RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part B Class Surveys

Rules for the Survey and Construction of Steel Ships
Part B 2014 AMENDMENT NO.1
Guidance for the Survey and Construction of Steel Ships
Part B 2014 AMENDMENT NO.1

Rule No.9 / Notice No.10 26th February 2014
Resolved by Technical Committee on 29th July 2013
Approved by Board of Directors on 24th September 2013

ClassNK
NIPPON KAIJI KYOKAI

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part B Class Surveys

2014 AMENDMENT NO.1

Rule No.9 26th February 2014

Resolved by Technical Committee on 29th July 2013

Approved by Board of Directors on 24th September 2013

Rule No.9 26th February 2014
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part B CLASS SURVEYS

Amendment 1-1

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph -1(6) has been amended as follows.

1 Periodical Surveys are to be carried out in accordance with the requirements specified in **(1)** through **(6)** below.
((1) to (5) are omitted)
(6) Propeller Shaft and Stern Tube Shaft Surveys
Ordinary Surveys of ~~the~~ propeller shafts and stern tube shafts are to be carried out as specified in the following **(a)** th~~e~~rough **(d)** ~~below~~:
(a) Ordinary Surveys of Propeller shafts Kind 1 or stern tube shafts Kind 1 (hereinafter referred to as "shafts Kind 1" in this ~~C~~chapter) are to be carried out within 5 *years* from the date of completion of the Classification Survey or the previous Ordinary Survey.
(b) Regardless of **(a)** above, Ordinary Surveys of propeller shaft ~~Kind 1 (Kind 1*C*)~~ with oil-lubricated stern tube bearings~~, may be postponed for not more than 3 *years* (5 *years*) from the date of completion of Partial Survey provided that the Partial Survey specified in **8.1.2-1** or **8.1.2-2** is carried out at the time preseribed in **(a)** above~~ are to be as specified in the following **i)** and **ii):**
i) Ordinary Surveys of propeller shafts Kind 1B may be postponed for no longer than 3 *years* from the date of completion of Partial Surveys provided that the Partial Survey specified in **8.1.2-1** is carried out at the time prescribed in **(a)** above. Moreover, in cases where it is confirmed within 3 *years* from the date of completion of said Partial Survey that proper maintenance has been conducted since said Survey, Ordinary Surveys may be postponed for not more than 2 *years* from the date of the Confirmatory Survey above.
ii) Ordinary Surveys of propeller shafts Kind 1C may be postponed for no longer than 5 *years* from the date of completion of Partial Surveys provided that the Partial Survey specified in **8.1.2-2** is carried out at the time prescribed in **(a)** above.
(c) Regardless of **(a)** above, ~~The~~ propeller shafts Kind 1 adopting the preventive maintenance system in accordance with the requirements of **8.1.3**, need not be withdrawn at the Ordinary Surveys. The shafts are to be withdrawn for examination at the times required on the basis of the results of the preventive maintenance.

(d) Ordinary Surveys of Propeller shafts Kind 2 and stern tube shafts Kind 2 (hereinafter referred to as "shafts Kind 2" in this ~~C~~chapter) are to be carried out as prescribed in **i)** and **ii)**.

i) Concurrently with Special Surveys

ii) Within 36 *months* from the date of completion of the Classification Survey or the previous Ordinary Surveys

However, where the construction of the shaft in the stern tube bearing and shaft bracket corresponds to shafts Kind 1 but the construction of the shaft between the stern tube and the shaft bracket corresponds to shafts Kind 2, the shaft may be surveyed at the intervals prescribed in **(a)**, provided that examination required for the part corresponding to shafts Kind 2 is carried out at the times prescribed in **i)** and **ii)**.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 26 February 2014.

Amendment 1-2

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey During Construction

2.1.2 Submission of Plans and Documents for Approval

Sub-paragraph -1(1)(ac) has been added as follows.

(ac) Plans and arrangements showing airborne sound insulation properties of bulkheads and decks within accommodation spaces.

2.1.6 Documents to be Maintained on Board

Sub-paragraph -1(2)(q) has been added as follows.

(q) Noise survey report.

2.3 Sea Trials and Stability Experiments

2.3.1 Sea Trials

Sub-paragraph -1 has been amended as follows.

1 In the Classification Survey of all ships, sea trials specified in following **(1)** to ~~**(11)**~~**(12)** are to be carried out in full load condition, in the calmest possible sea and weather condition and in deep unrestricted water. However, where sea trials cannot be carried out in full load condition, sea trials may be carried out in an appropriate loaded condition. The noise measurements specified in **(11)** are to be carried out at either the full load condition or the ballast condition.
((1) to (10) are omitted)
(11) Noise measurements
(1~~1~~2) Other tests where deemed necessary by the Society

Chapter 3 ANNUAL SURVEYS

3.2 Annual Surveys for Hull, Equipment, Fire Extinction and Fittings

In Table B3.1, item 11 has been added as follows.

Table B3.1 Examination of Plans and Documents

Items	Examination
1～10 (Omitted)	(Omitted)
11 Noise survey report	・ Confirmation that the report is kept on board

In Table B3.2, item 23 has been added as follows.

Table B3.2 General Examination

Items	Examination
1～22 (Omitted)	(Omitted)
23 Hearing protectors	・ Confirmation that hearing protectors are in good condition

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2014.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to ships other than ships that fall under the following:

(1) for which the building contract is placed on or after 1 July 2014; or

(2) in the absence of a building contract, the keels of which are laid or which are at *a similar stage of construction* on or after 1 January 2015; or

(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.

(3) the delivery of which is on or after 1 July 2018

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part B Class Surveys

2014 AMENDMENT NO.1

Notice No.10 26th February 2014

Resolved by Technical Committee on 29th July 2013

Notice No.10 26th February 2014
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Guidance for the survey and construction of steel ships" has been partly amended as follows:

Part B CLASS SURVEYS

Amendment 1-1

B1 GENERAL

B1.1 Surveys

Paragraph B1.1.3 has been amended as follows.

B1.1.3 Intervals of Class Maintenance Surveys
(-1 to -3 are omitted)
4 At the Confirmatory Surveys for the "proper maintenance" of shafts in **1.1.3-1(6)(b)i), Part B of the Rules,** it is to be confirmed that at least at the following **(1)** through **(4)** are properly monitored and recorded, and that the lubricating conditions of the shafting system are maintained properly based upon those parameters. As for criteria for said parameters, the requirements specified in -3 "Criteria for Parameters" in Item 4 "Approval Conditions" in **Table B8.1.3-1** are to be applied mutatis mutandis.
(1) Lubricating oil sampling and analysis carried out regularly at intervals not exceeding 6 months (Each analysis is to include water content, chlorides content, shaft metal content, bearing metal particle content, and oil oxidation degree.)
(2) Lubricating oil consumption rate
(3) Bearing temperature
5 For shafts where Ordinary Surveys are postponed for 2 *years* in accordance with **1.1.3-1(6)(b)i), Part B of the Rules** the proper maintenance specified in **-4** above is to be conducted until the next Ordinary Survey.
~~**4**~~**6** The postponement of the Ordinary Surveys of propeller shafts Kind 1 and stern tube shafts Kind 1 facilitated by the Occasional Survey specified in **-3** above or the Partial Survey specified in **1.1.3-1(6)(b), Part B of the Rules**, are not to be beyond the following longest terms:
(1) 5 *years* and 6 *months* for shafts Kind 1*A*
(2) 8 *years* for shafts Kind 1*B* (10 *years* in cases where **-4** and **-5** above are complied with.)
(3) 10 *years* for shafts Kind 1*C*
~~**5**~~**7** Occasional ~~s~~Surveys specified in **1.1.3-3(5), Part B of the Rules** are as specified below:
((1) to (13) are omitted)
~~**6**~~**8** With respect to the provisions of **-5** above, for ships at beginning stage of construction, such construction began before the effective date of each Occasional Survey requirements and such ships are delivered after these effective date, the Classification Survey of such ships is regarded as either their "first survey" or their "first scheduled dry docking"; therefore, these ships need to comply with each of the requirements of Occasional Surveys by the completion date of their Classification Survey.

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

B2.1.2 Submission of Plans and Documents for Approval

Sub-paragraph -8 has been added as follows.

8 The Corrosion Resistant Steel Technical File specified in **2.1.2-12, Part B of the Rules** is to contain at least the following items:

(1) Copy of a Type Approval Certificate;

(2) Technical data including the following items:

(a) Approved welding methods and welding consumables; and

(b) Repairing methods recommended by the manufacturer (if any);

(3) Records of the application including the following items (**(a)** and **(b)** may be substituted by hull related approved drawings in cases where the required information is given in the drawings):

(a) Applied actual space and area of each compartment; and

(b) Applied product and its thickness.

B3 ANNUAL SURVEYS

B3.2 Annual Surveys for Hull, Equipment, Fire extinction and Fittings

B3.2.1 Examination of Plans and Documents

Sub-paragraph -4 has been added as follows.

(-1 and -2 are omitted)
3 The record of maintenance and repair work, which is specified in No.10 of **Table B3.1, Part B of the Rules,** is to be in accordance with the "*Guidelines for maintenance and repair of protective coatings*" (*MSC*.1/*Circ*.1330) or the "*Guidelines on procedures for in-service maintenance and repair of coating systems of cargo oil tanks of crude oil tankers*" (*MSC*.1/*Circ*.1399).
4 The record of maintenance and repair work for corrosion resistant steel, which is specified in No.10 of **Table B3.1, Part B of the Rules,** is to be in accordance with *IACS* Unified Interpretation SC258 as amended.

B3.2.3 Performance Tests

Sub-paragraph -5 has been amended as follows.

5 Inspection of Water Level Detection and Alarm Systems (refer to **13.8.5, Part D of the Rules, 13.8.6, Part D of the Rules** and **B1.1.3-~~5~~7(5)**) specified in item 9 of **Table B3.3, Part B of the Rules,** is to be carried out on the items installed on the following ships.
((1) and (2) are omitted)

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 26 February 2014.

Amendment 1-2

B9 PLANNED MACHINERY SURVEYS

B9.1 Planned Machinery Surveys

B9.1.2 Continuous Machinery Surveys (CMS)

Sub-paragraph -6 has been amended as follows.

6 Confirmatory Survey
In ships deemed by the Society as maintaining their machinery and equipment well, overhaul inspections according to the CMS Program specified in **-3** by the shipowner (or the ship management company) may forgo the open-up examination performed in the presence of Surveyors by conducting the following confirmatory surveys, provided that the machinery and equipment are overhauled as part of the ship's maintenance practices and the records from such overhauls are kept in good order. In this case, the date of the next open-up examination is to be within a 5-*year* period from the date of its last overhaul and inspection.

((1) and (2) are omitted)

(3) Timing of the confirmatory survey
A confirmatory survey is to be carried out by the ~~time~~ completion date of ~~next~~ the first periodical survey ~~from~~ after the day the item of ~~the~~ machinery and equipment intended for the confirmatory survey was overhauled and inspected ~~at sea~~.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 26 February 2014.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to the surveys for which the application is submitted to the Society before the effective date.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to the surveys for which the application is submitted to the Society before the effective date upon request by the owner.

Amendment 1-3

B1 GENERAL

B1.1 Surveys

B1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraphs (14) to (16) have been added as follows.

5 Occasional surveys specified in **1.1.3-3(5), Part B of the Rules** are as specified below:
((1) to (13) are omitted)
(14) Means of Recharging Breathing Apparatus Cylinders and Spare Cylinders
For ships at the beginning stage of construction prior to 1 July 2014, a survey is to be carried out by the first survey on or after 1 July 2014 to verify compliance with the requirements of **15.2.3, Part R of the Rules**.
(15) Fire-fighter's Communication
For ships at the beginning stage of construction prior to 1 July 2014, a survey is to be carried out by the first survey on or after 1 July 2018 to verify compliance with the requirements of **10.10.4, Part R of the Rules**.
(16) Fire-fighter's outfits
For ships equipped with self-contained compressed air breathing apparatus of fire-fighter's outfits which had been at the beginning stage of construction before 1 July 2014, a survey is to be carried out to verify that such apparatuses comply with the requirements of **23.2.1-2(2), Part R of the Rules** by the first survey on or after 1 July 2019.

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

1. The effective date of the amendments is 1 July 2014.

Amendment 1-4

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

B2.1.2 Submission of Plans and Documents for Approval

Sub-paragraph -8 has been added as follows.

8 "Airborne sound insulation properties of bulkheads and decks within accommodation spaces" in **2.1.2-1(1)(ac), Part B of the Rules** refers to the weighted sound reduction index (R_w) in **5.1**, **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"**.

B2.1.6 Documents to be Maintained on Board

Sub-paragraph -5 has been added as follows.

5 "Noise survey report" in **2.1.6-1(2)(q), Part B of the Rules** refers to the report in **4.2**, **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"**. It is recommended that documents containing the noise exposure level determined in accordance with **3.3.6**, **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"** are attached to the "Noise survey report".

B2.3 Sea Trials and Stability Experiments

Paragraph B2.3.1 has been amended as follows.

B2.3.1 Sea Trials

(-1 to -10 are omitted)

11 The noise measurements specified in **2.3.1-1.(11), Part B of the Rules** are to be in accordance with **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMETS"**.

~~11~~**12** "Tests where deemed necessary by the Society" in **2.3.1-1~~(11)~~(12), Part B of the Rules**, refers to the tests and examinations mentioned in the following **(1)** to **(7)**.

((1) to (7) are omitted)

B3 ANNUAL SURVEYS

B3.2 Annual Surveys for Hull, Equipment, Fire extinction and Fittings

B3.2.1 Examination of Plans and Documents

Sub-paragraph -4 has been added as follows.

4 "Noise survey report" in **item 11, Table B3.1 in 3.2.1, Part B of the Rules** refers to the report in **4.2**, **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMETS"**.

B3.2.2 General Examination

Sub-paragraph -6 has been added as follows.

6 "Hearing protectors" in **item 23, Table B3.2 in 3.2.1, Part B of the Rules** refers to the hearing protectors in **6.1** and **6.2**, **Annex B2.3.1-1.(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"**.

Annex B2.3.1-11(11) has been added as follows.

Annex B2.3.1-1(11) PROCEDURES FOR ON BOARD NOISE MEASUREMENTS

Chapter 1 GENERAL

1.1 General

1.1.1 General

1 This Annex is based on the mandatory requirements specified in the *Code on Noise Levels on Board Ships* adopted by *IMO Res. MSC.337(91)* (hereinafter, referred to as "the Code").

2 In addition to the requirements in this annex, recommendatory requirements are stipulated in the Code.

1.1.2 Scope

1 This Annex applies to ships of 1,600 *gross tonnage* and upward engaged on international voyages, except in cases where specified by the Administration.

2 Notwithstanding the requirement specified in **-1** above, this Annex does not apply to the following ships:

(1) Fishing vessels
(2) Pipe-laying barges
(3) Crane barge
(4) Mobile offshore drilling units
(5) Ships not propelled by mechanical means
(6) Pile driving vessels
(7) Dredgers

3 In the case of repairs, alterations and modifications of a major character and outfitting related thereto of existing ships, it is to be ensured that areas in which changes have been made are to meet the requirements of this Annex.

4 This Annex does not apply to passenger cabins and other passenger spaces, except in so far as they are work spaces and are covered by the provisions of this Annex.

5 This Annex covers only noise sources related to the ship such as machinery and propulsion, but does not include wind, wave, ice noise, alarms and public address systems, etc.

1.1.3 Dispensation

1 In cases where the requirements in this Annex cannot be complied with and the dispensation from certain requirements is granted by the Administration, the requirements in this Annex need not be satisfied.

2 For ships designed for and employed on voyages of short duration, or on other services involving short periods of operation of the ship, to the satisfaction of the Administration, the noise level limits for accommodation spaces and service spaces in **Table 4.1** may be applied only with the ship in the port condition.

1.2 Definitions

For the purpose of this Annex, the following definitions in **-1** to **-25** are to apply.

1 *Accommodation spaces* are the spaces used for cabins, offices (for carrying out ship's business), hospitals, messrooms, recreation rooms (such as lounges, smoke rooms, cinemas, gymnasiums, libraries and hobbies and games rooms) and open recreation areas to be used by seafarers.

2 *A-weighted equivalent continuous sound level* $L_{Aeq}(T)$ is the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval, T, has the same mean square sound pressure as a sound under consideration which varies with time. It is expressed in decibels A ($dB(A)$) and is given by the following equation:

$$L_{Aeq,T} = 10\log\frac{1}{T}\int_0^T \frac{p_a(t)^2}{p_0^{\,2}}dt$$

where: T = measurement time

$p_a(t)$ = A-weighted instantaneous sound pressure

$p_o = 20\ \mu P_a$ (the reference level)

3 *A-weighted sound pressure level or noise level* is the quantity measured by a sound level meter in which the frequency response is weighted according to the A-weighting curve (see *IEC* 61672-1).

4 *C-weighted equivalent continuous sound level* $L_{Ceq}(T)$ is the C-weighted sound pressure level of a continuous steady sound that within a measurement time interval, T, has the same mean square sound pressure as a sound under consideration which varies with time. It is expressed in decibels C ($dB(C)$) and is given by the following equation:

$$L_{Ceq,T} = 10\log\frac{1}{T}\int_0^T \frac{p_c(t)^2}{p_0^{\,2}}dt$$

where: T = measurement time

$p_c(t)$ = C-weighted instantaneous sound pressure

$p_o = 20\ \mu P_a$ (the reference level)

5 *C-weighted peak sound level* L_{peak} is the C-weighted maximum instantaneous sound pressure level. It is expressed in decibels C ($dB(C)$) and is given by the following equation:

$$L_{Cpeak} = 10\log\frac{P_{peak}^{\,2}}{P_0^{\,2}}$$

where: P_{peak} = C-weighted maximum instantaneous sound pressure

$P_o = 20\ \mu P_a$ (the reference level).

6 *C-weighted sound pressure level or noise level* is the quantity measured by a sound level meter in which the frequency response is weighted according to the C-weighting curve (see *IEC* 61672-1 (2002-05)).

7 *Crane barge* is a vessel with permanently installed cranes designed principally for lifting operations.

8 *Dredger* is a vessel undertaking operations to excavate bottom sediment, where the vessel has permanently installed excavation equipment.

9 *Duty stations* are those spaces in which the main navigating equipment, the ship's radio or the emergency source of power are located or where the fire recording or fire control equipment is

centralized and also those spaces used for galleys, main pantries, stores (except isolated pantries and lockers), mail and specie rooms, workshops other than those forming part of the machinery spaces and similar such spaces.

10 *Fishing vessel* is a vessel used commercially for catching fish, whales, seals, walrus or other living resources of the sea.

11 *Hearing protector* is a device worn to reduce the level of noise reaching the ears. Passive noise-cancelling headsets block noise from reaching the ear. Active noise-cancelling headphones generate a signal that cancels out the ambient noise within the headphone.

12 *Integrating sound level meter* is a sound level meter designed or adapted to measure the level of the mean squared time averaged A-weighted and C-weighted sound pressure.

13 *Machinery spaces* are any space which contains steam or internal-combustion machinery, pumps, air compressors, boilers, oil fuel units, major electrical machinery, oil filling stations, thrusters, refrigerating, stabilizing, steering gear, ventilation and air conditioning machinery, etc., and trunks to such spaces.

14 *Mobile offshore drilling unit* is a vessel capable of engaging in drilling operations for the exploration for, or exploitation of, resources beneath the seabed, such as liquid or gaseous hydrocarbons, sulphur or salt.

15 *Navigating bridge wings* are those parts of the ship's navigating bridge extending towards the ship's sides.

16 *Noise* is the all sound which can result in hearing impairment, or which can be harmful to health or be otherwise dangerous or disruptive.

17 *Noise level*. See A-weighted sound pressure level specified in **-3** above.

18 *Pile driving vessel* is a vessel undertaking operations to install pilings in the seabed.

19 *Pipe-laying barge* is a vessel specifically constructed for, or used in conjunction with, operations associated with the laying of submarine pipelines.

20 *Port condition* is the condition in which all machinery solely required for propulsion is stopped.

21 *Repairs, alterations and modifications of a major character* are means a conversion of a ship which substantially alters the dimensions, carrying capacity or engine power of the ship, which change type of the ship, which otherwise so alters the ship that, if it were a new ship, it would become subject to the relevant provisions.

22 *Sound* means the energy that is transmitted by pressure waves in air or other materials and is the objective cause of the sensation of hearing.

23 *Sound pressure level* L_p is the sound pressure level expressed in decibel (*dB*), of a sound or noise given by the following equation:

$$L_p = 10 \log \frac{p^2}{p_0^2}$$

where: p = sound pressure, in Pascal
$p_o = 20\ \mu P_a$ (the reference level).

24 *Voyages of short duration* is the voyages where the ship is not generally underway for periods long enough for seafarers to require sleep, or long off-duty periods, during the voyages.

25 *Weighted sound reduction index*, R_w, is a single number value expressed in decibels (*dB*) which describes the overall sound insulation performance (in laboratory) of walls, doors or floors provides (see *ISO* 717-1:1997 as amended by 1:2006).

Chapter 2 MEASURING EQUIPMENT

2.1 Equipment Specifications

2.1.1 Sound Level Meters

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

2.1.2 Octave Filter Set

An octave filter set is to conform to *IEC* 61260 (1995) or an equivalent standard acceptable to the Society.

2.2 Use of Equipment

2.2.1 Calibration

Sound calibrators are to comply with *IEC* 60942 (2003-01) and are to be approved by the manufacturer of the sound level meter used.

2.2.2 Check of Measuring Instrument and Calibrator

Calibrator and sound level meter is to be verified at least every two years by a national standard laboratory or a competent laboratory accredited according to *ISO* 17025 (2005) as corrected by (Cor 1:2006).

2.2.3 Microphone Wind Screen

A microphone wind screen is to be used when taking readings outside and below deck where there is any substantial air movement. The wind screen is not to affect the measurement level of similar sounds by more than 0.5 *dB*(*A*) in “no wind” conditions.

Chapter 3 MEASUREMENT

3.1 General

3.1.1 Noise Levels

1 Measurements of the A-weighted equivalent continuous sound level, $L_{Aeq}(T)$ are to be made for the purpose of ensuring compliance with **Table 4.1**.

2 Measurements of the C-weighted equivalent continuous sound level $L_{Ceq}(T)$ and the C-weighted peak sound level L_{Cpeak} are to be made in spaces where $L_{Aeq}(T)$ exceeds 85 $dB(A)$ for the purpose of determining appropriate hearing protection according to the *HML* method specified in *ISO* 4869-2:1994.

3.2 Personnel Requirements

3.2.1 Personnel Taking Measurements

The person conducting measurements is to have knowledge in the field of noise, sound measurements and the handling of the equipment used as well as training concerning the procedures specified in this Annex.

3.3 Measurement Conditions

3.3.1 Operating Conditions at Sea Trials

Measurements are to be carried out under the following conditions specified in the following **-1** to **-8**. The actual conditions during measurement are to be recorded on the noise survey report.

1 Measurements are to be taken with the ship in the loaded or ballast condition.

2 Measurements are to be taken at a course that is as straight as possible.

3 Measurements are to be taken at normal service speed and no less than 80% of the maximum continuous rating (*MCR*). Controllable pitch and Voith-Schneider propellers, if any, are to be in the normal seagoing position. This does not apply to special ship types and ships with special propulsion and power configurations.

4 All machinery, navigation instruments, radio and radar sets, etc., normally in use at normal seagoing condition and levels, including squelch are to operate throughout the measurement period. However, neither energized fog signals nor helicopter operations are to take place during the taking of these measurements.

5 Measurements in spaces containing emergency diesel engine driven generators, fire pumps or other emergency equipment that would normally be run only in emergency, or for test purposes, are to be taken with the equipment operating. Measurements are not intended for determining compliance with maximum noise level limits in **Table 4.1**, but as a reference for personal protection of seafarers carrying out maintenance, repair and test activities in such spaces.

6 Mechanical ventilation, heating and air-conditioning equipment are to be in normal operation, taking into account that the capacity is to be in accordance with the design conditions.

7 In general, doors and windows are to be closed.

8 Spaces are to be furnished with all necessary equipment. Measurements without soft furnishings may be taken but no allowance is to be made for their absence. Rechecks or follow-up readings may be taken with soft furnishings included.

3.3.2 Equipment for Long Periods of Use

1 In cases where stabilizers are provided, measurements are to be taken at positions around such machinery when in operation as well as in adjacent accommodation spaces and duty stations; moreover, such measurements are to be taken to ensure compliance with **Table 4.1**. For thrusters, etc. which are intended for short temporary use only, measurements are to be taken for reference at 40% thruster power and the ship's speed is to be appropriate for thruster operation.

2 In the case of ships with Dynamical Positioning (DP), which is intended for use under normal working conditions, additional noise measurements at the DP mode, which would approximate station-holding at or above 40% of maximum thruster power for design environmental conditions that the ship operates in, are to be made at control stations, duty stations, and accommodation spaces to ensure that the maximum noise level limits in these spaces are not exceeded.

3.3.3 Operating Conditions in Port

Measurements are to be taken in machinery spaces with the machinery operating in the port condition.

3.3.4 Environmental Conditions

1 In cases where the water depth is less than five times the draught or if there are large reflecting surfaces in the ship's vicinity, such conditions are to be noted in the noise survey report.

2 Meteorological conditions such as wind and rain as well as sea state are to be such that they do not influence the measurements. Wind force 4 and 1 *m* wave height should not be exceeded. If this cannot be achieved, the actual conditions are to be reported.

3 Care is to be taken to see that noise from extraneous sound sources does not influence the noise level on board the ship at the positions of measurement. If necessary, measured values may be corrected for steady state background noise according to the energy summation principle.

3.3.5 Measurement Procedures

1 During noise level measurements, only seafarers necessary for the operation of the ship and persons taking the measurements are to be present in the space concerned.

2 Sound pressure level readings are to be taken in decibels using an A-weighting (*dB*(*A*)) and/or C-weighting (*dB*(*C*)) filter and if necessary also in octave bands between 31.5 and 8,000 *Hz*.

3 The noise level measurements are to be taken over a time period until stable readings are found or at least 15 *seconds*.

4 Readings are to be made only to the nearest decibel. If first decimal of the *dB* reading is 5 or higher, the reading is to be made to nearest higher integer.

3.3.6 Determination of Noise Exposure

The noise exposure level of seafarers is to be determined based upon *ISO* 9612:2009.

3.3.7 Calibration

The sound level meter is to be calibrated both before and after measurements are taken.

3.4 Points of Measurement

3.4.1 Points of Measurement

Measurements are to be taken at the following **-1** to **-5**:

1 If not otherwise specified, measurements are to be taken with the microphone at a height of between 1.2 *m* and 1.6 *m* from the deck.

2 The distance between two measurement points is to be at least 2 *m*.

3 In large spaces not containing machinery, measurements are to be taken at intervals not greater than 10 *m* throughout the space including positions of maximum noise level.
4 Measurements are no to be taken closer than 0.5 *m* from the boundaries of a space.
5 Measurements are to be taken at positions where the personnel work, including at communication stations.

3.4.2 Duty Stations

The noise level is to be measured at all points where work is carried out. Additional measurements are to be taken in spaces containing duty stations if variations in noise level are thought to occur in the vicinity of the duty stations.

3.4.3 Intake and Exhaust Openings

When measuring noise levels, the microphone is, where possible, not to be placed within a 30° angle away from the direction of the gas stream and not less than a distance of 1 *m* from the edge of the intake or exhaust opening of engines, ventilation, air conditioning and cooler systems, and as far as possible from reflecting surfaces.

3.5 Measurements in Machinery Spaces

1 Measurements are to be taken at the principal working and control stations of the seafarers in the machinery spaces and in the adjacent control rooms, if any, special attention being paid to telephone locations and to positions where voice communication and audible signals are important.
2 Measurements are not normally to be taken closer than 1 *m* from operating machinery, or from decks, bulkheads or other large surfaces, or from air inlets. Where this is not possible, measurement is to be taken at a position midway between the machinery and adjacent reflecting surface.
3 Measurement is to be made at a height of between 1.2 *m* to 1.6 *m* above the deck, platform or walkway in the following locations.
(1) The following equipment, etc. at a distance of 1 *m* from, and at intervals not greater than 3 *m* around:
  (a) Main turbines or engines at each level
  (b) Main gearing
  (c) Turbo blowers
  (d) Purifiers
  (e) Electrical alternators and generators
  (f) Boiler firing platforms
  (g) Forced and/or induced draught fans
  (h) Compressors
(2) Local control stations and the machinery control rooms
(3) All other locations which would normally be visited during routine inspection, adjustment and maintenance
(4) All normally used access routes at intervals not greater than 10 *m*
(5) Workshops within the machinery space
4 Where the measured sound pressure level in *dB*(*A*) at the intervals specified -**3(1)** above does not vary significantly, it will not be necessary to record each position. However, full measurement at representative positions and at the positions of maximum sound pressure level is to be made and recorded, subject to at least four measurements being recorded at each level.

3.6 Measurements in Navigation Spaces

Measurements are to be taken on both navigating bridge wings but are to only be taken when the

navigating bridge wing to be measured is on the lee side of the ship.

3.7 Measurements in Accommodation Spaces

1 One measurement is to be taken in the middle of the space. The microphone is to be moved slowly horizontally and/or vertically over a distance of 1 *m*. Additional measurements are to be performed at other points if appreciable differences, i.e. greater than 10 *dB*(*A*), in the level of sound inside the room occur.

2 The number of measurement cabins is to be not less than 40% of total number of cabins. Cabins which are obviously affected by noise, i.e. cabins adjacent to machinery or casings, are to be considered in any case.

3 For ships with a large number of crew cabins, such as passenger/cruise ships, it will be acceptable to reduce the number of measurement positions. The selection of cabins to be tested is to be representative for the group of cabins being tested by selecting those cabins in closer proximity to noise sources.

4 On open deck, measurements are to be taken in any areas provided for the purpose of recreation.

3.8 Measurements in Normally Unoccupied Spaces

1 Measurements are to be taken in all locations with unusually high noise levels where seafarers may be exposed, even for relatively short periods, and at intermittently used machinery locations.

2 Noise levels need not be measured for normally unoccupied spaces, holds, deck areas and other spaces which are remote from sources of noise. In cargo holds, at least three microphone positions in parts of holds where personnel are likely to carry out work are to be used.

Chapter 4 MAXIMUM ACCEPTABLE SOUND PRESSURE LEVELS

4.1 General

Measurement results are to be lower than the noise level limits specified in **Table 4.1**. In large rooms with many measurement positions the individual positions are to be compared to the limits.

Table4.1 Noise level limits (unit: *dB*(*A*))

Designation of rooms and spaces	Ship size	
	1,600 up to 10,000 GT	≥10,000 GT
Work spaces		
Machinery spaces	110	110
Machinery control rooms	75	75
Workshops other than those forming part of machinery spaces	85	85
Non–specified work spaces (other work areas)	85	85
Navigation spaces		
Navigating bridge and chartrooms	65	65
Look-out posts, incl. navigating bridge wings and windows	70	70
Radio rooms (with radio equipment operating but not producing audio signals)	60	60
Radar rooms	65	65
Accommodation spaces		
Cabin and hospitals	60	55
Messrooms	65	60
Recreation rooms	65	60
Open recreation areas (external recreation areas)	75	75
Offices	65	60
Service spaces		
Galleys, without food processing equipment operating	75	75
Serveries and pantries	75	75
Normally unoccupied spaces		
Spaces referred to in section **3.8**	90	90

Note:

If the maximum noise levels in **Table 4.1** are exceeded when machinery is operating, stay is to be limited to very short periods if dispensation is granted by the Administration.

4.2 Noise Survey Reports

A noise survey report is to be made for each ship. (See **Form 1**) The measuring points are to be marked on a general arrangement plan, or on accommodation drawings and are be identified. The noise survey report is always to be carried on board and be accessible to the crew.

Chapter 5 ACOUSTIC INSULATION BETWEEN ACCOMMODATION SPACES

5.1 Sound Insulation Index

The airborne sound insulation properties for bulkheads and decks within accommodation spaces are to comply at least with the following **-1** to **-4** weighted sound reduction index (R_w) according to *ISO* Standard 717-1:1996 as amended (1:2006), part 1.

1 Cabin to cabin: R_w=35

2 Messrooms, recreation rooms, public spaces and entertainment areas to cabins and hospitals: R_w=45

3 Corridor to cabin: R_w=30

4 Cabin to cabin with communicating door: R_w=30

5.2 Measurements of Airborne Sound Insulation Properties

Airborne sound insulation properties are to be determined by laboratory tests in accordance with *ISO* 10140-2:2010, and are to be approved by the Administration or approved by the Society in accordance with **Chapter 6, Part 4 of the GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE**.

Chapter 6 HEARING PROTECTION AND WARNING INFORMATION

6.1 General

Hearing protectors in accordance with **6.2** are to be provided on ships which have spaces with nominal noise levels greater than 85 *dB*(*A*) to seafarers who are required to enter such spaces on an individual basis.

6.2 Requirements for Hearing Protectors

Hearing protectors are to be of a type such that they can reduce sound pressure levels to 85 *dB*(*A*) or less. Selection of suitable hearing protectors is to be in accordance with the *HML* method described in *ISO* 4869-2:1994. Noise cancelling technology may be used if the headsets have equivalent performance to hearing protectors in their unpowered condition.

6.3 Warning Notices

Where the noise level in machinery spaces or other spaces is greater than 85 *dB*(*A*), entrances to such spaces are to carry a warning notice comprising symbol and supplementary sign in the working language of the ship (See **Table 6.1** and **Fig. 6.1**). If only a minor portion of the space has such noise levels, the particular location(s) or equipment is to be identified at eye level, visible from each direction of access.

Table 6.1 Examples of Warning Notices (Signs)

Signs at the entrances to noisy rooms	
80-85 *dB*(*A*)	HIGH-NOISE LEVEL – USE HEARING PROTECTORS
85-110 *dB*(*A*)	DANGEROUS NOISE – USE OF HEARING PROTECTORS MANDATORY
110-115 *dB*(*A*)	CAUTION: DANGEROUS NOISE – USE OF HEARING PROTECTORS MANDATORY – SHORT STAY ONLY
>115 *dB*(*A*)	CAUTION: EXCESSIVELY HIGH-NOISE LEVEL – USE OF HEARING PROTECTORS MANDATORY – NO STAY LONGER THAN 10 MINUTES

Fig. 6.1 Examples of Warning Notices (Symbols)

Form 1 NOISE SURVEY REPORT

The following items are to be included in the noise survey report.

1 Ship Particulars

1.1 Name of ship
1.2 Port of registry
1.3 Name and address of shipowner, managing owner or agent
1.4 Name and address of shipbuilder
1.5 Place of build
1.6 IMO number
1.7 Gross tonnage
1.8 Type of ship
1.9 Ship's dimensions – length, breadth, depth, maximum draught (summer load line)
1.10 Displacement at maximum draught
1.11 Date of keel laying
1.12 Date of delivery

2 Machinery Particulars

2.1 Propulsion machinery
1 Manufacturer, type, and number of units
2 Maximum cont. rating – power (*kW*)
3 Normal designed service shaft speed (*rpm*)
4 Normal service rating – power(*kW*)
2.2 Auxiliary diesel engines
1 Manufacturer, and type
2 Output (*kW*), and number of units
2.3 Main reduction gear
2.4 Type of propeller (fixed propeller, controllable pitch propeller, Voith-Schneider propeller)
1 Number of propellers and number of blades
2 Designed propeller shaft speed (*rpm*)
2.5 Other (in the case of special propulsion and power configurations)
2.6 Engine room ventilation
1 Manufacturer, type and number of units
2 Fan diameter (*m*), fan speed (*rpm*) and variable speed (Yes/No)
3 Airflow capacity (m^3/h) and total pressure (*Pa*)

3 Measuring Instrumentation and Personnel

3.1 Instrumentation maker, type and serial No. of sound level meter, microphone, filter, windscreen, calibrator and other equipment
3.2 Calibration of sound level meter (date calibration started/finished)
- at survey by competent authority
3.3 Identification of persons/organizations carrying out measurements

4 Conditions During Measurement

4.1 Date of measurement, start time, and completion time
4.2 Ship's position during measurement
4.3 Loading condition of the ship
4.4 Conditions during measurement
1 Draught forward
2 Draught aft
3 Depth of water under keel
4.5 Weather conditions
1 Wind force
2 Sea state
4.6 Ship speed
4.7 Actual propeller shaft speed (*rpm*)
4.8 Propeller pitch
4.9 Propulsion machinery speed (*rpm*)
4.10 Propulsion machinery power (*kW*)
4.11 Number of propulsion machinery units operating
4.12 Number of diesel auxiliary engines operating
4.13 Number of turbo generators operating
4.14 Engine room ventilation speed mode (high/low/variable)
4.15 Engine load (*%MCR*)
4.16 Other auxiliary equipment operating (Ventilation, heating and air conditioning equipment in operation)

5 Measuring Data

1 Noise limits dB(A)
Measured sound pressure levels L_{Aeq} *dB*(*A*), L_{Ceq} *dB*(*C*) and L_{Cpeak} *dB*(*C*)
Note: Measurement of sound pressure level L_{Ceq} and L_{Cpeak} is to be done only in the case of exceeding 85*dB*(*A*) and hearing protectors are required.
2 Work spaces
(1) Machinery spaces
(2) Machinery control rooms
(3) Workshops
(4) Non-specified workspaces
3 Navigation spaces
(1) Navigating bridge and chartrooms
(2) Look-out posts, including navigating bridge wings and windows
(3) Radio rooms
(4) Radar rooms
4 Accommodation spaces
(1) Cabins and hospitals
(2) Messrooms
(3) Recreation rooms
(4) Open recreation areas
(5) Offices
5 Service spaces
(1) Galleys, without food processing equipment operating
(2) Serveries and pantries

6 Normally unoccupied spaces

6 Main Noise Abatement Measures (list measures taken)

7 Remarks (list any exceptions to the Code)

Name, address, place, date and signature of person taking measurements

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

1. The effective date of the amendments is 1 July 2014.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to ships other than ships that fall under the following:

(1) for which the building contract is placed on or after 1 July 2014; or

(2) in the absence of a building contract, the keels of which are laid or which are at *a similar stage of construction* on or after 1 January 2015; or

(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.

(3) the delivery of which is on or after 1 July 2018