

# GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

**Guidance for the Approval and Type Approval of Materials and Equipment for  
Marine Use** **2015 AMENDMENT NO.2**

Notice No.89      25th December 2015

Resolved by Technical Committee on 2nd February 2015 / 28th July 2015

**ClassNK**  
NIPPON KAIJI KYOKAI

Notice No.89 25th December 2015

## AMENDMENT TO THE GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

“Guidance for the approval and type approval of materials and equipment for marine use” has been partly amended as follows:

### Amendment 2-1

## Part 1 METALLIC MATERIALS

### Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ROLLED STEELS

#### 1.4 Approval Test

##### 1.4.1 Extent of the Approval Tests

Sub-paragraph -1(1) has been amended as follows.

**1** Approval for the manufacturing process of rolled steels is to be the following **(1)** and **(2)** if deemed appropriate by the Society.

**(1)** Rolled steels for hull, rolled steels for low temperature service and high strength quenched and tempered rolled steels for structure

Approval for any grade of steels may also covers approval for any lower grade of steels (of which specific temperature of impact test is higher than that of test sample) in the same strength level provided that kind, deoxidation practice, grain refining ~~elements~~ elements and micro-alloying elements, heat treatment, steel making process, steel casting process and maximum manufacturing thickness or dimensions are same. For higher tensile steels for hull, in addition to above, approval of one strength level may also covers the approval of the same grade and below in the strength level immediately below.

##### 1.4.2 Selection of Test Samples

Sub-paragraph -1(1) has been amended as follows.

**1** Test samples used for approval test of rolled steels are to be selected according to the following **(1)** and **(2)**:

**(1)** Test samples are generally to be selected for each grade and kind by each charge of rolled steels of which deoxidation practice, grain refining ~~elements~~ elements and micro-alloying elements, heat treatment, steel making process and steel casting process are same.

Sub-paragraph -3 has been amended as follows.

**3** Where the maximum manufacturing thickness of rolled steels for hull, rolled steels for low temperature service and quenched and tempered high tensile rolled steels, is *50mm*, *40mm* and

70mm, and over respectively, and in case of first approval of at least one item of deoxidation practice, grain refining ~~elements~~ and micro-alloying elements, heat treatment, steel making process and steel casting process, Society may request an additional test samples of which thickness is indicated with a ● mark in **Table 1.1-1** or other proper thickness, in addition to the test samples in accordance with -2.

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 25 December 2015.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to rolled steels other than those for which the application for approval is submitted to the Society on or after the effective date.

## Part 1 METALLIC MATERIALS

### Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ROLLED STEELS

#### 1.5 Approval

##### 1.5.3 Renewal of Approval

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit a “Certificate of Approval” (~~original copy~~) (in the case of the corrosion resistant steel for cargo oil tanks specified in **3.13, Part K of the Rules for the Survey and Construction of Steel Ships**, the “Type Approval Certificate” (~~original copy~~) and three copies of the data showing actual manufacturing records (for example, chemical composition, mechanical properties and thickness or dimension expressed in the form of histogram or statistics for each heat treatment) of the rolled steels or semi-finished products within the specific period together with application form (**Form 1-2**) (in the case of corrosion resistant steel for cargo oil tanks, **Form 1-2B**).

Sub-paragraph -6 has been added as follows.

**6** Manufacturers whose approval is renewed are to return the old “Certificate of Approval” or the “Type Approval Certificate” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

##### 1.5.4 Changes in the Approved Content

Sub-paragraphs -1 and -2 have been amended as follows.

**1** In case of changes in the approved content such as those given in the following **(1)** through **(9)** are occurred, in response to the content of changes, three copies of documents corresponding to the requirements in **1.2.2** are to be submitted to the Society, in addition to a copy of “Application for Changes in the Approved Content of Manufacturing Process of Rolled Steels” and a “Certificate of Approval” (~~original copy~~).

- (1) Addition to material grades
- (2) Changes in the steel making process
- (3) Changes in the casting making process
- (4) Changes in the rolling process
- (5) Changes in the limits of thickness
- (6) Changes in the heat treatment process
- (7) Changes in the chemical composition, added element etc.
- (8) In case of a part of manufacturing process (rolling, heat treatment etc.) is assigned to other works
- (9)

(9) Changes in the kind of semi-finished product being used

**2** For the corrosion resistant steel for cargo oil tanks specified in **3.13, Part K of the Rules for the Survey and Construction of Steel Ships**, in case of changes in the approved content such as those given in the above -**1(1)** through **(9)** and following **(1)** and **(2)** are occurred, in response to the content of changes, three copies each of documents corresponding to the requirements in **1.2.2** are to be submitted to the Society, in addition to a copy of “Application for Changes in the Approved Content of Manufacturing Process of Corrosion Resistant Steel for Cargo Oil Tanks” and the “Type Approval Certificate” (~~original~~ copy).

- (1) Changes in the chemical composition range of elements to be added for improving the corrosion resistance
- (2) Changes in the applicable welding consumables

Sub-paragraph -5 has been added as follows.

**5** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” or old “Type Approval Certificate” and the relevant “Particulars of Approval Conditions” to the Society as soon as possible after receiving the new certificate.





## **Chapter 1B    APPROVAL OF MANUFACTURING PROCESS OF SEMI-FINISHED PRODUCTS**

### **1B.5    Approval**

#### **1B.5.3    Renewal of Approval**

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit a “Certificate of Approval” (~~original copy~~) and three copies of the data showing actual manufacturing records (for example, chemical composition, mechanical properties and thickness or dimension expressed in the form of histogram or statistics) of the semi-finished products within the specific period together with application form (**Form 1B-2**).

Sub-paragraph -6 has been added as follows.

**6** Manufacturers whose approval is renewed are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

#### **1B.5.4    Changes in the Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In case of changes in the approved content such as those given in the following **(1)** through **(5)** are occurred, in response to the content of changes, three copies of documents corresponding to the requirements in **1B.2.2** are to be submitted to the Society, in addition to a copy of “Application for Changes in the Approved Content of Manufacturing Process of Semi-Finished Products” and a “Certificate of Approval” (~~original copy~~).

- (1) Changes in the steel making process
- (2) Changes in the casting making process
- (3) Changes in the steel making plants
- (4) Changes in the limits of dimension
- (5) Changes in the chemical composition, added element etc.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” and the relevant “Particulars of Approval Conditions” to the Society as soon as possible after receiving the new certificate.



## Chapter 2 APPROVAL OF MANUFACTURING PROCESS OF STEEL PIPES

### 2.5 Approval

#### 2.5.3 Renewal of Approval

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit a “Certificate of Approval” (~~original copy~~) and three copies of the data showing actual manufacturing records (for example, chemical composition, mechanical properties, outer diameter and thickness expressed in the form of histogram or statistics) of the steel pipes within the specific period together with an application from (**Form 1-5**).

Sub-paragraph -6 has been added as follows.

**6** Manufacturers whose approval is renewed are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

#### 2.5.4 Changes in the Approved Content

Sub-paragraph -1 has been amended as follows.

**1** In case of changes in the approved content such as those given in the following **(1)** through **(9)** are occurred, in response to the content of changes, three copies of documents corresponding to the requirements in **2.2.2** are to be submitted to the Society, in addition to one copy of “Application for Changes in the Approved Content of Manufacturing Process of Steel Pipes” and a “Certificate of Approval” (~~original copy~~).

- (1) Addition to material grades
- (2) Changes in the steel making process
- (3) Changes in the casting making process
- (4) Changes in the rolling process
- (5) Changes in the limits of outer diameter and thickness
- (6) Changes in the heat treatment process
- (7) Changes in the chemical composition, added element etc.
- (8) In case of a part of manufacturing process (rolling, heat treatment etc.) is assigned to other works
- (9) Use of semi-finished products manufactured by other works

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” and the relevant “Particulars of Approval Conditions” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

Form 1-5 has been amended as follows.

Form 1-5

To: NIPPON KAIJI KYOKAI _____ branch (Name of branch office)	Ref. No. _____ Date: _____
<b>APPLICATION FOR RENEWAL APPROVAL OF MANUFACTURING PROCESS OF STEEL PIPES</b>	
We hereby request renewal approval of the manufacturing process of the steel pipe described in Certificate of Approval hereunder in accordance with the requirements in <b>1.2, Part K of the Rules for the Survey and Construction of Steel Ships.</b>	
1. Approval number	:
2. Validity of approval	:
3. Date showing actual manufacturing records	:
(a) Yes	
(b) No	
4. Date for factory inspection	:
5. Attached documents (check if appropriate)	:
(a) Certificate of Approval ( <del>original</del> copy)	
(b) Data showing actual manufacturing records	(3 copies)
(c) Others ( )	(3 copies)
Name of works _____	
Address of works _____	
Personnel in charge _____	
Phone No. and Fax. No. _____	
(Signature )	

## Chapter 3      **APPROVAL OF MANUFACTURING PROCESS OF STEEL CASTINGS AND STEEL FORGINGS**

### **3.5      Approval**

#### **3.5.3      Renewal of Approval and Changes in the Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval or for changes in the approved content of “Certificate of Approval” specified in **3.5.1-1** is occurred, the applicant is to apply in accordance with the requirements of **3.2**. In this case, “Certificate of Approval” (~~original~~ copy) and the documents specified in **3.2.2** are to submit together with the application form (**Form 1-7**). However, the data to be submitted may be limited for reference data on the changes.

Sub-paragraphs -7 and -8 have been added as follows.

**7** Manufacturers whose approval is renewed are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

**8** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” and the relevant “Particulars of Approval Conditions” to the Society as soon as possible after receiving the new certificate.

Form 1-7 has been amended as follows.

Form 1-7

To: NIPPON KAIJI KYOKAI  
\_\_\_\_\_ branch  
(Name of branch office)

Ref. No. \_\_\_\_\_  
Date: \_\_\_\_\_

APPLICATION FOR RENEWAL APPROVAL OF MANUFACTURING PROCESS OF  
CASTINGS/FORGINGS

We hereby request renewal approval of the manufacturing process of castings / forgings described in Certificate of Approval hereunder in accordance with the requirements in **1.2, Part K of the Rules for the Survey and Construction of Steel Ships.**

1. Approval number :
  2. Validity of approval :
  3. Date showing actual manufacturing records :  
(a) No  
(b) Yes (item )
  4. Date for factory inspection :
  5. Attached documents (check if appropriate) :
    - (a) Certificate of Approval (~~original~~ copy)
    - (b) Data showing actual manufacturing records 3 copies
    - (c) Reference date 3 copies (In case of in preceding 3(b) or major changes is existed from previous submitted documents.)
- |                                |                              |
|--------------------------------|------------------------------|
| (1) Factory layout drawings    | (2) Manufacturing facilities |
| (3) Manufacturing process flow | (4) Quality control system   |
| (5) Quality standards          | (6) Others                   |

Name of works  
\_\_\_\_\_

Address of works  
\_\_\_\_\_

Personnel in charge  
\_\_\_\_\_

Phone No. and Fax. No.  
\_\_\_\_\_

(Signature: \_\_\_\_\_ )

## Chapter 5 APPROVAL OF MANUFACTURING PROCESS OF ALUMINIUM ALLOYS

### 5.5 Approval

#### 5.5.3 Renewal of Approval

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit a “Certificate of Approval” (~~original copy~~) and three copies of the data showing actual manufacturing records (for example, chemical composition, mechanical properties for each grade and thickness expressed in the form of histogram or statistics) of the aluminium alloys within the specific period together with a application form (**Form 1-2**).

Sub-paragraph -6 has been added as follows.

**6** Manufacturers whose approval is renewed are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

#### 5.5.4 Changes in the Approved Content

Sub-paragraph -1 has been amended as follows.

**1** In case of changes in the approved content such as those given in the following **(1)** through **(9)** is occurred, in response to the content of changes, three copies of documents corresponding to the requirements in **5.2.2** are to be submitted to the Society, in addition to one copy of “Application for Changes in the Approved Content of Manufacturing Process of Aluminium Alloys” and a “Certificate of Approval” (~~original copy~~).

- (1) Addition to material grades
- (2) Changes in the steel making process
- (3) Changes in the casting making process
- (4) Changes in the rolling process or extrusion process
- (5) Changes in the limits of thickness or dimension
- (6) Changes in the heat treatment process
- (7) Changes in the chemical composition, added element etc.
- (8) In case of a part of manufacturing process (rolling, extrusion, heat treatment etc.) is assigned to other works
- (9) Use of semi-finished products (slabs, blooms and billets etc.) manufactured by other works

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” and the relevant “Particulars of Approval Conditions” to the Society as soon as possible after receiving the new certificate.

## Part 2 EQUIPMENT

### Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ANCHORS

#### 1.5 Approval

##### 1.5.3 Renewal of Approval and Changes in the Approved Content

Sub-paragraph -1 has been amended as follows.

**1** In cases where changes have been made to the approved content of the “Certificate of Approval” specified in **1.5.1**, the applicant is to apply for renewal of approval in accordance with the requirements in **1.2**. In such cases, ~~the original~~ a copy of the “Certificate of Approval” and the documents specified in **1.2.2** are to be submitted together with the application form (**Form 2-1**). However, the data to be submitted may be limited to reference data on the changes.

Sub-paragraphs -6 and -7 have been added as follows.

**6** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

**7** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

### Chapter 2 APPROVAL OF MANUFACTURING PROCESS OF CHAINS

#### 2.6 Approval

##### 2.6.3 Renewal of Approval and Changes in the Approved Content

Sub-paragraph -1 has been amended as follows.

**1** In cases where changes have been made to the approved content of the “Certificate of Approval” specified in **2.6.1**, the applicant is to apply for renewal of approval in accordance with the requirements of **2.2**. In such cases, ~~the original~~ a copy of the “Certificate of Approval” and the documents specified in **2.2.2** are to be submitted together with the application form (**Form 2-2**). However, the data to be submitted may be limited to reference data on the changes.

Sub-paragraphs -6 and -7 have been added as follows.

**6** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

7 Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

### **Chapter 3 APPROVAL OF MANUFACTURING PROCESS OF CHAIN ACCESSORIES**

#### **3.6 Approval**

##### **3.6.3 Renewal of Approval and Changes in the Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In cases where changes have been made to the approved content of the “Certificate of Approval” specified in **3.6.1**, the applicant is to apply for renewal of approval in accordance with the requirements of **3.2**. In such cases, ~~the original~~ a copy of the “Certificate of Approval” and the documents specified in **3.2.2** are to be submitted together with the application form (**Form 2-2**). However, the data to be submitted may be limited to reference data on the changes.

Sub-paragraphs -6 and -7 have been added as follows.

**6** Manufacturers whose renewal is approved are to return old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

**7** Manufacturers whose request for changes in approved content is accepted are to return old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

### **Chapter 4 APPROVAL OF RAW TEXTILES FOR SYNTHETIC FIBRE ROPES**

#### **4.5 Approval**

##### **4.5.3 Renewal of Approval and Changes in the Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In cases where changes have been made to the approved content of the “Certificate of Approval” specified in **4.5.1**, the applicant is to apply for renewal of approval in accordance with the requirements of **4.2**. In such cases, ~~the original~~ a copy of “Certificate of Approval” and the documents specified in **4.2.1** are to be submitted together with the application form (**Form 2-3**). However, the data to be submitted may be limited to reference data on the changes.

Sub-paragraphs -6 and -7 have been added as follows.

6 Manufacturers whose renewal is approved are to return the old “Type Approval Certificate” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

7 Manufacturers whose request for changes in approved content is accepted are to return the old “Type Approval Certificate” to the Society as soon as possible after receiving the new certificate.

## **Chapter 6      EMERGENCY TOWING ARRANGEMENTS**

### **6.6      Approval**

#### **6.6.3      Renewal of Approval and Changes in the Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In cases where changes have been made to the approved content of the “Certificate of Approval” specified in **6.6.1**, the applicant is to apply for renewal of approval in accordance with the requirements of **6.2**. In such cases, ~~the original~~ a copy of the “Certificate of Approval” and the documents specified in **6.2.1** are to be submitted together with the application form (**Form 2-5**). However, the data to be submitted may be limited to reference data on the changes.

Sub-paragraphs -6 and -7 have been added as follows.

6 Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

7 Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

## **Chapter 8      SEWAGE TREATMENT PLANT AND SEWAGE COMMUNITING AND DISINFECTING SYSTEM**

### **8.6      Approval**

#### **8.6.3      Renewal of Approval**

Sub-paragraph -2 has been amended as follows.

**2** In case where renewal of the validity is intended, the manufacturer is to submit the necessary documents together with a copy of the existing certificate in accordance with the requirements of

**8.2** newly. In this case, the documents specified in **8.2** may be limited to the portion subjected to modification only.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## **Chapter 9 APPROVAL OF USE OF FIBER REINFORCED PLASTIC (FRP)**

### **9.5 Notice of Approval**

#### **9.5.3 Renewal of Approval**

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit ~~the original~~ a copy of “Certificate of Approval” and three copies of data showing actual manufacturing records of the FRP within the specific period of time together with an application form.

Sub-paragraph -5 has been added as follows.

**5** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

#### **9.5.4 Changes in Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In case of changes to an approved FRP, the applicant is to submit ~~the original~~ a copy of the “Certificate of Approval” and three copies of the documents specified in **9.2.3** together with an application form.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

## Chapter 10 SHIPBOARD INCINERATOR

### 10.5 Approval

#### 10.5.3 Renewal of Approval

Sub-paragraph -2 has been amended as follows.

**2** In case where renewal of validity is intended, a copy of the existing certificate is to be submitted in accordance with the requirements of **10.2** newly. In this case, the data required per **10.2.3** may be limited to the portion subjected to modification only.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## **Part 4 NON-METALLIC MATERIALS AND COATING MATERIALS FOR HULL**

### **Chapter 4 APPROVAL OF COATING SYSTEM**

#### **4.5 Notice of Approval**

##### **4.5.3 Renewal of Approval**

Sub-paragraph -1 has been amended as follows.

**1** In case of application for renewal of approval, the applicant is to submit a “Certificate of Approval” (~~original copy~~) and three copies of the data showing actual manufacturing records of the coating constituted coating system within the specific period together with an application form.

Sub-paragraph -5 has been added as follows.

**5** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

##### **4.5.4 Changes in Approved Content**

Sub-paragraph -1 has been amended as follows.

**1** In case of changes to an approved system, the applicant is to submit the “Certificate of Approval” (~~original copy~~) and three copies of the documents specified in **4.2.2** together with the application form.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose request for changes in approved content is accepted are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate.

## **Part 6 MACHINERY**

### **Chapter 5 APPROVAL OF MANUFACTURING BOILERS AND GROUP 1 PRESSURE VESSELS**

#### **5.4 Validity of Approval**

##### **5.4.1 Validity of Approval**

Sub-paragraph -2 has been amended as follows.

**2** In case where renewal of validity is intended, an application stating changes in the manufacturing procedure, etc., if any, is to be submitted to the Society (Survey Office) together with a copy of the existing certificate.

Sub-paragraph -3 has been added as follows.

**3** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

### **Chapter 9 APPROVAL OF USE OF MECHANICAL JOINTS**

#### **9.4 Approval**

##### **9.4.3 Renewal of Approval**

Sub-paragraph -2 has been amended as follows.

**2** In case where renewal of validity is intended, the manufacturer is to submit a copy of the existing certificate in accordance with the requirements of **9.2** newly. In this case, the data required per **9.2** may be limited to the portion subjected to modification only.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## Chapter 10 APPROVAL OF USE OF CRANKCASE EXPLOSION RELIEF VALVES

### 10.4 Approval

#### 10.4.2 Renewal of Approval

Sub-paragraph -2 has been amended as follows.

**2** In case where renewal of validity is intended, the manufacturer is to submit a copy of the existing certificate in accordance with the requirements of **10.2** newly. In this case, the data required per **10.2** may be limited to the portion subjected to modification only.

Sub-paragraph -4 has been added as follows.

**4** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## **Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS**

### **Chapter 1 APPROVAL OF USE OF AUTOMATIC DEVICES AND EQUIPMENT**

#### **1.4 Approval Procedures**

Paragraph 1.4.4 has been amended as follows.

##### **1.4.4 Renewal of Validity**

For renewal the validity, manufacturer is to submit to the Society an application (**Form 7-1**, attached) accompanied with a copy of the certificate previously issued. The change of the specification, if any, is to be described in the application. When the specifications of the approved equipment remain unchanged, the certificate will be issued with another 5 *years* valid term by the Society. In this case, the existing certificate is to be returned to the Society as soon as possible after receiving the new certificate.

#### **1.5 Changes in Particulars, Material, Construction, etc. of Approved Equipment**

Paragraph 1.5.1 has been amended as follows.

##### **1.5.1 Changes in Particulars, Material, Construction, etc. of Approved Equipment**

**1** In case where the particulars, materials, construction, dimensions, etc. of major components of the approved equipment are intended to be changed, the manufacturer is to submit to the Society each three copies of application for changes (**Form 7-1**, attached), explanatory notes for changes and necessary drawings, accompanied with a copy of the certificate previously issued.

**2** Upon examination of the drawings and documents, etc. according to **1.5.1** above, a confirmation test for changes are to be carried out when considered necessary.

The test items of confirmation tests are to be determined in each case according to the substance of changes.

**3** When confirmation tests are carried out, the manufacturer is to submit to the Society three copies of the test records.

**4** As a result of the examination of the application and confirmation test records, the Society, when deemed them appropriate, reissues the certificate with contents duly revised. In this case, the existing certificate is to be returned to the Society as soon as possible after receiving the new certificate.

## Chapter 2 APPROVAL OF USE OF LOADING COMPUTER

### 2.4 Tests and Inspection

Paragraph 2.4.4 has been amended as follows.

#### 2.4.4 Renewal of Validity

For renewal of validity, the manufacturer is to submit to the Society an application (Specimen **Form 7-2**, attached) accompanied with a copy of the certificate previously issued. The change of the specification, if any, is to be described in the application. Where the specifications of the approved equipment remain unchanged, the certificate will be issued with another 5 years valid term by the Society. Manufacturers whose renewal is approved are to return the existing certificate to the Society as soon as possible after receiving the new certificate and the term of validity of the existing certificate expires.

### 2.5 Changes in Particulars, Material, Construction, etc. of Approved Equipment

Paragraph 2.5.1 has been amended as follows.

#### 2.5.1 Changes in Particulars, Material, Construction, etc. of Approved Equipment

- 1 In case where the particulars, materials, construction, dimensions, etc. of major components of the approved equipment are intended to be changed, the manufacturer is to submit to the Society each three copies of application for changes (**Form 7-2**, attached), explanatory notes for changes and necessary drawings, accompanied with a copy of the certificate previously issued.
- 2 Upon examination of the drawings and documents, etc. according to **-1** above, a confirmation test for changes are to be carried out when considered necessary.
- 3 In case the results of confirmation tests specified in **-2** are deemed appropriate, a new certificate will be issued by the Society. In this case, the previously issued certificate is to be returned to the Society as soon as possible after receiving the new certificate.

## Chapter 6 APPROVAL OF USE OF CRANKCASE OIL MIST DETECTION ARRANGEMENTS

### 6.4 Approval

#### 6.4.2 Renewal of Approval

Sub-paragraph -2 has been amended as follows.

- 2 In case where renewal of validity is intended, the manufacturer is to submit a copy of the existing certificate in accordance with the requirements of **6.2** newly. In this case, the data required per **6.2** may be limited to the portion subjected to modification only.

Sub-paragraph -4 has been added as follows.

4 Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## **Chapter 7 APPROVAL OF USE OF GAS DETECTION EQUIPMENT**

### **7.5 Approval**

#### **7.5.3 Renewal of Approval**

Sub-paragraph -1 has been amended as follows.

**1** In case where renewal of validity is intended, the manufacturer is to submit a copy of the existing certificate, and to apply in accordance with the requirements of **7.2**. In this case, the data required per **7.2** may be limited to the portion subjected to modification only.

Sub-paragraph -3 has been added as follows.

**3** Manufacturers whose renewal is approved are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old certificate expires.

## **Part 8 TYPE TESTS OF ELECTRICAL EQUIPMENT AND CABLES**

### **Chapter 1 GENERAL**

#### **1.4 Certificate**

##### **1.4.4 Renewal of Validity**

Sub-paragraph -3 has been amended as follows.

**1** Where the validity of the certificate is intended to be renewed, the manufacturer is to undergo the periodical investigation (*see* **1.5**) after submitting an application (*see* **Form 8-1**) to the Society (Branch Office).

**2** Where the periodical investigation is postponed due to unavoidable reasons, the manufacturer is to take the steps required by the Society.

**3** Where the periodical investigation has been passed, the Society will re-issue the new certificate, the term of validity of which is 5 *years* from the date of passing the periodical investigation. Manufacturers are to return the old “Certificate of Approval” to the Society as soon as possible after receiving the new certificate and the term of validity of the old one expires.

**4** When the validity of the certificate is not intended to be renewed, the manufacturer is to notify the Society (Branch Office) in writing and immediately return the certificates of the products concerned.

#### **1.7 Verification Test**

Paragraphs 1.7.2 and 1.7.3 have been amended as follows.

##### **1.7.2 Submission of Certificate and Test Record**

The manufacturer is to submit a copy of the existing certificates and three copies each of the test records to the Society (Branch Office) immediately after completion of the verification test.

##### **1.7.3 Renewal of Certificate**

Where verification test records are considered appropriate the Society will issue the new certificate. In this case, the existing certificate is to be returned to the Society as soon as possible after receiving the new certificate.

#### **EFFECTIVE DATE AND APPLICATION (Amendment 2-2)**

- 1.** The effective date of the amendments is 25 December 2015.

## Part 2 EQUIPMENT

### Chapter 8 SEWAGE TREATMENT PLANT AND SEWAGE COMMUNITING AND DISINFECTING SYSTEM

#### 8.4 Approval Tests for Sewage Treatment Plant

Paragraph 8.4.2 has been amended as follows.

##### 8.4.2 Effluent Test

(-1 to -5 are omitted.)

6 The effluent is to be inspected as follows:

- (1) Thermotolerant Coliform  
The thermotolerant coliform count of the samples of effluents taken during the test period is not to exceed 100 thermotolerant coliforms/100 ml as determined by the membrane filter (*JIS K 0430-72-30:2000*), multiple tube fermentation (*JIS K 0430-72-40:2000*) or any other internationally accepted equivalent test standard.
- (2) Total Suspended Solids (TSS)  
The analytical procedure is to be as follows: filtrating a representative sample through a 0.45 µm filter membrane, drying at 105°C and weighing; or centrifuging a representative sample (for at least five minutes with mean acceleration of 2,800-3,200 G), drying at 105°C and weighing; or evaluating a representative sample according to some other internationally accepted equivalent test standard. The influent concentration of total suspended solids is to be no less than 500 mg/l and the effluent concentration of total suspended solids is not to exceed 35 mg/l.
- (3) 5-day Biochemical Oxygen Demand without nitrification (BOD<sub>5</sub> without nitrification)  
Analytical procedures are to be in accordance with *ISO 5815-1:2003* or other internationally accepted equivalent test standards, and the influent 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>) is not to be less than 225 mg/l and the effluent 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>) is not to exceed 25 mg/l.
- (4) Chemical Oxygen Demand (COD)  
Analytical procedures are to be in accordance with *ISO 15705:2002* or other internationally accepted equivalent test standards, and the effluent Chemical Oxygen Demand (COD) is not to exceed 125 mg/l.
- (5) pH  
Analytical procedures are to be in accordance with *JIS K 0102:201308-12* or the equivalent, and the pH of the effluent samples taken during the test period are to be between 6 and 8.5.
- (6) In cases where Chlorine or its compounds are used as a disinfectant, Free Residual Chlorine Concentration  
Analytical procedures are to be in accordance with *JIS K 0102:201308-33* or the equivalent, and the effluent Free Residual Chlorine Concentration is not to exceed 0.5 mg/l.
- (7) Any Evaporation Residue (*JIS K 0102:201308-14.2*), Volatile Solids, Volatile Suspended Solids, Evaporation Residue on Ignition (*JIS K 0102:201308-14.4*), Transparency (*JIS K 0102:201308-9*), ~~Total Phosphorous (*JIS K 0102:2008-46.3*)~~, Organic Carbon (*JIS K 0102:201308-22*), Standard Plate Count Bacteria (*JIS K 0102:201308-72.2*)  
Analytical procedures are to be in accordance with *JIS K 0102:2008* or the equivalent.

7 In the case of thermolerant coliforms, zero values should be replaced with a value of 1 thermotolerant coliform/100 ml to allow the calculation of the geometric mean. In the case of Total Suspended Solids (TSS), 5-day Biochemical Oxygen Demand without nitrification (BOD<sub>5</sub> without nitrification) and Chemical Oxygen Demand (COD), values below the detection limit should be replaced with values half the detection limit to allow the calculation of the geometric mean.

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2016.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to sewage treatment plants with the contractual delivery date to the shipyard or, in the absence of the contractual delivery date, the actual delivery date to the shipyard before 1 January 2016 on ships other than ships the keels of which are laid or which are at *a similar stage of construction* on or after 1 January 2016.  
(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is the less.

## Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS

### Chapter 1 APPROVAL OF USE OF AUTOMATIC DEVICES AND EQUIPMENT

#### 1.3 Environmental Test

##### 1.3.1 Approval Test

- (1) After the drawings and documents submitted in accordance with **1.2.1** have been examined, tests are to be carried out in accordance with the testing condition and method of **Table 7.1-1** in the presence of the Society’s surveyor, and they are to be proven to satisfy the criteria of **Table 7.1-1**.

Table 7.1-1 has been amended as follows.

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria

Test Item	Testing condition and method	Criteria
External examination	- Examine the external, structure, etc., of the equipment	- They comply with the specifications.
Operation test and performance test	- Check the operation of the equipment. - Check the self monitoring features if provided. <u>- Check through initial performance testing that the equipment (for example, electromagnetic contactors) complies with the international performance standards such as the IEC, required by the Rules, etc. Moreover, check through subsequent performance testing after environmental testing where required for each test.</u>	- The equipment operates satisfactory.
Electrical power supply failure test	- Check the operation of the equipment when the external electrical power supply is interrupted 3 <i>times</i> during 5 <i>minutes</i> . (interruption time is 30 <i>seconds</i> each time) - For computerized equipment which needs a longer time for start up, e.g. booting sequence a) The time of 5 <i>minutes</i> may be exceeded b) One additional interruption during booting is to be performed	- No abnormality is observed on loss and restoration of the electrical power supply. -No corruption of program or data is observed, where applicable.

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method		Criteria	
Electrical power supply fluctuation test	- Check the operation of the equipment when the external electrical power supply varies as shown in the following (Note: Numerical values signify percentages for the rated value)		- No abnormality is observed. - The equipment operates satisfactory. - No corruption of programme or data is observed, where applicable.	
	Fluctuation			
	<i>a.c.</i> permanent	Voltage		Frequency
	Combination 1	+6		+5
	Combination 2	+6		-5
	Combination 3	-10		+5
	Combination 4	-10		-5
	<i>a.c.</i> transient	Voltage 1.5 sec.		Frequency 5 sec.
	Combination 5	+20		+10
	Combination 6	-20		-10
	<i>d.c.</i>			Voltage
	For the equipment not related to a battery	Voltage tolerance (continuous)		$\pm 10$
		Voltage cyclic variation		5
Voltage ripple		10		
For the equipment related to a battery	For the equipment connected to a battery during charging	-25, +30		
	For the equipment not connected to a battery during charging	-25, +20		
Power supply fluctuation test	- Check the operation of the equipment when the pneumatic and the hydraulic power supplies are maintained continuously +20% and -20% of the working pressure for at least 15 minutes.		- No abnormality is observed. - The equipment operates satisfactory.	

Table7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method	Criteria		
Insulation resistance test	- Measure the insulation resistance between current carrying parts and between current parts and earth when measured with the following application voltage.	- The insulation resistance ( $M\Omega$ ) is not less than the value specified in the following.		
	Rated voltage: $V_r(V)$	Test voltage (V)	Rated voltage	Before test
	$V_r \leq 65$ $V_r > 65$	$2 \times V_r$ , min.24 500	$V_r \leq 65$ $V_r > 65$	10 10
	- Measurements are carried out before and after damp heat test, cold test, salt mist test and High voltage test. - For the equipment containing circuits in which electronic apparatus are used and the application of the test voltage is not desirable, the test voltage is applied after removing the circuits.			
High voltage test	- Apply the following test voltage, alternating of a frequency of 50 Hz or 60 Hz, between current carrying parts and between current-carrying parts connected and earth for 1 minute.	- No abnormality is observed.		
	Rated voltage: $V_r(V)$	Test voltage (V)		
	$V_r \leq 65$ $65 < V_r \leq 250$ $250 < V_r \leq 500$ $500 < V_r \leq 690$	$2 \times V_r + 500$ 1500 2000 2500		
	- For the equipment containing circuits in which electronic apparatus are used and the application of the test voltage is not desirable, the test voltage is applied after removing the circuits.			
Pressure test	- Apply the pneumatic or hydraulic pressure of 1.5 times the designed pressure.	- No abnormality is observed.		
Dry heat test	- The equipment is at an operating condition and apply the environmental condition of $+70^\circ C \pm 2^\circ C$ for <u>16 hours</u> . And check the operation of the equipment during the last hour at the test temperature and after recovery. - For the equipment except ones installed in consoles, housing etc. together with other equipment, the environmental condition of $+55^\circ C \pm 2^\circ C$ for 16 hours may be applied. <u>- For the equipment specified for more severe temperature conditions, tests are to be carried out at agreed test temperatures and durations.</u> - Detailed test methods are referred to IEC 60068-2-2.	- No abnormality is observed. - The equipment operates satisfactory.		
Damp heat test	- Apply two cycles of the environmental condition of temperature of $+55^\circ C \pm 2^\circ C$ and relative humidity of $95\% \pm 5\%$ for 24 hours every one cycle. ( <u>The start conditions for the test are <math>+25^\circ C \pm 3^\circ C</math> and at least 95% humidity.</u> The condition is to be applied during the first 12 hours, and removed during the last 12 hours.) The equipment is operating condition during complete first cycle and switched off during second cycle except for the operation test. And check the operation of the equipment during the first 2 hours of the first cycle at the environmental condition, <u>and the performance of the equipment</u> during the last 2 hours of the second cycle at the environmental condition and after recovery. <u>- The duration of the second cycle may be extended as needed to allow for verification of equipment operation.</u> - Detailed test methods are referred to Test Db of IEC 60068-2-30.	- No abnormality is observed. - The equipment operates satisfactory.		

Table7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method	Criteria						
Vibration test	- The equipment is at an operating condition and apply the sweeping of vibration specified in the following over the frequency range of 2 (+3, -0) Hz-100 Hz in order to find resonance points. (The points of which amplification factor : $Q \geq 2$ are considered as resonance points.)	- No abnormality is observed. - The equipment operates satisfactory.						
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>Amplitude or Acceleration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2 (+3, -0) Hz-13.2 Hz</td> <td style="text-align: center;">Amp. <math>\pm 1.0 \text{ mm}</math></td> </tr> <tr> <td style="text-align: center;">13.2 Hz - 100 Hz</td> <td style="text-align: center;">Acceleration <math>\pm 0.7 \text{ g}</math></td> </tr> </tbody> </table>		Frequency	Amplitude or Acceleration	2 (+3, -0) Hz-13.2 Hz	Amp. $\pm 1.0 \text{ mm}$	13.2 Hz - 100 Hz	Acceleration $\pm 0.7 \text{ g}$
	Frequency		Amplitude or Acceleration					
	2 (+3, -0) Hz-13.2 Hz		Amp. $\pm 1.0 \text{ mm}$					
	13.2 Hz - 100 Hz		Acceleration $\pm 0.7 \text{ g}$					
	- When resonance points do not exist, apply the vibration of acceleration $\pm 0.7 \text{ g}$ at 30 Hz for 90 minutes as an endurance test. - When resonance points exist, repeat the endurance test after taking measures to avoid the resonance or apply the vibration (same amplitude or acceleration of resonance point) at the resonance frequency for 90 minutes. - Where several resonance points are found close to each other, the sweeping endurance test for 120 minutes may be applied. In this case, the sweeping frequency range is from 0.8 to 1.2 times the frequency at the largest of several critical resonance points (mechanical resonance that sounds like chattering occurs or the equipment being tested may start to malfunction) where $Q \geq 2$ . - Check the operation of the equipment during the test. - The test is carried out in three axis direction. - For the equipment intended to be installed in severe vibration conditions such as near diesel engines or air compressors, the testing conditions specified below are to be applied.							
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>Amplitude or Acceleration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2 (+3, -0) Hz-25.0 Hz</td> <td style="text-align: center;">Amp. <math>\pm 1.6 \text{ mm}</math></td> </tr> <tr> <td style="text-align: center;">25.0 Hz-100 Hz</td> <td style="text-align: center;">Acceleration <math>\pm 4.0 \text{ g}</math></td> </tr> </tbody> </table>		Frequency	Amplitude or Acceleration	2 (+3, -0) Hz-25.0 Hz	Amp. $\pm 1.6 \text{ mm}$	25.0 Hz-100 Hz	Acceleration $\pm 4.0 \text{ g}$
	Frequency		Amplitude or Acceleration					
	2 (+3, -0) Hz-25.0 Hz		Amp. $\pm 1.6 \text{ mm}$					
	25.0 Hz-100 Hz		Acceleration $\pm 4.0 \text{ g}$					
- For equipment specified for more severe vibration levels (for example, equipment installed on exhaust manifolds and fuel oil injection systems of diesel engines), tests are to be carried out at agreed vibration levels, frequency ranges and durations. In such cases, the testing condition specified below may be applied as the agreed testing condition.								
<table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>Acceleration</th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">40 Hz-2000 Hz</td> <td style="text-align: center;"><math>\pm 10.0 \text{ g}</math></td> <td style="text-align: center;">600 °C</td> <td style="text-align: center;">90 minutes</td> </tr> </tbody> </table>	Frequency	Acceleration	Temperature	Duration	40 Hz-2000 Hz	$\pm 10.0 \text{ g}$	600 °C	90 minutes
Frequency	Acceleration	Temperature	Duration					
40 Hz-2000 Hz	$\pm 10.0 \text{ g}$	600 °C	90 minutes					
- Detailed test methods are referred to Test <i>Fc</i> of IEC 60068-2-6.								
Inclination test	- The equipment is at an operating condition and check the operation of the equipment with 22.5° static inclination. - The equipment is at an operating condition and check the operation of the equipment with rolling of 22.5° at period of about 10 seconds for not less than 15 minutes. - The test is carried out at athwartships and bow-and-stern inclinations. - On ships for the carriage of liquefied gases and chemicals, the emergency power supply is to remain operational with the ship flooded up to a maximum final athwartships inclination of 30°.	- No abnormality is observed. - The equipment operates satisfactory.						
Cold test	- The equipment is switched off except for the operation test and apply the environmental condition of $+5 \text{ °C} \pm 3 \text{ °C}$ for 2 hours. And check the operation of the equipment during the last hour at the test temperature and after recovery. - For the equipment installed in open decks, etc., the environmental condition of $-25 \text{ °C} \pm 3 \text{ °C}$ is applied. - Detailed test methods are referred to Test <i>Ab</i> or Test <i>Ad</i> of IEC 60068-2-1.	- No abnormality is observed. - The equipment operates satisfactory.						

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method		Criteria		
Salt mist test	- The equipment is switched off except when its operation is checked. Apply four cycles of the environmental condition of spraying NaCl liquid for 2 hours and leaving for 7 days. Check the operation of the equipment during the 7th day of each cycle and <u>the performance of the equipment during 4 to 6 hours after recovery.</u> - <u>Verify whether the deterioration or corrosion of the equipment is superficial upon completion of the test.</u> - Detailed test methods are referred to Test Kb of IEC 60068-2-52.		- No abnormality is observed. - The equipment operates satisfactory.		
Electrostatic discharge immunity test	- Check the operation of the equipment when the electrostatic discharge immunity test is carried out according to the following condition.		- Performance Criterion B <sup>(*)2</sup>		
	Contact discharge	6 kV			
	Air discharge	2, 4, 8 kV			
	Interval between single discharges	1 sec.			
	No. of Pulses	10 per polarity			
- Detailed test methods are referred to Level 3 of IEC 61000-4-2.					
Radiated radio frequency immunity test	- Check the operation of the equipment when the radiated radio frequency immunity test is carried out according to the following condition.		- Performance Criterion A <sup>(*)1</sup>		
	Frequency range	80 MHz - 2 GHz			
	Modulation	80% AM at 1 kHz			
	Field strength	10 V/m			
	Frequency sweep rate	$\leq 1.5 \times 10^{-3}$ decades/sec. (or 1% / 3sec.)			
- If for tests of equipment an input signal with a modulation frequency of 1 kHz is necessary a modulation frequency of 400 Hz may be chosen. - Detailed test methods are referred to Level 3 of IEC 61000-4-3.					
Conducted low frequency immunity test	- Check the operation of the equipment when the conducted low frequency immunity test is carried out according to the following condition. (values in round brackets are shown where the rated frequency of the equipment is 50 Hz)		- Performance Criterion A <sup>(*)1</sup>		
	Frequency range	60 Hz - 12 kHz (50 Hz - 10 kHz)			
	Test voltage (r.m.s.)	AC		10% of supply voltage	60 Hz - 900 Hz (50 Hz - 750 Hz)
				10 to 1% of supply voltage	900 Hz - 6 kHz (750 Hz - 5 kHz)
		DC		1 % of supply voltage	6 kHz - 12 kHz (5 kHz - 10 kHz)
				minimum 3V	
	Maximum power	2 W			
- Test signal voltage may be lowered as needed to maintain a maximum of 2 W. - Test circuit is shown in Fig. 7.1-1.					

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method		Criteria	
Conducted high frequency immunity test	- Check the operation of the equipment when the conducted high frequency immunity test is carried out according to the following condition.		- Performance Criterion A <sup>(*)</sup>	
	Frequency range	150 kHz - 80 MHz		
	Modulation	80% AM at 1 kHz		
	Amplitude	3 V rms		
	Frequency sweep range	$\leq 1.5 \times 10^{-3}$ decades/sec. (or 1% / 3sec.)		
	- This test is to be applied to AC, DC, I/O ports and signal/control lines. - If for tests of equipment an input signal with a modulation frequency of 1 kHz is necessary a modulation frequency of 400 Hz may be chosen. - For equipment installed in the bridge and deck zone, the following test levels are to be added.			
	Spot frequencies	2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz		
	Amplitude	10 V rms		
- Detailed test methods are referred to Level 2 of IEC 61000-4-6.				
<u>Electrical</u> <del>B</del> Burst/ <del>F</del> Fast transient immunity test	- Check the operation of the equipment when the <u>electrical</u> burst/fast transient immunity test is carried out according to the following condition.		- Performance Criterion B <sup>(*)</sup>	
	Single pulse time	5 nS (between 10% and 90% value)		
	Single pulse width	50 nS (50% value)		
	Amplitude	line on power supply port/earth: 2 kV		
		line on I/O data control and communication ports (coupling clamp): 1 kV		
	Pulse period	300 mS		
	Burst duration	15 mS		
	Duration	5 min./polarity		
- Detailed test methods are referred to Level 3 of IEC 61000-4-4.				
Surge immunity test	- Check the operation of the equipment when the surge immunity test is carried out according to the following condition. <u>- The test applies to AC and DC power ports.</u>		- Performance Criterion B <sup>(*)</sup>	
	<u>Open circuit voltage</u>	Pulse rise time		1.2 $\mu$ S ( <del>between 10% and 90% value</del> front time)
		Single pulse width		50 $\mu$ S ( <del>50%</del> time to half value)
		Amplitude (peak)		line/earth: 1 kV
	line/line: 0.5 kV			
	<u>Short circuit current</u>	Pulse rise time		8 $\mu$ S (front time)
		Single pulse width		20 $\mu$ S (time to half value)
	Repetition rate	at least 1 pulse/min.		
	No. of pulses	5 per polarity		
	- Test circuit is shown in Fig. 7.1-2 where power and signal lines are identical. - Detailed test methods are referred to Level 2 of IEC 61000-4-5.			

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method	Criteria	
Radiated emission test	- Radiated emission test is to be carried out according to the following.	- Radiated emission is to be within limits in the table.	
	- For equipment installed in the bridge and deck zone.		
	Frequency range		Quasi peak limits (dB $\mu$ V/m)
	150 kHz - 300 kHz		80 - 52
	300 kHz - 30 MHz		52 - 34
	30 MHz - 156 MHz		54
	156 MHz - 165 MHz		24
	165 MHz - 2 GHz		54
	- For equipment other than the above.		
	Frequency range		Quasi peak limits (dB $\mu$ V/m)
150 kHz - 30 MHz	80 - 50		
30 MHz - 100 MHz	60 - 54		
100 MHz - 156 MHz	54		
156 MHz - 165 MHz	24		
165 MHz - 2 GHz	54		
- Distance between equipment and antenna is to be 3 m.			
- The radiation limit at a distance of 3m from the enclosure port at the frequency range of 156 MHz to 165 MHz may be 30 dB $\mu$ V/m (peak value).			
- Detailed test methods are referred to CISPR 16-1, 16-2-3.			
Conducted emission test	- Conducted emission test is to be carried out according to the following.	- Conducted emission is to be within limits in the table.	
	- The test applies to AC and DC power ports.		
	- For equipment installed in the bridge and deck zone.		
	Frequency range		Limits (dB $\mu$ V)
	10 kHz - 150 kHz		96 - 50
	150 kHz - 350 kHz		60 - 50
	350 kHz - 30 MHz		50
	- For equipment other than the above.		
	Frequency range		Limits (dB $\mu$ V)
	10 kHz - 150 kHz		120 - 69
150 kHz - 500 kHz	79		
500 kHz - 30 MHz	73		
- Detailed test methods are referred to CISPR 16-1, 16-2-1.			
Flame retardant test	- Flame generator: a) Outer diameter of burner: 0.9 mm or below b) Length of flame: 12 mm $\pm$ 1 mm c) Gas: Butane or Propane 95 % - A flame is to be applied to flammable enclosures of equipment being tested for 30 sec., and then the flame is removed. - A wrapping tissue is laid under the equipment keeping the 200 mm $\pm$ 5 mm distance to catch any material that drips down. - Detailed test methods are referred to IEC 60695-11-5.	- No flame, no incandescence or - In the event of a flame or incandescence being present, it extinguishes itself within 30 sec. after removal of the flame without full combustion of the equipment. - Any dripping material extinguishes itself in such a way as to not ignite the wrapping tissue.	

Remarks:

- (1) A simplified test may be used instead of a performance test to verify equipment operation if such testing is sufficient to show the equipment has not suffered any deterioration and no abnormalities were caused by the individual environmental tests.
- (2) (\*1) Performance Criterion A: The Equipment Under Test (EUT) is to continue to operate as intended during and after the tests. No degradation of performance or loss of function is allowed as defined in relevant equipment standard and the technical specification published by the manufacturer.  
(\*2) Performance Criterion B: The EUT is to continue to operate as intended after the test. No degradation of

performance or loss of function is allowed as defined in the technical specification published by the manufacturer. During the test, degradation or less of function or performance which is self recoverable is however allowed but no change of actual operating state or stored data is allowed.

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

- 1.** The effective date of the amendments is 1 January 2016.
- 2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to automatic equipment other than those for which the application for approval is submitted to the Society on or after the effective date.