07-720

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 2007 AMENDMENT NO.3

Notice No.57 27th September 2007
Resolved by Technical Committee on 2nd July 2007

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NIPPON KAIJI KYOKAI

Notice No.57 27th September 2007
AMENDMENT TO THE GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMNET FOR MARINE USE

"Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use" has been partly amended as follows:

Amendment 3-1

Part 6 MACHINERY

Chapter 9 APPROVAL OF USE OF MECHANICAL JOINTS

9.3 Approval Tests

9.3.2 Details of Tests

Sub-paragraph (6) has been amended as follows:

(6) Fire endurance test
~~Mechanical joint assembly test specimen is to be subject to fire for 30 *min* at a temperature of 800℃, while water at the design pressure of the joint is circulated inside. Specimen is to be completely engulfed in the flame envelope. The water temperature measured at the outlet of the test specimen is not to be less than 80℃ during the test.~~ Fire endurance test is to be conducted in accordance with *ISO* 19921: 2005(E) and *ISO* 19922: 2005(E). After the fire testing, the specimen is to be subjected to a hydrostatic tightness test as defined in **(1)(a)** above. As an alternative, the fire test may be conducted with circulating water at a pressure of at least 0.5 *MPa* and a subsequent pressure test to twice the design pressure. Pressure and temperature during the test is to be monitored. ~~Where the mechanical joint is intended for use in systems conveying flammable fluids, there is to be no loss of pressure and visual examination should show no leakage. For services other than flammable fluids, leakage rate is not to be more than 0.2 *l/min*.~~ A selection of representative nominal bores may be tested in order to evaluate the fire resistance of a series or range of mechanical joint of the same design. When a mechanical joint of a given nominal bore (*Dn*) is so tested then other mechanical joints falling in the range *Dn* to 2 x *Dn* (both inclusive) are considered accepted.

EFFECTIVE DATE AND APPLICATION (Amendment 3-1)

1. The effective date of the amendments is 1 October 2007.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to mechanical joints other than those for which the application for approval is submitted to the Society on and after the effective date.

Amendment 3-2

Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS

Chapter 1 APPROVAL OF USE OF AUTOMATIC DEVICES AND EQUIPMENT

1.2 Application Procedures

Paragraph 1.2.1 has been amended as follows.

1.2.1 Application Procedures

The manufacturer (applicant) of the equipment intended to be applied the requirements in this chapter is to submit an application (**Form 7-1**) accompanied with three copies each of the following drawings and documents to the Society.

(1) Specifications (description of the product name, type, principal particulars, use, construction, performance, etc.)
(2) List of equipment including the similar type
(3) System diagram (when systems are composed of plural units)
(4) Construction drawings (general dimensions and sectional assembly plan, etc.)
(5) Wiring diagram (electrical systems), piping diagram (pneumatic or hydraulic systems)
(6) List of major parts (this may be included in the above **(2)** or **(4)**)
~~Note :~~
~~1.~~ (a) Product name, principal particulars, material, quantity, applicable rules and standards are to be specified.
~~2.~~ (b) Bought-in parts are to be included.
(7) Instruction manual (including operating procedure)
(8) Inspection and test specification for quality control (including test data)
(9) Past records of products
(10) Environmental test procedures prepared according to **1.3**.
(11) Certificate and test result certificate issued by bodies recognized by the Society (if any)
(12) Quality control for software
(a) Quality standards
(b) A quality plan for software lifecycle
(c) Quality assurance procedures in production
(13) Documentation of software modification
Work procedures for modifying program contents and data including upgrades

EFFECTIVE DATE AND APPLICATION (Amendment 3-2)

1. The effective date of the amendments is 1 January 2008.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to the automatic devices and equipment approved by the Society before the effective date and installed on ships for which the date of contract for construction* by the valid date of their type approval.

*"contract for construction" is defined in IACS Procedural Requirement(PR) No.29 (Rev.4).

IACS PR No.29 (Rev.4)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Notes:

1. This Procedural Requirement applies to all IACS Members and Associates.
2. This Procedural Requirement is effective for ships "contracted for construction" on or after 1 January 2005.
3. Revision 2 of this Procedural Requirement is effective for ships "contracted for construction" on or after 1 April 2006.
4. Revision 3 of this Procedural Requirement was approved on 5 January 2007 with immediate effect.
5. Revision 4 of this Procedural Requirement was adopted on 21 June 2007 with immediate effect.

Amendment 3-3

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

The following test items in Table 7.1-1 have been amended as follows.

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

Test Item	Testing condition and method	Criteria
Electrical power supply failure test	- Check the operation of the equipment when the external electrical power supply is interrupted 3 *times* during 5 *minutes*. (interruption time is 30 *seconds* each time) - For computerized equipment which needs a longer time for start up, e.g. booting sequence a) The time of 5 *minutes* 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.
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≤2~~ Q≥2 are considered as resonance points.) Frequency: 2(+3, -0) *Hz* - 13.2 *Hz* — Amplitude or Acceleration: Amplitude ± 1.0 *mm* Frequency: 13.2 *Hz* - 100 *Hz* — Amplitude or Acceleration: Acceleration ± 0.7 *g* - When resonance points do not exist, apply the vibration of acceleration	- No abnormality is observed. - The equipment operates satisfactory.

± 0.7 *g* at 30 *Hz* for 90 *minutes* as an endurance test.
- When resonance points exist, repeat ~~the test with necessary provisions~~ 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* ~~as an endurance test~~.
~~- In case of~~ Where several resonance points are found close to each other, the sweeping ~~of vibration~~ endurance test for 120 *minutes* ~~as a sweeping endurance test~~ 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≥2.
- Check the operation of the equipment during the ~~endurance~~ test.
- The test is carried out in three axis direction.
- For equipment intended to be installed in severe vibration conditions such as near diesel engines~~,~~ or air compressors, the ~~vibration level specified in the following~~ testing conditions specified below are to be applied.

Frequency	Amplitude or Acceleration
2(+3, -0) *Hz* - 25.0 *Hz*	Amplitude ± 1.6 *mm*
25.0 *Hz* - 100 *Hz*	Acceleration ± 4.0 *g*

- Detailed test methods are referred to Test *Fc* of *IEC* 60068-2-6.

<table>
<tr><td>Conducted low frequency immunity test</td><td colspan="4">- 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)</td><td>- Performance Criterion A(*1)</td></tr>
<tr><td></td><td>Frequency range</td><td colspan="3">60 Hz - 12 kHz (50 Hz - 10 kHz)</td><td></td></tr>
<tr><td></td><td rowspan="5">Test voltage
(r.m.s.)</td><td rowspan="4">AC</td><td>10% of supply voltage</td><td>60 Hz - 900 Hz
(50 Hz - 750 Hz)</td><td></td></tr>
<tr><td></td><td>10 to 1 % of supply voltage</td><td>900 Hz - 6 kHz
(750 Hz - 5 kHz)</td><td></td></tr>
<tr><td></td><td>10% of supply voltage</td><td>6 kHz - 12 kHz
(5 kHz - 10 kHz)</td><td></td></tr>
<tr><td></td><td colspan="2">minimum 3V</td><td></td></tr>
<tr><td></td><td>DC</td><td>10% of supply voltage</td><td>50 Hz - 10 kHz</td><td></td></tr>
<tr><td></td><td>Maximum power</td><td colspan="3">2 W</td><td></td></tr>
<tr><td></td><td colspan="4">- <s>Detailed test methods are referred to IEC 60533.</s> Test circuit is shown in Fig. 7.1-1.</td><td></td></tr>
</table>

<table>
<tr><td>Surge immunity test</td><td colspan="2">- Check the operation of the equipment when the surge immunity test is carried out according to the following condition.</td><td>- Performance Criterion B(*2)</td></tr>
<tr><td></td><td>Pulse rise time</td><td>1.2μS (between 10% and 90% value)</td><td></td></tr>
<tr><td></td><td>Single pulse width</td><td>50μS (50% value)</td><td></td></tr>
<tr><td></td><td>Amplitude</td><td>line/earth: 0.5 and 1 kV
line/line: 0.5 kV</td><td></td></tr>
<tr><td></td><td>Reputation rate</td><td>at least 1 pulse/min.</td><td></td></tr>
<tr><td></td><td>No. of pulses</td><td>5 per polarity</td><td></td></tr>
<tr><td></td><td colspan="2">- Test <s>procedure is to be in accordance with</s> circuit is shown in <s>Fig. 7.1-1</s> Fig. 7.1-2 where power and signal lines are identical.
- Detailed test methods are referred to Level 2 of IEC 61000-4-5.</td><td></td></tr>
</table>

The following test item has been added in the last line of Table 7.1-1.

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

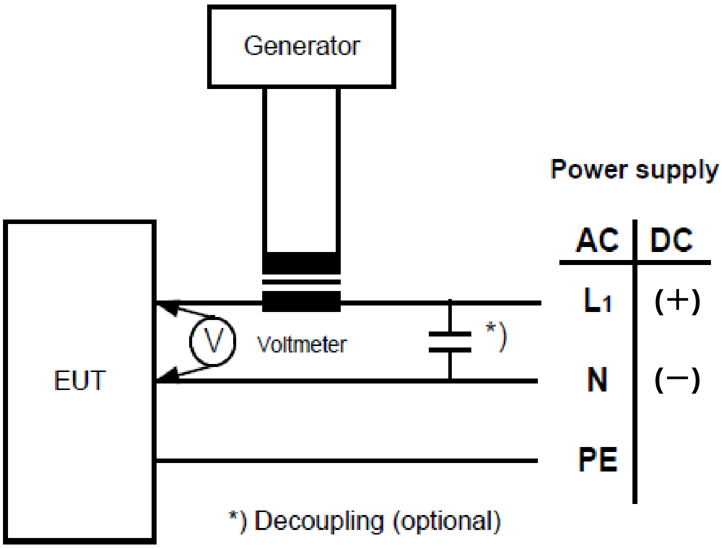
Test Item	Testing condition and method	Criteria
Flame retardant test	- Flame generator: a) Outer diameter of burner: 0.9 *mm* or below b) Length of flame: 12 *mm*±1 *mm* c) Gas: Butane or Propane 95 *%* - A flame is to be applied to flammable enclosures of equipment being tested for 30 *sec.*, and then the flame is removed. - A wrapping tissue is laid under the equipment keeping the 200 *mm*±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.

Fig. 7.1-1 has been renumbered to Fig. 7.1-2.

~~Fig. 7.1-1~~ Fig. 7.1-2 Example of Surge Immunity Test Circuits

Fig. 7.1-1 has been added.

Fig. 7.1-1 Example of Surge Immunity Test Circuits



EFFECTIVE DATE AND APPLICATION (Amendment 3-3)

1. The effective date of the amendments is 1 January 2008.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to the automatic devices and equipment approved by the Society before the effective date and installed on ships for which the application for Classification Survey during Construction is submitted by the valid date of their type approval.

Amendment 3-4

Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS

Chapter 6 APPROVAL OF USE OF CRANKCASE OIL MIST DETECTION ARRANGEMENTS

6.2 Application

6.2.2 Documents

Sub-paragraph (5)(b) has been amended as follows:

(b) Functionality tests (to demonstrate that the equipment is operational and that any faults can be identified and corrective actions notified)

6.3 Approval Tests

6.3.2 Environmental Test

Sub-paragraph (2) has been amended as follows:

(2) For the detectors:
- (a) Electrical power supply failure test
- (b) Electrical power supply fluctuation test
- (c) Dry heat test
- (d) Damp heat test
- (e) Vibration test
- (f) Insulation resistance test
- (g) High voltage test
- (h) Inclination test ~~(to be applied to equipment with moving parts)~~
- (i) Electrostatic discharge immunity test (to be applied to electronic devices)
- (j) Radiated radio frequency immunity test (to be applied to electronic devices)
- (k) Conducted low frequency immunity test (to be applied to electronic devices)
- (l) Conducted high frequency immunity test (to be applied to electronic devices)
- (m) Burst/Fast transient immunity test (to be applied to electronic devices)
- (n) Surge immunity test (to be applied to electronic devices)
- (o) Radiated emission test (to be applied to electronic devices that emit the electromagnetic wave)
- (p) Conducted emission test (to be applied to electronic devices that emit the electromagnetic wave)

Paragraph 6.3.3 has been amended as follows:

6.3.3 Functional Test

1 Two ~~sets of~~ detectors~~/monitors requiring approval~~ are to be ~~subjected to the following tests~~ tested. One ~~set~~ is to be tested in the clean condition and the other in a condition ~~that represents~~ representing the maximum degree of lens obscuration ~~that is stated as being acceptable~~ specified by the manufacturer. They are to be tested in the orientation in which they intended to be installed on an engine or gear case. Where sensitivity levels can be adjusted, testing is to be carried out at the extreme and mid-point level settings. ~~An oil mist concentration to be used for testing is to be an accuracy of ±10%.~~

2 Functional test is to be carried out by the following procedures.

(1) The concentration of an oil mist used for testing is to confirm that it is less than ±10% of the set point.

(~~1~~2) The concentration of oil mist in the test ~~vessel~~ chamber is to be measured in the top and bottom of the ~~vessel and is~~ chamber and these concentrations are not to differ by more than 10%.

(~~2~~3) It is to be verified that the oil mist detection arrangements are capable of detecting oil mist in air concentrations of between 0 and 10% of the lower explosive limit (LEL) or more than 2 times of alarm set point.

(~~3~~4) The operation of the alarm indicators for oil mist concentration in air is to be verified and is to provide an alarm at a maximum ~~setting~~ level corresponding to not more than 5% of the LEL ~~(corresponding to~~ or approximately 2.5 *mg/l*~~)~~. Where alarm set points can be altered, the means of adjustment and indication of set points are to be verified against the equipment manufacturer's instructions.

(~~4~~5) Where oil mist is drawn into a detector~~/monitor~~ via piping arrangements, the time delay between the sample leaving the crankcase and operation of the alarm is to be determined for the longest and shortest lengths of pipes recommended by the manufacturer. The pipe arrangements are to be in accordance with the manufacturer's instructions.

3 The way to generate oil mist and the way to verify concentration of the oil mist are to comply with following.

(1) Oil mist is to be generated with suitable equipment using an SAE 80 monograde mineral oil or equivalent and supplied to a test chamber having volume not less than 1 m^3. It is to be checked that the oil mist produced has a maximum droplet size of 5 μm. The oil mist chamber is to be fitted with a recirculating fan.

~~2~~(2) The oil mist concentrations are to be ascertained by the gravimetric deterministic method or equivalent. The gravimetric deterministic method is a laboratory process where the difference in weight of milipore (pore size: typically 0.8 μm) filter is ascertained from weighing the filter before and after drawing 1 ~~m^3~~ l of oil mist through the filter. The filters are to be weighed to a precision of 0.1 *mg* and the volume of the oil mist sampled to 10 *ml*. The oil mist detector is to be located adjacent to where the oil mist samples are drawn off. The results of a gravimetric analysis are considered invalid and are to be rejected in case of the following situations.

(~~1~~a) In case where the resultant calibration curve has an increasing gradient with respect to the oil mist detection~~/monitoring~~ reading. (This situation occurs when insufficient time has been allowed for the oil mist to become homogeneous.)

(~~2~~b) In case where single results of a gravimetric analysis are more than 10% below the calibration curve. (This situation occurs when the integrity of the filter unit has been compromised and not all of the oil is collected on the filter paper.)

4 Detector equipment that is in contact with the crankcase atmosphere and may be exposed to oil splash and spray from engine lubricating oil is to be demonstrated as being such, that openings do not occlude or become blocked under continuous oil splash and spray conditions. Testing is to be in accordance with arrangements proposed by the manufacturer and agreed by the Society.

5 Detector equipment may be exposed to water vapor from the crankcase atmosphere which may affect the sensitivity of the equipment and it is to be demonstrated that exposure to such conditions will not affect the functional operation of the detector equipment. Where exposure to water vapor and/or water condensation has been identified as a possible source of equipment malfunctioning, testing is to demonstrate that any mitigating arrangements such as heating are effective. Testing is to be in accordance with arrangements proposed by the manufacturer and agreed by the Society.

~~3~~6 The details of detection/monitoring devices to be tested are to be recorded. This is to include manufacturer, type designation, oil mist concentration assessment capability and alarm settings.

~~4~~7 After completing the tests, the detection/monitoring devices are to be examined and the condition of all components ascertained and documented. Photographic records of the monitoring devices condition are to be taken and included in the report.

EFFECTIVE DATE AND APPLICATION (Amendment 3-4)

1. The effective date of the amendments is 1 January 2008.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to oil mist detection arrangements other than those for which the application for approval is submitted to the Society on and after the effective date.