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RESOLUTION A.382(X)
adopted on 14 November 1977

MAGNETIC COMPASSES
CARRIAGE AND PERFORMANCE STANDARDS

THE ASSEMBLY,

NOTING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

BEARING IN MIND the provisions of Regulation 12 of Chapter V of the International Convention for the Safety of Life at Sea, 1974,

NOTING FURTHER the Report of the Maritime Safety Committee on its thirty-second session concerning amendments to the provisions of the International Convention for the Safety of Life at Sea, 1960,

HAVING CONSIDERED the Report of the Maritime Safety Committee on its thirty-fourth session,

RESOLVES:

- (a) to adopt the Recommendation on the Carriage of Magnetic Compasses set out at Annex I to this Resolution;
- (b) to adopt the Recommendation on Performance Standards for Magnetic Compasses set out at Annex II to this Resolution;
- (c) to recommend that Member Governments put into effect the provisions of this Resolution and its Annexes and ensure that magnetic compasses installed after the adoption of this Resolution conform to performance standards not inferior to those shown in Annex II to this Resolution,

INVITES Governments to propose at an appropriate time an amendment to Regulation 12, Chapter V of the International Convention for the Safety of Life at Sea, 1974, embodying the provisions of Annex I to this Resolution.

ANNEX I

RECOMMENDATION ON THE CARRIAGE
OF MAGNETIC COMPASSES

Member Governments are recommended to ensure that:

1. All ships are fitted with:
 - (a) a standard magnetic compass, as defined in Annex II;
 - (b) a steering magnetic compass, as defined in Annex II, unless the heading information provided by the standard compass, required under sub-paragraph (a), is made available and clearly readable by the helmsman at the main steering position;
 - (c) adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration.
2. A spare magnetic compass, interchangeable with the standard compass, is carried, unless the steering compass mentioned in sub-paragraph 1(b) or gyro compass is fitted.
3. Each magnetic compass is properly compensated and its table or curve of residual deviations is available on board in the vicinity of the compass at all times.

Note: The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt any ship from these requirements if the nature of the voyage, the ship's proximity to land or the type of ship does not warrant a standard compass, provided that a suitable steering compass will in all cases be required.

ANNEX II

RECOMMENDATION ON PERFORMANCE STANDARDS
FOR MAGNETIC COMPASSES

1. Definitions

- 1.1 A magnetic compass is an instrument designed to seek a certain direction in azimuth and to hold that direction permanently, and which depends, for its directional properties, upon the magnetism of the earth.

1.2 The standard compass is a magnetic compass used for navigation, mounted in a suitable binnacle containing the required correcting devices and equipped with a suitable azimuth reading device.

1.3 The steering compass is a magnetic compass used for steering purposes mounted in a suitable binnacle containing the required correcting devices.

Note: If the transmitted image of a sector of the standard compass card of at least 15° to each side of the lubber mark is clearly readable for steering purposes at the main steering position, both in daylight and artificial light according to 7.1, the standard compass can also be regarded as the steering compass.

2. Compass Card

2.1 The compass card should be graduated in 360 single degrees. A numerical indication should be provided every ten degrees, starting from North (000°) clockwise to 360° . The cardinal points should be indicated by the capital letters N, E, S and W. The North point may instead be indicated by a suitable emblem.

2.2 The directional error of the card, composed of inaccuracies in graduation, eccentricity of the card on its pivot and inaccuracy of orientation of the card on the magnetic system should not exceed 0.5° on any heading.

2.3 The card of the steering compass should clearly be readable both in daylight and artificial light at a distance of 1.4 m. The use of a magnifying glass is permitted.

3. Materials

3.1 The magnets used in the directional system and the corrector magnets for correcting the permanent magnetic fields of the ship should have a high coercivity of at least $11.2 \frac{kA}{m}$.

3.2 Material used for correcting induced fields should have a low remanence and coercivity.

3.3 All other materials used in the magnetic compass and in the binnacle should be non-magnetic, so far as reasonable and practicable and such that the deviation of the card caused by these materials should not exceed $(\frac{2}{H})^\circ$, where H is the horizontal component of the magnetic flux density in μT (micro Tesla) at the place of the compass.

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4. Performance

The magnetic compass equipment should operate satisfactorily and remain usable under the operational and environmental conditions likely to be experienced on board ships in which it is installed.

5. Constructional Error

5.1 With the compass rotating at a uniform speed of 1.5° per second and a temperature of the compass of $20^\circ\text{C} \pm 3^\circ\text{C}$ the deflection of the card should not exceed $(\frac{36}{H})^\circ$, if the diameter of the card is less than 200 mm. If the diameter of the compass card is 200 mm or more, the deflection of the card should not exceed $(\frac{54}{H})^\circ$; H being defined as in sub-paragraph 3.3.

5.2 The error due to friction should not exceed $(\frac{3}{H})^\circ$ at a temperature of $20^\circ\text{C} \pm 3^\circ\text{C}$; H being defined as in sub-paragraph 3.3.

5.3 With a horizontal component of the magnetic field of $18 \mu\text{T}$ the half period of the card should be at least 12 seconds, after an initial deflection of 40° . The time taken to return finally to within $\pm 1^\circ$ of the magnetic meridian should not exceed 60 seconds after an initial deflection of 90° . Aperiodic compasses shall comply with the latter requirements only.

6. Correcting Devices

6.1 The binnacle should be provided with devices for correcting semicircular and quadrantal deviation due to:

- (a) the horizontal components of the ship's permanent magnetism;
- (b) heeling error;
- (c) the horizontal component of the induced horizontal magnetism;
- (d) the horizontal component of the induced vertical magnetism.

6.2 The correcting devices provided in sub-paragraph 6.1 should ensure that no serious changes of deviation occur under the influence of the conditions described in paragraph 4 and particularly considerable alteration of magnetic latitude. Sextantal and deviations of higher order should be negligible.

7. Construction

7.1 Primary and emergency illumination should be installed so that the card may be read at all times. Facilities for dimming should be provided.

7.2 With the exception of the illumination, no electrical power supply should be necessary for operating the magnetic compass.

7.3 In the case where an electrical reproduction of the indication of the standard compass is regarded as a steering compass, the transmitting system should be provided with both primary and emergency electrical power supply.

7.4 Equipment should be constructed and installed in such a way that it is easily accessible for correcting and maintenance purposes.

7.5 The compass, binnacle and azimuth reading device should be marked to the satisfaction of the Administration.

7.6 The standard compass should be suspended in gimbals so that its verge ring remains horizontal when the binnacle is tilted up to 40° in any direction, and so that the compass cannot be dislodged under any condition of sea or weather. Steering compasses suspended in gimbals should meet the same requirements. If they are not suspended in gimbals they should have a freedom of the card of at least 30° in all directions.

7.7 Material used for the manufacture of magnetic compasses should be of sufficient strength and be to the satisfaction of the Administration.

8. Positioning

8.1 The magnetic compass equipment should be installed if practicable and reasonable on the ship's centre line. The main lubber mark should indicate the ship's heading with an accuracy of $\pm 0.5^{\circ}$.

8.2 The standard compass should be installed so that from its position the view is an uninterrupted as possible, for the purpose of taking horizontal and celestial bearings. The steering compass should be clearly readable by the helmsman at the main steering position.

8.3 The magnetic compasses should be installed as far as possible from magnetic material.

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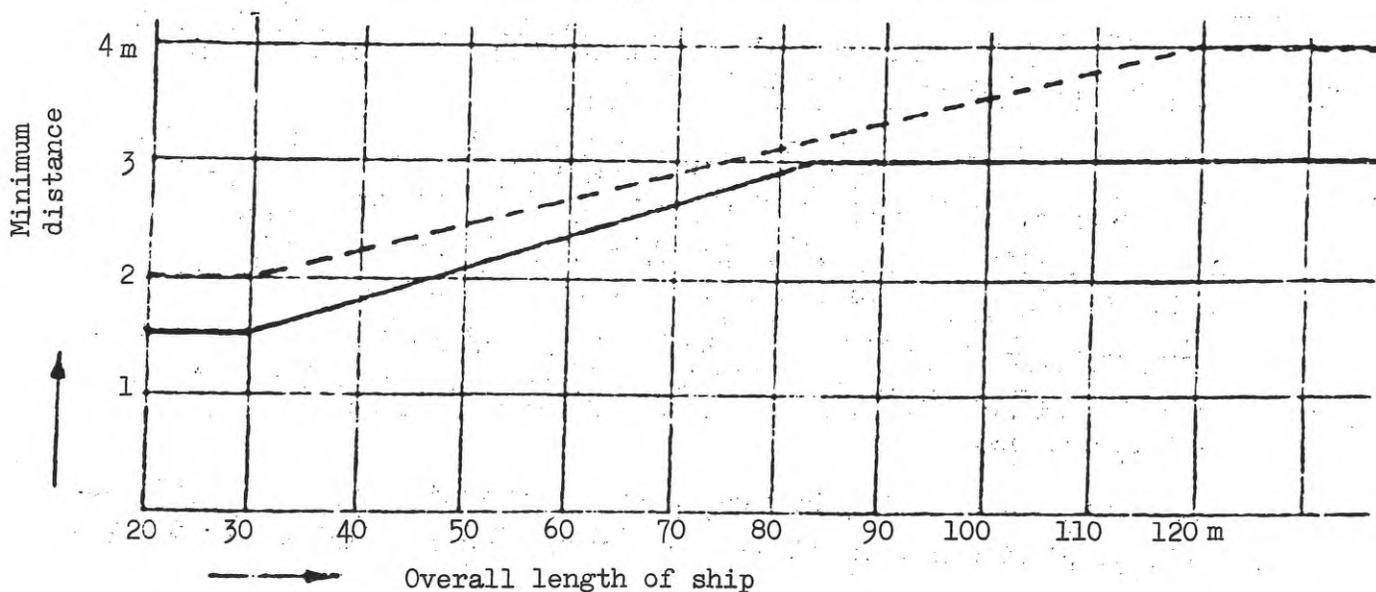
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The minimum distances of the standard compass from any magnetic material which is part of the ship's structure should be to the satisfaction of the Administration. The following diagram gives general guidelines to indicate the minimum desirable distances from the standard compass.

The minimum desirable distances for the steering compass may be reduced to 65 per cent of the values given by the diagram provided that no distance is less than 1 m. If there is only a steering compass the minimum distances for the standard compass should be applied as far as practicable.

Diagram

Minimum desirable distances from the Standard Compass



- Uninterrupted fixed magnetic material
- - - - - End parts of fixed magnetic material such as top edges of walls, partitions and bulkheads, extremities of frames, girders, stanchions, beams, pillars and similar steel parts. Magnetic material subject to movement at sea such as davits, ventilators, steel doors, etc. Large masses of magnetic material with variable fields such as funnels.

8.4 The distance of the magnetic compass from electrical or magnetic equipment should be at least equal to the safe distance specified for the equipment and be to the satisfaction of the Administration.

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