

2.2 Verification Resources

2.2.1 The manufacturer's management is to verify the quality of the products by inspection, testing, etc. For this purpose, if necessary, persons who are not affected by the production groups shall be assigned and these persons are to be under control of the management representative.

2.2.2 The manufacturer's management or the person authorized by him is periodically to perform the internal quality audits. As to the results of such audits, the following a. to c. are to be ensured.

a. The audit results are to be reported to the manufacturer's management and departments.

b. Based on the audit results, the manufacturer's management is to review the quality system when necessary.

c. The audit results and the records of review of the quality system are all to be maintained.

C. Quality System Requirements

1. General

The manufacturer's management is, to secure quality required of the products, to establish and maintain an appropriate quality control method in accordance with the requirements in subsection B and this subsection.

2. Quality System Elements

2.1 Contract Review

2.1.1 Upon receiving an order, the contents of the order received are to be thoroughly reviewed, confirmed and adjusted, and the results are to be notified properly to the related sections.

2.1.2 In review of the contents of an order received, compatibility with the Rules of BKI is to be confirmed concerning construction, testing and inspection, etc. of the products.

2.2 Design Control

2.2.1 Requirements to be input for designing the products are to be clearly defined.

2.2.2 Personnel functions competent to verify the design are to be established and the design output is to be verified to meet all of the design input requirements.

2.2.3 The design is to be approved by BKI in case conformity with the Rules of BKI is necessary.

2.2.4 Alternations and amendments to the design are to be made appropriately and to be notified promptly to the related sections.

2.3 Document Control

2.3.1 Procedures for issuing, altering, abolishing, approval, distribution, etc. of the documents (quality manual, technical standards, design and manufacturing drawings, specifications, production procedures, etc.) are to be established and maintained appropriately.

2.3.2 The documents are to be controlled so that only the latest editions are available and necessary

documents for surveys are to be easily presented at the request of the Surveyor.

2.4 Purchased and Subcontracted Products Control

2.4.1 Supplier's and subcontractor's works are to be thoroughly examined and evaluated on their quality control to verify that the purchased and subcontracted products are produced in a way that satisfies the specified requirements of the orders. BKI may examine the supplier's and subcontractor's works if necessary. However, in case purchased and subcontracted products are made subject to survey by the BKI and supplied together with the product certificates issued by BKI, the above examination may be dispensed with for such suppliers and subcontractors.

2.4.2 In purchasing documents to suppliers and subcontractors, the following are to be included as the occasion demands:

a. Specifications of the article (including technical data)

b. Names and numbers of documents such as drawings applied to the article

c. Manufacturing methods procedures, installations and the personnel qualifications to be required

d. Manufacturing processes and inspection and testing method of the articles

e. Whether it is necessary or not to conform to the Rules of BKI

f. Disposal method for nonconforming articles

g. Requirements for identification of articles

h. Requirements for storage, packaging and shipment of the articles

i. Requirements for maintenance and presentation of quality records.

2.4.3 Concerning handling, storage, maintenance and others of purchased and subcontracted products after receipt, proper control is to be exercised.

2.4.4 Purchaser supplied articles to be incorporated into the products are to be properly verified, stored and maintained.

2.5 Identification of Products

The products and their important parts and materials are to be identified so that they can be traceable to the related documents such as drawings, specifications, etc. of the product during the whole process.

2.6 Production Process Control

2.6.1 In processes affecting quality of the products, the work is to be carried out in accordance with the appropriate quality plans, work instructions, and others. These quality plans, work instructions and others shall be capable of assuring the quality required of the products.

2.6.2 The processes in 2.6.1 above are to be under controlled conditions as appropriate.

2.6.3 In case of welding or heat treatment is carried out to the products, the following are to be satisfied as applicable:

a. The procedures for welding or heat treatment to the products are to be approved by BKI.

b. The welders are to have the qualification as a welding operator approved by the BKI depending on the materials, welding procedures, etc.

2.6.4 Manufacturing methods of the products are to be approved otherwise by BKI, if required under the Rules of BKI.

2.6.5 Maintenance and inspection for manufacturing facilities is to be carried out appropriately.

2.7 Inspection and Testing Control

2.7.1 Receiving inspection and testing

Purchased and subcontracted products are to be inspected or otherwise verified to conform to the requirements specified at the time of orders, before they are used or processed.

2.7.2 In-process inspection and testing

.1 Inspection, tests and identification of the products are to be carried out appropriately during the processes. The inspection and tests during the process are especially to include all items that cannot be verified by the subsequent inspection and testing.

.2 The product is to be held in principle until the specified inspection and tests have been completed and the quality of the product been verified.

2.7.3 Final inspection and testing

The final inspection and tests are to be carried out to verify that the completed product is in conformity with the specified requirements. On such an occasion, it is to be confirmed that the results of specified inspection, tests, etc. in receiving and in-process inspection and testing have all been acceptable, too.

2.7.4 Inspection and testing required by the Rules of the BKI

.**1** In in-process and final inspection and testing of the products, all inspection and tests required by the Rules of BKI are to be included, and the inspection and testing methods as well as the evaluation criteria are subject to approval of BKI. The results of such inspection and tests are also to be confirmed by the Surveyors of BKI. On these occasions the Surveyors will be present at the inspection and tests considered necessary by BKI.

.2 Necessary preparations are to be made for the inspection or tests as specified in .1 above, in case the Surveyor of BKI is present. On such an occasion, personnel who has full knowledge of the inspection or tests and can supervise these preparations is also to be present at the inspection or tests.

.3 In case non-destructive inspection is required by the Rules of BKI, the operator is to have a qualification considered appropriate by BKI.

2.8 Control of Inspection, Testing and Measuring Equipment

2.8.1 Inspection, testing and measuring equipment which can affect quality of the products, is to be properly selected and controlled. These equipments are to be calibrated to the appropriate standards.

2.8.2 The standard is to be traceable to the national standard or an equivalent standard.

2.9 Control of Nonconforming Products

2.9.1 Control of nonconforming products

To prevent use of products which do not conform to the specified requirements, the nonconforming products in receiving, in-process and final inspection and testing are to be properly identified, recorded, evaluated, segregated and disposed of, of which at the same time are to be notified to the relevant sections.

2.9.2 Nonconformity review and disposition

In case the following measures are taken with nonconforming products, the methods as well as the authority and the responsibility for such measures are to be clearly defined subject to approval by BKI, if necessary.

a. In case they are reworked or repaired to meet the specified requirements.

b. In case they are accepted without repair by concession.

c. In case they are re-graded for alternative applications.

d. In case they are rejected or scrapped.

2.9.3 Corrective actions

Investigation and study of the cause of nonconforming products are to be thoroughly made, and the corrective actions are to be taken to prevent recurrence.

2.10 Quality Records

Quality records for the results in receiving, in-process and final inspection and testing, the disposition of non-conforming products, etc. are to be identifiable to the products involved and are to be kept in order, maintained and stored in such a way that they can be readily retrieval. In such records, the quality records for purchased and subcontracted products are also to be included.

2.11 Control of Handling, Storage, Packing and Delivery of Products

To prevent damage, staining, deterioration or misapplication of the products, handling, storage, packaging and shipment of the products are to be properly controlled.

2.12 Training

All personnel who are engaged in the activities which can affect quality of the products are to be properly trained. On such occasion, for persons who are engaged in specific assigned tasks such as welding, non-destructive inspection, etc., special consideration is to be given to maintaining and improving their abilities through recognition of qualifications etc.

2.13 Servicing

2.13.1 In case assembly, installation, trial, etc. are required after shipping the products out of the works, each requirement in this Section, as the occasion demands, is to correspondingly apply.

2.13.2 If necessary, informative instructions concerning technical data, handling, maintenance, repairs, etc. of the products are to be presented to users.

2.13.3 Customer complaints concerning problems in using the products are to be collected and analyzed and appropriate counter-measures are to be taken as the occasion demands.

2.14 Statistical Technique

To maintain quality of the products, an appropriate statistical technique is to be adopted when necessary.

2.15 Improvement of Quality

The manufacturer’s management is to take the necessary steps to realize stable and improved quality of the products.

D. Additional Requirements for Manufacturer of Mass Produced Products

1. General

1.1 Scope

1.1.1 This section applies to approval assessment of machinery and equipment, which are manufactured by a production system (hereinafter referred to as "mass produced products"), intended to be examined and certified in accordance with a procedure suited to their production method.

1.1.2 Manufacturing works of mass produced products are to comply with the requirements in this section as well as the requirements in Section 1, and A., B. and C. of this Section.

1.2 Initial Assessment

1.2.1 Document examination

Manufacturing works is to submit three copies each of the following documents in addition to the documents specified in Section 1, B.3.1. The documents may also be submitted in electronic version (soft copy).

a. Data showing the principal particulars and specification of mass produced products, and sectional assembly drawings and drawings of major components

b. Production records covering the last 2 years

c. For mass produced products of novel design, documents showing the tests with their results for research and development

1.2.2 Approval tests

1.2.2.1 The approval tests on the mass produced products deemed necessary by BKI are to be carried out in the presence of BKI's surveyor. The approval test procedures are to be in accordance with the requirements of 2. through 9. for each kind of the product. However, modification or omission of the tests may be accepted in consideration of the service records of the products and their construction or function.

1.2.2.2 When the approval test is completed, manufacturing works is to submit 2 copies of the test result to BKI.

1.3 Subsequent to the Approval

1.3.1 Manufacturing and examination

The manufacturing works is to manufacture (including purchase and subcontract control, process control, measuring equipment control, etc.) and examine the mass produced products in accordance with the quality system approved by the BKI.

1.3.2 Stamping or marking

The quality representative of the manufacturing works is to identify each mass produced product which has passed the examination in 1.3.1 by stamping or marking the serial number, the last date of examination and the BKI's identification number and stamp  . For this purpose, BKI may entrust the quality representative with keeping the BKI's stamp  beforehand.

1.3.3 Issuance of certificate

The quality representative of the manufacturing works is to submit a test report describing the serial number, the last date of examination, principal particulars and examination results on the mass produced product, which

has passed the examination in 1.3.1, to the BKI Head Office and further submitted to the BKI Branch Office. After checking the submitted examination report, the Branch Office issues a certificate on each product to the manufacturing works.

1.3.4 Major Components

In case where major components are delivered by themselves, the components may be dealt with by 1.3.1 through 1.3.3 provided that the components are manufactured and examined under the same quality system of the completed products.

1.3.5 Alteration of the approved products

In case where a type, a specification, etc. of the approved mass produced product is altered, occasional assessment specified in Section 1, B.6 is to be carried out.

2. Diesel Engines

2.1 General

2.1.1 Scope

.1 The requirements in 2., in general, apply to diesel engines having a cylinder bore not exceeding 300 mm manufactured at the same manufacturing works.

.2 The requirements specifically prescribed in 2. supersede those specified in 1.

2.1.2 Definitions

.1 Mass produced diesel engines to which this 2. applies are supposed to be manufactured in accordance with a. through e. below:

a. Those mass produced under the strict quality control on materials and parts in accordance with the program agreed by BKI

b. Those manufactured through the use of jigs or automatic machines designed to machine parts to close tolerances for interchangeability, and which are to be verified on a regular inspection basis.

c. Those parts taken from the stock after manufacture requiring little or no manual adjustments or finishing work in the assembly process.

d. Those subjected to a trial run at the manufacturer for individual engines under the established testing program.

e. When engines selected at random are subjected to detailed tests for performance evaluation after completion of the trial run at the manufacturer specified in the d. above.

.2 The major components referred to in 2. are as follows:

Cylinder cover, cylinder liner, piston, piston pin, connecting rod, cylinder block, bed plate, crankshaft, cam, camshaft, camshaft driving gears, bearing (top and bottom bearings of connecting rod, main bearing), bolt (small end bolt and big end bolt of connecting rod, tension bolt, main bearing bolt, coupling bolt), pumps attached to engine (lubricating oil, cooling water, fuel oil), piping's attached to engine (starting air system, fuel injection system), coolers attached to engine (lubricating oil, cooling water, supercharged air), exhaust gas turbocharger, reduction gear, power transmission shaft and flexible coupling.

2.1.3 Equivalency

The major components produced by subcontractors who undergo the quality system of the manufacturing works or give full information about their quality control may be dealt with by 2., when deemed appropriate

by BKI.

2.2 Initial Assessment

2.2.1 Field examination

In the field examination, it is confirmed that the manufacturing facilities and overall quality system of the manufacturing works are satisfactory, and in addition, the quality of major components are verified satisfactory. The verifications are to be made either by random sampling during the manufacturing process, by checking the examination records or by overhaul inspection after the trial run of the engine.

2.2.2 Approval tests

.1 Trial run and overhaul inspection

The trial run and the overhaul inspection are to be carried out under the test conditions as specified in the following a. through e. Furthermore, the Guidelines for Mass Produce Engines (Pt.1, Vol.K) Sec. 2 shall be observed. In this case, reduction gears and flexible couplings to which 2.1.3 applies, as a standard, are to be subjected to the trial run after being assembled into the engine.

a. Selection of test engine

One set of test engine is to be selected from the production line.

b. Testing program

The testing program is, in principle, to be as follows:

- Maximum continuous output test 80 hours
- 110% overload test 8 hours
- 1/4, 2/4 and 3/4 partial load test 8 hours
- Intermittent load test 2 hours
- Starting test
- Reverse running test (direct reversing engine only)
- Performance test of over speed protection device
- Performance test of low L.O. pressure alarm and automatic stopping system
- Exhaust gas turbocharger out of action test
- Minimum speed test (main engine only)
- Idling speed test (auxiliary engine only)

The tests at the above-mentioned outputs are to be combined together in working cycle which are to be repeated subsequently with the whole duration within the limits indicated.

The overload is to be alternately carried out with followings:

- 110% output and 100% rpm of the maximum continuous output
- 110% output and 103% rpm of the maximum continuous output

c. Condition of tests

The following items are to be recorded at time of test:

– Ambient air temperature
– Ambient air pressure
– Atmospheric humidity
– External cooling water temperature
– Fuel and lubricating oil characteristics

d. Measurements and records

The following values of measurement are to be recorded at test:

– Rotational speed of engine
– Brake horsepower
– Torque
– Maximum combustion pressure
– Indicated pressure diagrams (if practicable)
– Exhaust smoke
– Lubricating oil pressure and temperature
– Exhaust gas temperature in exhaust manifold
– Cooling water pressure and temperature (for each cylinder, if practicable)

The following items are to be added for engines with a turbocharger.

– Rotational speed of exhaust gas turbocharger
– Air temperature and pressure before and after air cooler
– Exhaust gas temperature and pressure before and after exhaust gas turbocharger
– Cooling water temperature at cooler inlet

e. Examination after test

After testing, overhaul inspection is to be carried out on main parts.

The results of the component inspections are to be placed on record. Major components are to be photographed.

Notes:

1. *For engines that are to be approved for different purpose (multipurpose engines), and that have different performance for each purpose. The program and duration of test will be modified to cover the whole range of the engine performance taking into account the most severe values.*
2. *The maximum continuous output for which the engine is to be tested is the output corresponding to that declared by the manufacturer and agreed by the BKI, i.e. actual maximum power which the engine is capable of delivering continuously between the normal maintenance intervals stated by the manufacturer at speed and under the stated ambient conditions.*

.2 Additional tests

Notwithstanding the requirements of 2.2.2.1, tests such as torsional vibration measurement considered necessary may be additionally required for the engine, and special tests may be carried out for reduction gears, flexible couplings and turbochargers.

2.3 Subsequent to the Approval

2.3.1 Bench test on individual engines

Notwithstanding the requirements in 1.3.1, BKI's surveyor may attend a bench test on individual engines in case where the number of production of the engine is small.

The scope of bench tests are to comply with Guidance for Mass Produced Engines (Pt.1, Vol.K) Sect. 3.B.

2.3.2 Test report

The test report required in 1.3.3 is to be made for each engine and is to state the following items. However, no entry may be made on components in e. when BKI's surveyor considers it unnecessary.

a. Intended service

b. Serial No. of engine

c. Type of engine

d. Principal particulars (maximum continuous output and rpm, normal and reversing rating, number of cylinders, cylinder bore, piston stroke, indicated mean effective pressure, brake mean effective pressure, maximum pressure in cylinder, etc.)

e. Date of the inspection and inspection records on the major components (material inspection, finishing inspection, hydrostatic test, welding inspection and others)

f. Records of the bench test.

3. Purifiers

3.1 General

3.1.1 Scope

.1 The requirements in this 3., in general, apply to centrifugal cylinder type or centrifugal disc type fuel oil or lubricating oil purifiers (hereinafter referred to as the "purifier") manufactured at the same manufacturing works.

.2 The requirements in this 3. are not applicable to the driving electric motors and their accessories.

.3 The requirements specifically prescribed in this 3 supersede those specified in 1.

3.1.2 Definitions

The major components referred to in this 3. are as follows:

a Cylinder type

Frame, bowl, cover, safety device, attached pump

b Disc type

Frame, bowl, vertical spindle, horizontal spindle, main gear, safety device, attached pump

3.2 Initial Assessment

3.2.1 Approval Tests

The approval tests are to be carried out on the purifier randomly selected one for each type from the production line. The items of the approval tests are, in general, to be as follows:

a. Manufacturing inspection

b. Leakage test and pressure test

c. Operational performance test

- Starting test
- Stopping test
- Performance test
- Over-speed test
- Continuous running test
- Operation test of accessories

d. Overhaul inspection

e. Other tests as deemed necessary by BKI

4. Hydraulic Motors and Hydraulic Pumps

4.1 General

4.1.1 Scope

The requirements in this 4., in general, apply to hydraulic motors and hydraulic pumps, intended for steering gears, windlasses, cargo winches and other deck machinery, opening/closing appliances of watertight doors, side thrusters, and other auxiliaries for essential use, manufactured at the same manufacturing works.

The requirements specifically prescribed in this 4. supersede those specified in 1.

4.1.2 Definitions

The major components referred to in this 4. are as follows:

a. Hydraulic motors and hydraulic pumps to which 4 applies are those of the gear type, screw type, vane type and piston type.

b. The major components referred to in 4 are as follows:

- Gear type and screw type:

  Casing, cover, gear, screw, shaft, bearing and relief valve

- Vane type:

  Casing, cover, vane, rotor, bush, cam ring, driving shaft, bearing and relief valve

- Axial piston type:

  Driving shaft, bearing piston, rod, cylinder block, valve plate, cam plate, pump casing, bearing casing, cover, flexible shaft coupling, controller and servo system

- Radial piston type:

  Driving shaft, crankshaft, bearing, piston, rod, side guide, cam curve, pump casting, slide block, cylinder casting, cover, relief valve and servo system

4.2 Initial Assessment

4.2.1 Approval Tests

1. The approval tests are to be carried out on the hydraulic motor and hydraulic pump randomly selected one for each type from the production line.

2. The items of the approval tests are, in general, to be as follows:

a. Examination of construction

b. Pressure test

c. Operational performance test

- Performance test
- Continuous test
- Operation test of relief valve

d. Overhaul inspection

e. Other tests considered necessary by BKI

5. Electrical Equipment

5.1 General

5.1.1 Scope

The following requirements apply to electrical equipment manufactured at the same manufacturing work.

.1 The requirements in this 5. may apply to electrical equipment small in production number but has a sufficient past production record.

.2 The requirements in this 5. may apply to electrical equipment of novel design provided that the equipment is ensured, by thorough development tests, to have enough reliability equivalents to that of equipment having a sufficient past production record.

.3 The requirements specifically prescribed in this 5. supersede those specified in 1.

5.2 Initial Assessment

5.2.1 Approval tests

.1 The approval tests are to be carried out on the electrical equipment randomly selected one for each frame number or type from the production line to verify that the equipment complies with the requirements in Rules for Electrical Installations (Pt.1, Vol.IV) Sect. 20 and 21.

.2 The items of the approval tests are, in general, to be as follows. However, additional test items or number of test samples may be required in case where BKI specifically deems necessary.

a. Generators

- Construction inspection
- Running test:

  Temperature test, overload test, over current test, short circuit test, commutation test, over speed test.

– Characteristics test:

Voltage regulation characteristics test, instantaneous voltage regulation characteristics test

– Insulation resistance test

– High voltage test

– Vibration measurement, noise level measurement, and hydraulic test for air cooler

b. Electric motors

– Construction inspection

– Operational test:

Temperature test, overload test, over torque test, commutation test and over speed test

– Characteristics test:

Load characteristics test

– Insulation resistance test

– High voltage test

c. Control gears for electric motors

– Construction inspection

– Temperature test

– Operational test (including circuit inspection)

– Insulation resistance test

– High voltage test

d. Power and lighting transformer

– Construction inspection

– Temperature test

– Insulation resistance test

– High voltage test

– Induced high voltage test

e. Switchboards

– Construction inspection

– Temperature test

– Operational test (for main circuits)

– Insulation resistance test

– High voltage test

f. Axial flow fan driven by motor built in casing

– Construction inspection

– Combined running tests:

Temperature test, air flow and static air pressure measurements, shaft power measurements, vibration and noise level measurements

- Insulation resistance test
- High voltage test

Notes:

1. Testing and inspection procedures are to be in accordance with the requirements of IEC, JIS, or other standards or codes as deemed appropriate by BKI.

2. Overload test is to be carried out with 1.5 times of rated power for the period of 2 minutes for generators and at 1.6 times the rated torque for period of 15 seconds for motors.

3. On test items other than electrical equipment listed in a. through f. above, they are to be determined in a negotiation with the manufacturer.

5.3 Subsequent to the Approval

5.3.1 Stamping or marking

The electrical equipment which has passed the examination specified in 1.3.1 is to be identified as the equipment complying with the Rules by a label indicating the serial number, the examination date and BKI's identification number and stamp.

5.3.2 Operation test on individual equipment

Notwithstanding the requirements of 1.3.1, BKI's surveyor may attend an operation test on individual equipment with a capacity of 50 kW (or kVA) or more for motor and generator and 100 kVA or more for transformer and produced in a small lot.

6. Exhaust Gas Turbochargers

6.1 General

6.1.1 Scope

.1 The requirements in this 6, in general, apply to exhaust gas turbochargers (hereinafter referred to as the "turbochargers" in 6.) manufactured at the same manufacturing works.

.2 The requirements specifically prescribed in 6. supersede those specified in 1.

6.2 Initial Assessment

6.2.1 Approval tests

.1 The approval tests are to be carried out on the standard turbocharger randomly selected one for each type from the production line.

.2 The test items of the approval tests are, in general, to be as follows:

a. Hot running test for 1 hour under maximum permissible speed and maximum permissible temperature

b. Over-speed test

c. Performance test

d. Overhaul inspection (carrying out after the running test)

.3 For manufacturers who have facilities in their works for testing the turbochargers on an engine for which the turbocharger is intended, the hot running test prescribed in 6.2.1.2 a. may be replaced by a trial run on the engine for 1 hour at 110% of the maximum continuous output of the engine.

6.3 Subsequent to the Approval

6.3.1 Examination on individual turbochargers

.1 For cooling space of each gas inlet and outlet casings, a hydraulic test, at a pressure of 0.4 MPa or 1.5 times the maximum working pressure whichever is the greater, is to be carried out.

Note:

The hydraulic test is, in general, to be carried out as indicated in the above. Special consideration, however, will be given by BKI, where design or testing feature necessitates modification of the test requirement.

.2 For rotating parts such as rotor shafts, bladed wheels, etc. or their complete rotating assembly, a dynamic balancing test is to be carried out in accordance with the approved procedure for the quality control.

.3 For impellers and inducers, an over speed test for the duration of 3 minutes, at 120% of the maximum speed under a room temperature or at 110% of the maximum speed under the working temperature, is to be carried out.

.4 As for forged impellers and inducers which are subjected to the quality control through the approved non-destructive test method, the over speed test may be dispensed with.

.5 Trial run

– A mechanical running test for 20 minutes at the maximum speed is to be carried out. However, BKI may reduce the duration of the test taking the result of the developing tests into consideration.

– In case where the turbochargers are produced under an approved quality system and the type of the turbochargers has sufficient test records, the test in a may be carried out on a sample basis.

– For manufacturers who have facilities in their works for testing the turbochargers on an engine for which the turbocharger is intended, the trial run may be replaced by a trial run on the engine for 20 minutes at 110% of the maximum continuous output of the engine.

7. Air Compressors

7.1 General

7.1.1 Scope

.1 The requirements in this 7, in general, apply to air compressors manufactured at the same manufacturing works.

.2 The requirements specifically prescribed in this 7. supersede those specified in 1.

7.1.2 Definitions

.1 Air compressors to which 7. applies are those used for compressing air for starting diesel engines, controlling machinery and equipment, power sources and general service, and are of the piston type or vane type.

.2 The major components referred to in this 7. are as follows:

Cylinder head, cylinder, piston, piston pin, connecting rod, crankshaft, bearing (small end and big end bearing, main bearing), crankcase, suction valve, discharge valve, intercooler, after cooler, attached pump (lubricating oil and cooling water), outlet non-return valve, relief valve.

7.2 Initial Assessment

7.2.1 Approval tests

.1 The approval tests are to be carried out on the air compressor randomly selected one for each type from the production line.

.2 The items of the approved tests are, in general, to be as follows:

a. Examination of construction

b. Pressure test and air-tightness test

c. Operational test:

- Continuous running test (for 1 hour)
- Performance test
- Operational test of safety devices

d. Overhaul inspection

e. Other tests as deemed necessary by BKI

8. Water Pumps and Oil Pumps

8.1 General

8.1.1 Scope

.1 The requirements in this 8, in general, apply to water pumps and oil pumps manufactured at the same manufacturing works.

.2 The requirements specifically prescribed in this 8. supersede those specified in 1.

8.1.2 Definitions

.1 Water pumps to which this 8. applies are those used for transferring or supplying sea water, fresh water, feed water, bilge, etc., and oil pumps to which this 8. applies are those used for transferring and supplying fuel oil, lubricating oil, thermal oil, waste oil, etc.

.2 The major components referred to in this 8. are as follows:

a. Centrifugal type:
Casing, cover, impeller, shaft, bearing, sealing device

b. Rotating type:
Casing, cover, connecting rod, liner, vane, shaft, bearing, sealing device

c. Reciprocating type:
Casing, cover, piston, plunger, cylinder, crankshaft, bearing, control valve, sealing device

8.2 Initial Assessment

8.2.1 Approval tests

.1 The approval tests are to be carried out on the water pump or the oil pump randomly selected one for each type from the production line.

.2 The items of the approval tests are, in general, to be as follows:

a. Examination of construction

b. Pressure test

c. Operation test

d. Continuous running test

e. Overhaul inspection

f. Other tests as deemed necessary by BKI

9. Outboard Engines

The requirements for type approval test of outboard engine are in accordance with Guidance for Mass Produced Engines (Pt.1, Vol.K) Sect. 4.

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Section 3

Requirements for Approval of Service Suppliers

A. General

1. General

1.1 Application

1.1.1 This Section applies to service suppliers listed as follows:

.1 Statutory services:

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

b. Firms engaged in servicing and testing of radio communication equipment on ships

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

d. Firms engaged in performance tests of Voyage Data Recorders (VDRs)

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

f. 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

g. Firms engaged in the servicing and maintenance of lifeboats, launching appliances, on-load release gear and davit-launched liferaft automatic release hooks.

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

.2 Classification and/or Statutory services:

a. Firms engaged in thickness measurements on ships

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

c. Firms engaged in services of fire Fighting equipment and systems

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

e. Firms engaged in measurements of noise level on board ships

f. Firms engaged in examination of Ro-Ro ship's bow, stern, side and inner doors

g. 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.

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

.3 Where BKI accepts work of a third party (e.g., service supplier) approved by itself, BKI shall verify the performance of such services. For statutory service, the scope of verification may be increased if there are additional requirements stipulated by flag Administration. The process shall be defined within BKI's quality management system. For the purpose of accountability to the flag Administration, the work

performed by the third party (e.g., service supplier) constitutes the work of BKI and shall be subject to the requirements incumbent upon BKI under the RO Code IMO MSC.349(92) and MEPC.237(65).

1.1.2 Firms listed in 1.1.1.1 and 1.1.1.2 are to comply with the requirements in this Section as well as the requirements in Section 1.

1.1.3 Firms engaged in testing of coating systems are to comply with the requirements deemed appropriate by BKI as well as the requirements in Section 1.

1.1.4 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.

- Firms engaged in thickness measurements on ships
- Firms carrying out in-water survey of ships and mobile offshore units
- Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment

1.1.5 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.).

1.1.6 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

1.2 Equivalency

Even in case it is difficult to conform to the requirements in this Section, if BKI admits a matter as equivalent to the requirements in this Section, the matter may be regarded as conforming to this Section.

2. Quality System

2.1 General

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 2.2 through 2.7.

2.2 Training

2.2.1 The supplier's management is to provide the training of all personnel who are engaged in the activities which can affect quality of the relevant services.

2.2.2 The supplier's management is to establish and maintain a documented procedure for implementing the training specified in 2.2.1.

2.2.3 The supplier's management is to establish and maintain a list of operators and supervisors documenting name, qualifications, training and experience within the relevant service area.

2.3 Measuring and Testing Equipment

2.3.1 Measuring and testing equipment to maintain quality of the relevant services is to be provided at the supplier.

2.3.2 The supplier's management is to establish and maintain a documented procedure to control, calibrate and maintain the equipment specified in 2.3.1.

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.

2.4 Work Procedure

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

2.5 Subcontracting Control

2.5.1 In case where any parts of the services provided are sub-contracted, the supplier's management is to examine and evaluate the subcontractor's quality system and works to verify that the subcontractor has enough capability to provide subcontracted services with required quality.

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

2.5.3 The supplier's management is to establish and maintain a documented procedure for implementing the subcontracting control specified in 2.5.1 and the order specified in 2.5.2.

2.6 Verification Resources

2.6.1 The supplier's management is to verify quality of the services provided.

2.6.2 The supplier's management is to perform the internal quality audits periodically. As to the results of the audits, the following .1 thought .3 are to be ensured.

.1 The audit results are to be reported to the supplier's management and the sections audited.

.2 Based on the audit results, the supplier's management is to review the quality system when necessary.

.3 The audit results and the records of the management review are all to be maintained.

2.6.3 The supplier's management is to establish and maintain a documented procedure for implementing the verification specified in 2.6.1 and the internal quality audit specified in 2.6.2.

2.7 Reporting to the BKI

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

3. Control of data

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

Note:

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

B. Firms Engaged in Thickness Measurements on Ships

1. Quality System

1.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 1.1.1 through 1.1.5.

1.1.1 Inspection preparation

1.1.2 Selection and identification of test locations

1.1.3 Surface preparation and protective coating preservation

1.1.4 Calibration checks

1.1.5 Reporting the results of the measurements by documents and computerized data and the verification by BKI's surveyor

2. Operators and Supervisors

2.1 Training

Operators carrying out thickness measurements and supervisors are to have sufficient knowledge as to following 2.1.1 through 2.1.4. A documented training procedure required in A.2.2 is at least to contain information on them.

2.1.1 Outline of hull structures and structural members.

2.1.2 Mid-ship sections of typical ship type.

2.1.3 Typical damages and positions where corrosions are liable to occur, of typical ship types.

2.1.4 Outline of BKI's Guidance on thickness measurements.

2.2 Qualification

2.2.1 Operators carrying out thickness measurements are to qualified in accordance with a recognized industrial NDT standard.

2.2.2 In general, operators and supervisors listed in the following are to be attached to the supplier.

.1 One or more who have experiences on thickness measurements for 10 years or over.

.2 Three or more who have experiences on thickness measurements for 5 years or over.

.3 One or more who have enough knowledge of hull structures, i.e. naval architects, and can act as Instructors and supervisors.

3. Thickness Measuring Equipment

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

4. Demonstration

4.1 On board demonstration is to be carried out at the presence of BKI's surveyor to verify that the supplier provides thickness measurements specified in the documents submitted. The ship used for the demonstration is preferably to be a large sized tanker, a bulk carrier or an ore carrier.

4.2 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.

4.3 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.4 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

C. Firms Carrying Out In-Water Survey of Ships and Mobile Offshore Units

1. Quality System

1.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 1.1.1 through 1.1.5.

1.1.1 Inspection preparation.

1.1.2 Guidance to divers along the hull parts to be inspected.

1.1.3 Two-way communication between divers and BKI's surveyor.

1.1.4 Video recording and closed circuit television operation.

1.1.5 Reporting the results of the inspection and the verification by BKI's surveyor.

2. Divers and Supervisors

2.1 Training

Divers carrying out In-Water survey and supervisors are to have sufficient knowledge as to following 2.1.1 through 2.1.8. A documented training procedure required in A.2.2 is at least to contain information on them.

2.1.1 Ship's underwater structure and appendages (including propeller shaft, propeller, rudder and its bearings, etc.).

2.1.2 Ship's terminology in English.

2.1.3 Underwater thickness measurements and non-destructive testing.

2.1.4 Bearing clearance measurements on rudders and propeller shafts.

2.1.5 Underwater video operation as well as still picture work.

2.1.6 Operation of underwater communication system.

2.1.7 Other special equipment and tools used for In-Water Survey

2.1.8 Outline of BKI's Rules on In-Water Survey

2.2 Qualification

2.2.1 Divers carrying out inspection are to have had at least 1 years experience and 10 different assignments as an assistant diver.

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

3. Equipment Used for In-Water Survey

The supplier is to have equipment listed in the following 3.1 through 3.6.

3.1 Closed circuit colour television with sufficient illumination equipment

3.2 Still photography camera

3.3 Video recording device connected to the closed circuit television

3.4 Two-way communication between diver and surface staff

3.5 Equipment for carrying out thickness measurements, non-destructive testing and measurements, e.g. clearances, indents, etc.

3.6 Equipment for cleaning of the hull

4. Demonstration

4.1 Demonstration to the actual ship is to be carried out at the presence of BKI's surveyor to verify that the supplier provides In-Water survey specified in the documents submitted.

4.2 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.

4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

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

1. Quality System

1.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 1.1.1 through 1.1.3.

1.1.1 Preparation of radio inspections

1.1.2 Carrying out radio inspections

1.1.3 Reporting the results of the inspections and the verification by BKI's surveyor

2. Radio Inspectors and Supervisors

2.1 Training

2.1.1 Radio inspectors carrying out inspections of radio installations and supervisors are to have sufficient knowledge as to following .1 through .5.

.1 Radiotelephony.

.2 Global Maritime Distress and Safety System (GMDSS).

.3 Outline of the recognized Rules on radio installations issued by Administration.

.4 Latest SOLAS Convention (International Convention for the Safety of Life at Sea), Radio Regulations of the International Telecommunication Union (ITU) and IMO (International Maritime Organization) Assembly Resolution concerning performance standards.

.5 MSC.1/Circ.1252 – Guidelines on Annual Testing of the Automatic Identification System (AIS)

2.1.2 A documented training procedure required in A.2.2 is at least to contain information on items listed in 2.1.1. And the supplier is to provide latest reference documents.

2.1.3 In accordance with the procedure specified in 2.1.2, inspection instructions issued by BKI are to be furnished to radio inspectors without fail.

2.2 Qualification

2.2.1 Radio inspectors carrying out inspections of radio installations are to satisfy the requirements in the following .1 through .4, with regard to competence and experience.

.1 Either of the following a or b is fulfilled:

a. To have a certificate recognized by an organization approved by the Government of a state.

b. To have had minimum 1 year education from a technical school relevant to radio.

.2 To have had minimum 1 year experience as an assistant radio inspector

.3 To have passed the training of the supplier regarding SOLAS Convention, ITU Radio Regulations and IMO Assembly Resolution concerning performance standards, and to be familiar with these technical requirements; and

.4 To be able to understand English.

2.2.2 Supervisors for inspections of radio installations are to satisfy the requirements in the following .1 through .3.

.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 minimum 2 years experiences as a radio inspector.

2.2.3 Notwithstanding the requirements in 2.2.1 and 2.2.2, BKI may appoint a person, who is deemed to have competence and experience equivalent to those specified in 2.2.1 or 2.2.2, as a radio inspector of radio installations or a supervisor.

2.2.4 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

3. Equipment Used for Radio Inspections

The supplier is to have equipment listed in the following 3.1 through 3.5.

3.1 Equipment for measuring frequency, voltage, current and resistance

3.2 Equipment for measuring output, reflect effect and modulation on Very High Frequency (VHF) and Medium Frequency / High Frequency (MF/HF)

3.3 Synchroscope

3.4 Acid tester for checking specific gravity of lead batteries

3.5 Tester for checking of correct output from free-float satellite Emergency Position Indicator Radio Beacon (EPIRB)

4. Demonstration

4.1 On board demonstration is to be carried out at the presence of BKI's surveyor to verify that the supplier provides radio inspections specified in the documents submitted.

4.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

E. Firms Engaged in Performance Tests of Voyage Data Recorders (VDRs)

1. Quality System

1.1 Work Procedure

A documented work procedure specified in A.2.4 is at least to contain information on items listed in the following 1.1.1 through 1.1.4.

1.1.1 Preparation of performance tests of VDRs

1.1.2 Implementation of performance tests of VDRs

1.1.3 Reporting the results of performance tests of VDRs and verification by BKI's surveyor

1.1.4 Issue of service record certificates

2. Firms

2.1 Education and Training

2.1.1 Firms responsible for the carrying out of performance tests on VDRs are to maintain those up-to-date versions of the books and documents referred to in the following .1 through .3.

.1 The requirements of VDRs and the inspection instructions

.2 The latest Safety of Life at Sea (SOLAS), International Maritime Organization (IMO) Assembly Resolution concerning performance standards, and International Electrotechnical Commission (IEC) standards

.3 The following reference documents concerning VDRs in question:

- Installation manual.
- Operation and maintenance manual.
- Information for use by an investigation authority.

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

.1 Procedures to learn the knowledge specified in 2.1.1 above.

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

2.2 Qualifications, etc.

2.2.1 Firm responsible for the carrying out performance tests on VDRs are to comply with the requirements specified in the following:

.1 Firm are to provided evidence that they have been authorized or licensed by the relevant manufacturer to carry out performance tests on VDRs.

.2 In general, one or more operators and supervisors (are specified below) are to be assigned to suppliers respectively.

i) **Operators** : Those persons who have qualifications approved by the relevant manufacturer for the carrying out of performance tests on VDRs and have one year or more prior experience as a sub-operator of VDRs as well as have conducted such performance tests at least once before.

ii) **Supervisors** : Those persons who have 2 or more years experience as an operator of VDRs

2.2.2 Notwithstanding **2.2.1** above, BKI may appoint a firm as the firm responsible for carrying out the performance tests of VDRs that is deemed to have qualifications equivalent to those specified **2.2.1**

3. Equipment for the Performance Tests of VDRs

Firm are to have the equipment specified in the following available for carrying out of performances test on VDRs.

3.1 Instruments for measuring frequency, voltage, current and resistance

3.2 Playback hardware of recorded data, speakers, printers and memories

3.3 Playback software of recorded data

3.4 Equipment for testing underwater acoustic beacon

4. Demonstration

4.1 On board demonstration is to 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.

4.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

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

1. General

The requirements in D of this Section also applied 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. Equipment Used for AIS Inspections

The supplier is to have equipment listed in the following 2.1 through 2.2.

2.1 Equipment for measuring frequency, voltage, current and resistance

2.2 Equipment for testing the performance of Automatic Identification Systems (AIS)

G. Firms Engaged in Services of Fire Fighting Equipment and Systems

1. General

1.1 Application

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

1.1.1 Fixed fire-extinguishing systems.

1.1.2 Portable fire extinguishers.

1.1.3 Fire detection and alarm systems.

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 2.1.1 through 2.1.4.

2.1.1 Preparation and implementation of the services of firefighting equipment and systems

2.1.2 Records of conditions of defects found during the services

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

2.1.4 Issue of service record certificates

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 .5.

.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.

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, etc.

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 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 1year experience of on-the-job training for the services of firefighting equipment and systems.

3.2.3 Supervisors carrying out the services of firefighting equipment and systems are to have at least 2 years' experience as an operator.

4. Equipment for Services of Fire Fighting Equipment and Systems

The suppliers are to have the equipment for services of firefighting equipment and systems specified in the following 4.1 through 4.5.

4.1 General

- Reflecting mirrors and lighting to inspect inside of the fire extinguishers.
- Pressure gauges.
- Cylinder dryers.
- Gases (carbon dioxide, halon and nitrogen) filling equipment.
- Contents of filling.
- Spare parts.

4.2 Fixed fire-extinguishing systems

- Gas level meters or measuring scales.
- Tools for ventilation test.

4.3 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.

4.4 Fire detection and alarm systems

- Equipment for the operation test.
- Tools for inspections of electrical equipment, such as a tester.

5. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

H. Firms Engaged in Services of Life-Saving Appliances

1. General

1.1 Application

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

1.1.1 Inflatable life rafts.

1.1.2 Inflatable lifejackets.

1.1.3 Hydrostatic release units.

1.1.4 Inflated rescue boats.

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 2.1.1 through 2.1.4.

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

2.1.2 Records of conditions of defects found during services.

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

2.1.4 Issue of service record certificates.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out services of life-saving appliances are to have sufficient knowledge as to the following .1 through .5.

.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.

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, etc.

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 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 life-saving appliances.

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

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

4. Equipment for Services of Life-Saving Appliances

The suppliers are to have the equipment for services of life-saving appliances specified in the following 4.1 through 4.6.

4.1 Pressure gauges.

4.2 Thermometers.

4.3 Barometers.

4.4 Air pumps with functions of air cleaning and drying (including the necessary high-pressure hoses and adapters).

4.5 A weight scale for inflation gas cylinders.

4.6 Inflation gases.

5. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

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

1. Quality System

1.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 1.1.1 through 1.1.6.

1.1.1 Preparation of tightness testing of hatches with ultrasonic equipment.

1.1.2 Manuals for the construction of hatches.

1.1.3 Adjustment and operations of the ultrasonic equipment.

1.1.4 Maintenance of the ultrasonic equipment.

1.1.5 Criteria for the test results.

1.1.6 Reporting the test results and the verification by BKI's surveyor.

2. Operators and Supervisors

2.1 Training

2.1.1 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.

2.1.2 A documented training procedures required in A.2.2 are to contain the procedures to learn the knowledge specified in 2.1.1.

2.2 Qualification, etc.

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

2.2.2 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.

2.2.3 Supervisors carrying out the tightness testing of hatches with ultrasonic equipment are to have at least 2 years' experience as an operator.

3. Equipment used for tightness testing of hatches with ultrasonic equipment

3.1 The suppliers are to have the ultrasonic equipment in compliance with the requirements specified in the following 3.1.1 through 3.1.3.

3.1.1 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.

3.1.2 The measurement sensitivity of the receiver is to be adjustable.

3.1.3 The receiver is to be provided with an audible signal and a visual readout in decibel.

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

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

4. Demonstration

4.1 On board demonstration is to 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.

4.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

J. Firms Engaged in Testing of Coating Systems

1 Quality System

1.1 Work procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following:

- preparation of the testing of coating systems
- implementation of the testing of coating systems
- criteria for the test results of coating systems
- issue of statement of compliance

2. Initial Assessment

Firms engaged in testing of coating systems is to submit 3 copies each of the following documents in addition to the documents specified in Section 1, B.3.1.:

a. Detailed list of the Laboratory test equipment for the IMO Resolution MSC.215(82) or MSC.288(87) as may be amended coating approval.

b. Detailed list of reference documents comprising a minimum those referred to in MSC.215(82) or MSC.288(87) as may be amended that are available in the laboratory.

c. Details of testing panel preparation, procedure of test panel identification, coating application, test procedures and a sample test report.

d. Details of exposure method and site for weathering primed test panels.

e. Sample daily or weekly log/form for recording test condition and observations including unforeseen interruption of the exposure cycle with corrective actions.

f. Details of any sub-contracting agreements.

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

3. Operators and Supervisors

3.1 Training

3.1.1 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.

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 the supplier is to provide latest reference documents.

4. Equipment for Testing of Coating Systems

4.1 The suppliers are to have the equipment for testing of coating systems for seawater ballast tank, etc. 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

4.2 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

5. Demonstration

5.1 Demonstration is to 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.g.** and deemed appropriate by BKI may be accepted as substitution.

5.2 In case where the supplier has been approved by administration and other Classification Societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

K. Firms Engaged in Services of Lifeboats, Launching Appliances and On-load Release Gear

1. General

1.1 Application

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

1.1.1 Lifeboats.

1.1.2 Launching appliances.

1.1.3 On-load release gear.

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 2.1.1 through 2.1.4.

2.1.1 Preparation and implementation of the service lifeboats, launching appliances and on-load release gear.

2.1.2 Records of condition of defects found during services.

2.1.3 Reporting the results of the services and the verification by BKI Surveyor.

2.1.4 Issue of service record certificates.

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisor carrying out services of lifeboats, launching appliances, and on-load release gear are to have sufficient knowledge as to the following .1 through .6.

.1 Construction and services of lifeboats, launching appliances, and on-load release gear.

.2 Operational methods of the equipment used for services of lifeboats, launching appliances and on-load release gear.

.3 The latest version of the *SOLAS (International Convention for the Safety of Life at Sea)*, as amended, *LSA Code (Life-Saving Appliances Code)*, *IMO (International Maritime Organization)* MSC.1/Circ.1206/Rev.1 and MSC.1/Circ.1277.

.4 Flag Administration requirements (where required).

.5 The requirements and inspection instruction for services of lifeboats, launching appliances and on-load release gear issued by BKI.

.6 Issuance procedure of a statement required under IMO (International Maritime Organization) MSC.1/Circ.1206/Rev.1.

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, etc.

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

3.2.2 As for the competence and experience, operators carrying out the services of lifeboats, launching appliances, and on-load release gear are to comply with the requirement specified in the following .1 to .2

.1 Operators are to have at least 1 year experience of on-the-job training for the services of lifeboats, launching appliances and on-load release gear.

.2 Operators are to have qualifications for the services of lifeboats, launching appliances and non-release gear approved by the manufacturer, where the services are provided.

3.2.3 Supervisors carrying out the services of lifeboats, launching appliances and on-load release gear are to have at least 2 years' experience as an operator.

4. Demonstration

4.1 On board demonstration is to 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.

4.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

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

1. General

1.1 Application

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

2. Quality System

2.1 Work Procedure

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

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

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

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out services of self-contained breathing apparatus are to have sufficient knowledge as to the following .1 through .4.

.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 MSC/Circ.1081 as may be amended.

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

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.

4. Equipment and Facilities

4.1 The suppliers are to have the equipment for inspection of self-contained breathing apparatus and systems specified in the following 4.1.1 through 4.1.7.

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

4.1.2 Various scales to weigh items

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

4.1.4 Flow meters

4.1.5 Pressure gauges or manometers

4.1.6 Equipment for checking air quality

4.1.7 Recharging facilities for breathing apparatus

4.2 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.

5. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the inspection reports carried out in the last six (6) months before expired date of the certificate.

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

1. General

1.1 Application

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.

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following 2.1.1 through 2.1.3.

2.1.1 Preparation and implementation of the examination of Ro-Ro ships bow, stern, side and inner doors

2.1.2 Records of condition of defects found during examination.

2.1.3 Reporting the results of the examination to Surveyor

3. Operators and Supervisors

3.1 Training

3.1.1 Operators and supervisors carrying out the services of firefighting equipment and systems 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 UR Z24 - Survey Requirements for Shell and Inner Doors of Ro-Ro ships, or its equivalent, by the relevant class society

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, etc.

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 .1 and .2.

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

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

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

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 examination (i.e. dye penetrant, magnetic particle inspection)

4.2 For tightness testing:

− Ultrasonic leak detector or equivalent

4.3 For inspection of hydraulic operating system:

− Pressure gauges

− Particle counter for analysing the quality of hydraulic fluid

4.4 For inspection of electric control system and indication system:

− Digital multi-meter

− Earth fault detector

5. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the examination reports carried out in the last six (6) months before expired date of the certificate.

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. General

1.1 Application

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

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 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, etc.

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.

3.2.3 Supervisor is to have had a minimum of two years experience as operator/technician/inspector within the activity.

4. Equipment

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. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.

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

1. General

1.1 Application

This subsection applies to firm engaged in inspection of extent of engagement – Sound pressure level measurements of public address and general alarm systems on board ships.

2. Quality System

2.1 Work Procedure

A documented work procedure required in A.2.4 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, etc.

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.

3.2.3 Supervisors carrying out the services of firefighting equipment and systems are to have at least 2 years experience as an operator.

4. Equipment

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. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.

P. Firms Engaged in Measurements of Noise Level Onboard Ships

1. General

1.1 Application

This subsection applies to firm engaged in Sound pressure level measurements onboard Ship.

2. Quality System

2.1 Work Procedure

Documented work procedures required in A.2.4 are at least to contain information on inspection preparation, selection and identification of sound level measurement locations, calibration checks and 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 .5.

.1 Procedures specified in IMO Code on Noise Levels onboard Ships

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

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

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

.5 BKI Guidelines for Crew Habitability on Ships (Pt. 7, Vol. B)

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, etc.

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 .4.

.1 Operators are to be able to document theoretical and practical training onboard in using a sound level meter

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

.3 Operators are to have knowledge in the field of noise, sound measurements and handling of measurement equipment

.4 Operators are to have 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,)

3.2.3 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)1, as amended, type/class [1] standard as applicable, or to an equivalent standard acceptable to the Administration [2].

4.2 Octave filter set

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

[1] Recommendation for sound level meters.
[2] Sound level meters class/type 1 manufactured according to IEC 651/IEC 804 may be used until 1 July 2016.
[3] Octave-band and fractional-octave-band filters

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.

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

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. Demonstration

5.1 On board demonstration is to 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.

5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.

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

1. General

1.1 Application

This subsection applies to firm engaged in 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 Quality System

2.2.1 Work Procedure

A documented work procedure required in A.2.4 is at least to contain information on items listed in the following .1 through .3.

.1 Preparation of the testing of primary and secondary barriers

.2 Implementation of the testing of primary and secondary barriers

.3 Reporting the results of the testing to Surveyor. The report is to contain the following:

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

2.3 Equipment

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

2.4. Demonstration

2.4.1 On board demonstration is to 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.

2.4.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

2.4.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.

3. Firms Engaged in Acoustic Emission (AE) Testing

3.1 Quality System

3.1.1 Work Procedure

The supplier is to have documented procedures based upon recognized national or international industrial standards to perform ultrasonic leak test using AE sensors for the secondary barrier of membrane cargo containment systems.

The procedures are to include details of personnel responsibilities and qualification, instrumentation, test preparation, test method, signal processing, evaluation and reporting. 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

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 Demonstration

3.5.1 On board demonstration is to 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.

3.5.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

3.5.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.

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 Quality System

4.2.1 Work Procedure

A documented work procedure required in A.2.4 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 to Surveyor. 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

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. Certification by the supplier is not allowed and must be obtained through an independent certification body.

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. Certification by the supplier is not allowed and must be obtained through an independent certification body.

4.4 Equipment

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

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

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. Certification by the supplier is not allowed and must be obtained through an independent certification body.

4.6 Demonstration

4.6.1 On board demonstration is to 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.

4.6.2 In case where the supplier has been approved by other classification societies, a part of or the whole of the demonstration may be dispensed with.

4.6.3 For renewal assessment, demonstration may be dispensed with if the service supplier can provide the service reports carried out in the last six (6) months before expired date of the certificate.