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**UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY,
AND ENVIRONMENT-RELATED CONVENTIONS**

**Draft interpretation of the Code on noise levels on board ships on
calibration of sound instruments**

Submitted by IACS

SUMMARY

Executive summary: This document proposes a draft interpretation of paragraphs 2.1 and 2.2 of the *Code on noise levels on board ships* (resolution MSC.337(91)) to clarify the standard of calibration of the sound level meter and its field calibrator.

*Strategic direction,
if applicable:* 7

Output: 7.1

Action to be taken: Paragraph 12

Related documents: None

Introduction

1 The *Code on noise levels on board ships* (hereinafter referred to as "the Code") adopted by resolution MSC 337(91) was made mandatory as from 1 July 2014 by SOLAS regulation II-1/3-12. IACS has recently experienced different practices with respect to uniformity of calibration of the sound level meters and their accompanying field calibrators.

Discussion

2 The requirements in the Code applicable to the measurement instruments unambiguously state that the sound level meter shall be manufactured as a high precision instrument of type/class 1 according to IEC 61672-1(2002-05) (refer to paragraph 2.1.1 of the Code). The same applies to the associated field calibrator, which shall comply with IEC 60942 (2003-01) and in addition be approved by the manufacturer of the sound level meter; which in practice also means type/class 1 for field calibrator as well (refer to paragraph 2.2.1 of the Code).

3 Further, the Code requires that the same instruments shall be verified at least every two years (biennially) by a national standard laboratory, or a competent laboratory accredited according to ISO/IEC 17025:2005, as corrected by Cor.2006 (refer to paragraph 2.2.2 of the Code). It should be noted that the ISO/IEC 17025:2005, which specifies the general requirements for the competence, impartiality and consistent operation of laboratories, was withdrawn and replaced by ISO/IEC 17025:2017, which is the standard used for accreditation of calibration laboratories today. Further, it is noted that *Statement of conformity* and *decision rules* (i.e. the conclusive result of the calibration) are topics that are addressed in the latest revision of the ISO/IEC 17025 standard.

4 Normally, the sound level meter and the field calibrator are purchased together from the manufacturer as a set. In service, they are submitted together for calibration, and the accompanying field calibrator is also used by the laboratory to establish the acoustical sensitivity of the sound level meter during the calibration.

5 There are two things about the calibration requirements in paragraph 2.2.2 of the Code that has been found challenging:

- .1 no specificity as to which standard the instruments shall be calibrated, i.e. what tests shall be performed and what decision rules shall be applied for the tests; and
- .2 whether documentation of the results of the calibration shall be presented on the calibration certificate (*Statement of conformity*).

6 In practice, the owners and users of these instruments, i.e. the measurement companies, very seldom specify the specific calibration standards when they biennially submit the instruments for test and calibration to a laboratory. In most cases, it is taken for granted that the calibration laboratory, as the professional part, knows which standards are to be applied.

7 This is not a problem if the instruments are submitted for calibration to the instrument maker's own laboratories, which know well the required tests and tolerances in order to comply with the original quality of their instruments. The problem may arise when instruments are submitted to other accredited national laboratories, which are free to apply in-house simplified calibration procedures without any statement of compliance to the required quality standard of paragraph 2.1.1 and 2.2.1 of the Code.

8 The relevant group of IEC standards for the measurement equipment also include corresponding standards for calibration, IEC 61672-3:2013 for the sound level meters and IEC 60942:2003 appendix B for the field calibrators. These standards are dedicated to instruments manufactured according to the specifications of the standards IEC 61672-1 and IEC 60942. Intuitively, one should think that it goes without saying that these calibration standards are to be used for instruments that already are manufactured to IEC 61672-1 and IEC 60942. The aim of these calibration standards is to ensure that periodic testing is performed in a consistent manner by all laboratories.

9 As the calibration to the full extent of the said IEC standards is rather expensive, it is competition-distorting if some measurement companies calibrate their instruments in a much simpler way without all the required tests for type/class 1 instruments and without any decisive conclusion.

Proposal

10 Considering the discussion in paragraphs 2 to 9 above, IACS proposes an interpretation, contained in the annex, for consideration by the Sub-Committee.

11 The draft interpretation aims to make it clear to all stakeholders involved, i.e. measurement companies, calibration institutes and the classification societies/recognized organizations, against which standard the calibration of the sound level meter and its field calibrator shall be carried out. High precision quality instruments like a class 1 sound level meter and field calibrator shall be calibrated to standards that ensure that they still comply with all the class 1 requirements after years in service.

Action requested of the Sub-Committee

12 The Sub-Committee is invited to consider the foregoing, the proposal in paragraph 10 and the draft interpretation set out in the annex, and take action, as appropriate.

ANNEX

DRAFT UNIFIED INTERPRETATION OF THE CODE IN RESPECT OF CALIBRATION OF SOUND INSTRUMENTS

SECTION 2 OF THE CODE ON NOISE LEVELS ON BOARD SHIPS (RESOLUTION MSC.337(91))

"2.1 Equipment specifications

2.1.1 Sound level meters

Measurement of sound pressure levels shall be carried out using precision integrating sound level meters subject to the requirements of this chapter. Such meters shall be manufactured to IEC 61672-1(2002-05)¹ type/class 1 standard as applicable, or to an equivalent standard acceptable to the Administration².

¹ Recommendation for sound level meters.

² Sound level meters class/type 1 manufactured according to IEC 651/IEC 804 may be used until 1 July 2016.

2.2 Use of equipment

2.2.1 Calibration

Sound calibrators shall comply with the standard IEC 60942 (2003-01) and shall 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 shall 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)."

Interpretation

The calibration should be carried out in accordance with IEC 61672-3 for sound level meters and IEC 60942 appendix B for field calibrators. The edition of the calibration standard should correspond with the edition of the manufacturing standard for the instruments. The measurement company should provide documentation about the standard which has been met if not clearly marked on the sound level meter or field calibrator. The documentation or marking should include a clear statement of the results of the periodic tests and which performance class the instrument meets after calibration.