

Secondary Legislation

DCE - MTI 3K - 1/1

Maritime Transport (Navigation Systems and Equipment) Instrument [year]

DRAFT FOR CONSULTATION

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Section 1 Preliminary provisions

1.1 Title

This MTI is the Maritime Transport (Navigation Systems and Equipment) Instrument [year].

1.2 Commencement

This MTI comes into force on [same date as Part 3K].

1.3 What this MTI does

This MTI specifies standards and requirements for the carriage, design, construction, performance, installation, servicing, repair, and maintenance of navigation systems and equipment and supporting accessories and related certification requirements, for the purposes of Part 3K.

1.4 Application

This MTI specifies—

- (a) requirements with which a ship described in rule 3K: A1.3(1) must comply; and
- (b) standards that are, for the purposes of rule 3K: D1.1(1), the relevant design, construction, and installation standards and requirements.

1.5 Interpretation

- (1) If there is a conflict between this MTI and material incorporated by reference in this MTI, the MTI applies.
- (2) A term that is used in this MTI and defined in Part 3K has the same meaning as in that Part.
- (3) In this MTI, codes, conventions, and official standards (such as *NBS* and *ISO* standards) are referred to as standards and by the abbreviations listed in the Appendix.
- (4) In this MTI, unless the context otherwise requires,—

AIS means an automatic identification system

ARPA means automatic radar plotting aid

ATA means automatic tracking aid

BNWAS means a bridge navigational watch alarm system

GNSS means Global Navigation Satellite System

Part 3K means Maritime (Design, Construction, and Equipment – Navigation Systems and Equipment) Rules.

S-band radar means a radar system that—

- (a) operates in the approximate frequency range of 2 GHz to 4 GHz, corresponding to wavelengths of approximately 750 to 1,500 millimetres; and
- (b) is designed to maintain target detection and tracking in adverse environmental conditions including fog, rain, and sea clutter; and
- (c) provides a greater detection range than an x-band radar

THD means a transmitting heading device that electronically provides information about the ship's true heading

X-band radar means a radar system that—

- (a) operates in the approximate frequency range of 8 GHz to 12 GHz, corresponding to wavelengths of approximately 250 to 3,750 millimetres; and

- (b) is designed to provide high discrimination, sensitivity, and tracking performance for navigation and collision avoidance.

1.6 Transitional application

- (1) This MTI applies subject to any transitional, savings, and related provisions specified in Part 3K.
- (2) Where a transitional provision in Part 3K permits compliance with an earlier standard, that provision prevails over the requirements of this MTI.

Section 2 Ship navigation systems and equipment requirements

2.1 Application of requirements for navigation systems and equipment

This Section specifies requirements for navigation systems and equipment for the purposes of rule 3K: D1.1.

2.2 Heading and position systems and equipment

A ship must carry the navigation systems and equipment required for its Navigation Category as specified in this Section (a summary of which is in Table 2.1).¹

2.3 Navigation Category 1 ships

Compasses

- (1) A Navigation Category 1 ship must be fitted with a magnetic compass that is permanently installed as close as reasonably practicable to the ship's centre line.
- (2) If a ship uses a tiller as its primary means of steering, and a suitable permanent mounting location is not available, the ship is not required to have a permanently installed magnetic compass and may instead comply by carrying a handheld magnetic compass.

Binoculars

- (3) A Navigation Category 1 ship of more than 6 metres in LOA, or 6 metres or less in LOA operating at night, must carry a pair of binoculars fitted with a neck strap.

2.4 Navigation Category 2 ships

Compasses

- (1) A Navigation Category 2 ship must comply with subclauses (2) to (6).
- (2) A ship must be fitted with a steering compass that is—
 - (a) either a magnetic compass or an electronic compass; and
 - (b) located forward of the steering wheel or main control position; and
 - (c) clearly visible from the main steering position.
- (3) In addition to the steering compass required by subclause (2), a ship must be fitted with a separate magnetic compass, if—
 - (a) the steering compass is magnetic but is not located—
 - (i) as near as practicable to the ship's centre line; or
 - (ii) in a position where the view of the horizon is least obstructed; or
 - (b) the steering compass is an electronic compass.

¹ Table 2.1 is a summary only. In the event of inconsistency, clauses 2.3 to 2.7 prevail.

- (4) The magnetic compass required under subclause (3) must be located—
- (a) as near as practicable to the ship's centre line; and
 - (b) in a position where the view of the horizon is least obstructed.

BNWAS for ships of 24 metres or more

- (5) A ship of 24 metres or more in LLL must be fitted with a BNWAS.

Binoculars

- (6) A Navigation Category 2 ship must carry a pair of binoculars fitted with a neck strap.

2.5 Navigation Category 3 ships

- (1) A Navigation Category 3 ship must comply with subclauses (2) to (7).

Compasses

- (2) A ship must be fitted with 2 compasses, comprising—
- (a) 1 magnetic compass; and
 - (b) 1 of the following:
 - (i) a second magnetic compass;
 - (ii) an electronic compass;
 - (iii) a gyro-compass.
- (3) The 2 compasses required under subclause (2) must be arranged as either—
- (a) 1 compass that provides heading information readable from the main steering position and a second compass that is interchangeable with it; or
 - (b) 1 compass together with 1 steering compass.

Ships operating in unlimited areas

- (4) If a ship is of 300 gross tonnage or more and proceeds into the unlimited area, it must be fitted with—
- (a) an echo-sounding device; and
 - (b) a GNSS receiver; and
 - (c) a radar that is an S-band radar installation; and
 - (d) an AIS.

GNSS for passenger ships

- (5) A ship must be fitted with a GNSS receiver if it is a passenger ship carrying more than 12 passengers.

BNWAS for ships of 24 metres or more

- (6) A ship that is of 24 metres or more in LLL must be fitted with a BNWAS.

Binoculars

- (7) A Navigation Category 3 ship must carry a pair of binoculars fitted with a neck strap.

2.6 Navigation Category 4 ships

- (1) A Navigation Category 4 ship must comply with subclauses (2) to (19).

Compasses

- (2) A ship must be fitted with 2 compasses, comprising—
 - (a) 1 magnetic compass; and
 - (b) 1 of the following:
 - (i) an electronic compass;
 - (ii) a gyro-compass.
- (3) If a ship of 1,600 gross tonnage or more carries a gyro-compass, it must also be fitted with—
 - (a) 1 or more gyro-repeaters positioned to allow bearings to be taken over the widest practicable portion of the horizon, over a full 360-degree arc; and
 - (b) equipment that enables bearings to be taken from each gyro-repeater, including azimuth mirrors, azimuth circles, or sight vanes.
- (4) A compass required in subclause (2) must be readable from the main steering position or be fitted with a gyro-repeater or other suitable heading repeater at the main steering position.

Indicators

- (5) A ship must be fitted with the following:
 - (a) a rudder angle indicator, located at the main steering position if the ship is fitted with power-operated steering gear;
 - (b) a propeller shaft revolution indicator for each propeller;
 - (c) a pitch and operational mode indicator for each variable pitch propeller and lateral thrust propeller if such propellers are fitted.

Signalling daylight lamps

- (6) A ship must carry a signalling daylight lamp, or another means to communicate by light at any time, supported by an alternative source of electrical power that complies with Part 3F: Maritime (Design, Construction, and Equipment – Electrical) Rules [year]².

THD

- (7) A ship must be fitted with a properly adjusted THD that provides heading information and a GNSS-based THD may be used for this purpose.

Radars

- (8) A ship must be fitted with at least 1 radar installation if the ship is a non-passenger ship and, if a ship does not proceed into the unlimited area, the radar must be an X-band radar installation.

Automatic radar plotter

- (9) A ship must be fitted with an automatic radar plotter.

ATA

- (10) A ship must be fitted with an ATA or other means, to plot automatically the range and bearing of other targets to determine collision risk.

² Draft Rule Part 3F consulted on in 2025.

Ships 3,000 gross tonnage or more

- (11) A ship of 3,000 gross tonnage or more must be fitted with a second automatic tracking aid, or other means, that—
- (a) is functionally independent of the system required by subclause (10); and
 - (b) automatically plots the range and bearing of other targets to determine collision risk.

Ships 10,000 gross tonnage or more

- (12) A ship of 10,000 gross tonnage or more must be fitted with—
- (a) an ARPA, or other means providing equivalent functionality, connected to a device to indicate speed and distance through the water and capable of—
 - (i) automatically plotting the range and bearing of at least 20 other targets; and
 - (ii) determining collision risks; and
 - (iii) simulating a trial manoeuvre situation; and
 - (b) a heading or track control system, or equivalent means, to automatically control and maintain a heading or straight track; and
 - (c) a device to indicate speed and distance through the water.

Ships 50,000 gross tonnage or more

- (13) A ship of 50,000 gross tonnage or more must be fitted with—
- (a) a rate-of-turn indicator, or equivalent means; and
 - (b) a speed and distance measuring device, or equivalent means, that indicates speed and distance over the ground in both the forward and athwartships directions.

GNSS

- (14) A ship must be fitted with a GNSS receiver.

Echo-sounding device

- (15) A ship must be fitted with an echo-sounding device capable of measuring the depth of water beneath the ship.

Communication equipment for emergency steering position

- (16) If a ship has an emergency steering position, it must be fitted with a fixed—
- (a) means of communication, such as a telephone, that enables heading information to be relayed between the emergency steering position and the bridge or navigation position; and
 - (b) a gyro-compass heading repeater, or an equivalent heading system, that is positioned at the emergency steering system and capable of visually displaying information from the bridge or navigation position.

AIS

- (17) A ship must be fitted with an AIS that—
- (a) automatically transmits accurate ship information, including identity, position, course, speed, navigational status, and other safety-related data, to other ships, shore stations, and aircraft; and
 - (b) automatically receives equivalent information from other AIS-equipped ships; and
 - (c) enables continuous monitoring and tracking of ship traffic; and

- (d) operates continuously while the ship is underway, unless the master reasonably believes that continuous operation would compromise safety or security; and
- (e) is not interfered with or disabled.

BNWAS

- (18) A ship must be fitted with a BNWAS.

Binoculars

- (19) A Navigation Category 4 ship must carry a pair of binoculars fitted with a neck strap.

2.7 Equipment to determine position

- (1) A ship that proceeds into the unlimited area must carry—
- (a) a sextant and chronometer; or
 - (b) an electronic navigational aid fitted to the ship that enables the master and crew to accurately determine the ship's latitude and longitude.
- (2) A ship is not required to carry a chronometer under subclause (1)(a) if it is fitted with a device capable of maintaining accurate and reliable timekeeping over extended periods and in all operating conditions.
- (3) If a ship carries an electronic navigational aid under subclause (1)(b), it must have an alternative source of electrical power that complies with Part 3F: Maritime (Design, Construction, and Equipment – Electrical) Rules [year].

Table 2.1: Navigation systems & equipment requirements according to Navigation Category

Equipment / System	Navigation Category 1	Navigation Category 2	Navigation Category 3	Navigation Category 4
Binoculars	Required if > 6 metres. Required if ≤6 metres operating at night.	Required.	Required.	Required.
Magnetic compass	Required (permanently installed). Handheld only if tiller-steered.	1 magnetic compass required. If 2 compasses required, 1 magnetic.	2 compasses in total required, 1 magnetic.	2 compasses in total required, 1 magnetic.
Steering compass	Not required.	Required (magnetic or electronic). Must be forward of wheel, visible.	Required (magnetic, electronic, or gyro).	Required (magnetic, electronic, or gyro) or a suitable heading repeater.
Additional compass	Not required.	Required if steering electronic compass or poorly located.	Required (magnetic, electronic, or gyro).	Required (electronic or gyro).
Gyro-compass	Not required.		Optional (counts as second compass).	Optional; if fitted ≥1600 GT, gyro-repeaters and bearing equip required.
BNWAS	Not required.	Required if ≥24 m LLL.	Required if ≥24 m LLL.	Required for all.
Radar	Not required.		Required if ≥300 GT and proceeds into unlimited area.	1 radar (non-passenger).
Automatic radar plotter / ARPA / ATA	Not required.		Not required.	Automatic radar plotter required. ARPA if ≥10,000 GT. 2 ATA if ≥3,000 GT.
GNSS receiver	Not required.		Required if passenger ship >12 passengers. Required if ≥300 GT and unlimited area.	Required.
Echo-sounding device	Not required.		Required if ≥300 GT and unlimited area.	Required.
Speed & distance log	Not required.			Required if ≥10,000 GT.
THD	Not required.			Required.
Rudder angle indicator	Not required.			Required if power-operated steering gear is fitted.
Propeller RPM indicator	Not required.			Required for each propeller.
Pitch / Mode indicators	Not required.			Required for variable-pitch and lateral-thrust propellers.
Signalling daylight lamps or alternative	Not required.			Required.
Emergency steering comms	Not required.			Required: comm link plus heading repeater.
AIS	Not required.		Required if ≥300 GT and unlimited area.	Required.
Sextant / Chronometer/ Electronic nav aid	Not required		Required when ship in unlimited area and no electronic navigational aid	Not required

Section 3 Performance standards and technical requirements

3.1 Application of performance standards and technical requirements

This Section specifies performance standards and technical requirements for navigation systems and equipment for the purposes of rules 3K: B1.1(1) to B1.1 (2)(d) and D3.1(3).

3.2 Performance standards and technical requirements

Magnetic compass requirements for Navigation Category 1 ships

- (1) A magnetic compass on a Navigation Category 1 ship must—

- (a) be a liquid-filled compass with a floating card; and
- (b) have an apparent card diameter of at least 100 millimetres readable from the steering position.

Magnetic compasses requirements for Navigation Category 2 ships

- (2) A magnetic compass on a Navigation Category 2 ship must comply with 1 of the following standards:

- (a) ISO 14227:
- (b) ISO 25862.

Magnetic compasses requirements for Navigation Category 3 and Navigation Category 4 ships

- (3) A magnetic compass on a Navigation Category 3 ship or a Navigation Category 4 ship must comply with each of the following standards:

- (a) IMO Resolution A.382(X):
- (b) ISO 25862.

Electronic compasses

- (4) An electronic compass on a ship must have an alternative source of electrical power that complies with Part 3F: Maritime (Design, Construction, and Equipment – Electrical) Rules [year].

- (5) An electronic compass on a ship must comply with all of the following standards:

- (a) IMO Resolution A.694(17):
- (b) IMO Resolution MSC.114(73):
- (c) IMO Resolution MSC.116(73):
- (d) IMO Resolution MSC.166(78).

- (6) An electronic compass must,—

- (a) if it is a fluxgate compass comply with—
 - (i) IMO Resolution MSC. 116(73); or
 - (ii) IMO Resolution MSC.166(78), if fitted on or after 1 July 2002.
- (b) if it is a satellite compass, comply with all of the following standards:
 - (i) IMO Resolution A.819(19):
 - (ii) IMO Resolution MSC.74(69):
 - (iii) IMO Resolution MSC.113(73):
 - (iv) IMO Resolution MSC.114(73):

(v) *IMO Resolution MSC.115(73)*:

(vi) *IMO Resolution MSC.233(82)*:

(vii) *IMO Resolution MSC.379(93)*:

(viii) *IMO Resolution MSC.401(95)*.

- (7) If the requirements in subclause (5) conflict with the requirements in subclause (6), the requirements in subclause (6) apply.

Electronic navigational aids

- (8) An electronic navigational aid must comply with subclauses (4) to (7), and any reference to an electronic compass is to be read as a reference to an electronic navigational aid.

Note: This means that electronic navigational aids must meet the same performance standards and technical requirements as electronic compasses.

Electrical interference

- (9) Portable electrical and electronic systems and equipment on a ship must not be operated on the bridge or main steering position if it affects the proper function of navigation systems and equipment.

Gyro-compasses

- (10) A gyro-compass on a ship must comply with *IMO Resolution A.424(XI)*.

Indicators

- (11) The indicators on a ship must comply with *IMO Resolution A.694(17)* and must be readable from the conning position.

Radars

- (12) A radar installation on a ship must,—
- (a) comply with *Annex 4 of IMO Resolution MSC.64(67)*; or
 - (b) if fitted on or after 1 July 2008, comply with *IMO Resolution MSC.192(79)*.

Echo-sounding device

- (13) An echo-sounding device on a ship must—
- (a) comply with *IMO Resolution A.224(VII)*; or
 - (b) if fitted after 1 January 2001, comply with *IMO Resolution MSC.74(69)*.

GNSS receiver

- (14) A GNSS receiver on a ship must comply with 1 of the following:
- (a) *IMO Resolution MSC.112(73)*;
 - (b) *IMO Resolution MSC.113(73)*;
 - (c) *IMO Resolution MSC.115(73)*;
 - (d) *IMO Resolution MSC.401(95)*.

Speed and distance measuring device

- (15) A device on a ship that indicates speed and distance must comply with the requirements of *IMO Resolution MSC.74(69)*.

ARPA

- (16) An ARPA on a ship must comply with *IMO Resolution A.823(19)*.

AIS

- (17) An AIS on a ship must comply with 1 of the following:
- (a) *IMO Resolution MSC.74(69), Annex 3*; or
 - (b) *IMO Resolution MSC.570(109)*, if installed on or after 1 January 2029.

THD

- (18) A THD on a ship must comply with—
- (a) *IMO Resolution MSC.166(78)*, if fitted after 1 July 2002; or
 - (b) *IMO Resolution MSC.116(73)*.

BNWAS

- (19) A BNWAS on a ship must comply with—
- (a) *IMO Resolution MSC.128(75)*; and
 - (b) *regulation 19 of Chapter V of SOLAS*, including annual testing.

Sextants

- (20) A sextant on a ship that proceeds into the unlimited area must be a marine sextant that complies with the *NBS Circular No.110*.

Section 4 Accessories supporting navigation systems and equipment

4.1 Application of requirements for navigation accessories

This Section specifies accessories that assist in the use of navigation systems and equipment for the purposes of rules 3K: B1.1(2), B1.1(5) and D4.2, D5.2, D5.3 and D5.4.

4.2 Accessories supporting navigation systems and equipment

Residual deviation information

- (1) A ship must carry an appropriate table or curve of residual deviations for each magnetic compass it is required to carry under this MTI.
- (2) The table or curve of residual deviations must be corrected, where necessary, by a recognised compass adjuster.

Section 5 Installation, servicing, repair, adjustment, and maintenance

5.1 Application of requirements for installation, servicing, repair, and maintenance

This Section specifies requirements for the installation, servicing, repair, adjustment, and maintenance of navigation systems and equipment for the purposes of rules 3K: B1.1(1) and (5) and D4.2, D5.2, D5.3, and D5.4.

5.2 Installation and adjustment of navigation systems and equipment

Fitting of magnetic compasses

A magnetic compass must not be fitted, repositioned, repaired, or adjusted unless—

- (a) the work is carried out in consultation with a recognised compass adjuster; and

- (b) the recognised compass adjuster provides any conditions or recommendations in writing to the operator; and
- (c) the operator complies with those conditions or recommendations.

5.3 Servicing of navigation equipment

Compass deviation requirements

- (1) A magnetic compass on a ship must have its deviation measured as soon as is reasonably practicable following—
 - (a) the addition, removal, or alteration of magnetic or electrical systems and equipment in the vicinity of the compass; or
 - (b) structural repairs or alterations to the ship that may affect the permanent or induced magnetism of the compass; or
 - (c) any other circumstance in which the compass is subject to significant disturbance, including but not limited to lightning strike, grounding, or prolonged idleness.
- (2) A legible and accessible record of the compass deviation must be made immediately after the deviation is measured.

Compass adjustment

- (3) A magnetic compass required to be fitted to a ship under Part 3K must be adjusted by a recognised compass adjuster—
 - (a) before the ship undertakes its first voyage with that compass; and
 - (b) following a major alteration that may affect a magnetic deviation, including but not limited to—
 - (i) individual or cumulative changes; or
 - (ii) the addition or removal of any electrical or metallic elements; and
 - (c) when deviation exceeds 5 degrees on any heading.
- (4) Subclause (3) does not apply to a Navigation Category 1 ship.
- (5) Following any adjustment described in subclause (3), the recognised compass adjuster must provide the operator with a written record that—
 - (a) confirms that the compass has been adjusted; and
 - (b) states the date of adjustment, the name and contact details of the compass adjuster, and any relevant observations and recommendations; and
 - (c) is signed and dated by the recognised compass adjuster.

Retention of records

- (6) The records required under subclauses (2) and (5) and clause 5.2(b) must be retained on board the ship and must be readily available for inspection by—
 - (a) a surveyor undertaking a survey; and
 - (b) the Director.

5.4 Repair and maintenance of navigation systems and equipment

A ship on a voyage must carry—

- (a) spare parts necessary for the repair or maintenance of the navigation systems and equipment likely to be required during the intended voyage; and

- (b) the special tools and other items necessary for the repair and maintenance of the navigation equipment; and
- (c) information and instructions, in printed form and in English language, relating to the use and maintenance of all navigation equipment.

Section 6 Recognition of compass adjusters

6.1 Process for recognition of compass adjusters

- (1) This Section specifies the experience and qualification, and certification requirements necessary for recognition as a compass adjuster for the purposes of rule 3K: D6.1.

Experience requirements

- (2) A person meets the experience requirements to be a recognised compass adjuster if, within the 5 years immediately preceding an application made under section 35 of the Act, the person has—
- (a) adjusted the compasses of at least 6 commercial ships in total; and
 - (b) of those ships, adjusted the compasses of at least 3 commercial ships on which the person was not the master.

Note: The 6 ships in paragraph (a) can include the ships in paragraph (b).

- (3) In addition to the qualification and certification requirements described in subclause (5)(iii) to (ix), the person must, when making an application for the first time, establish that they have assisted in 4 compass adjustments, including at least 1 adjustment on each Navigation Category 2, 3 and 4 ship prescribed in Part 3K.
- (4) Every compass adjustment undertaken for the purposes of subclause (3) must be overseen and certified by a recognised compass adjuster.

Qualification and certification requirements.

- (5) A person meets the qualification and certification requirements to be a recognised compass adjuster if they have received a valid certificate, recognised as a maritime document under section 41 of the Act, confirming successful completion of a compass adjuster qualification and—
- (a) served as a Sub-specialist Navigation Officer in the Royal New Zealand Navy; or
 - (b) hold 1 of the following qualifications under Part 32: Seafarer Certification:
 - (i) a certificate of competency as Chief mate:
 - (ii) a certificate of competency as Master:
 - (iii) a certificate of competency as Skipper coastal/offshore:
 - (iv) a certificate of competency as Master on ships of less than 500 gross tonnage:
 - (v) a certificate of competency as Chief mate on ships of less than 3000 gross tonnage:
 - (vi) a certificate of competency as Chief mate yacht:
 - (vii) a certificate of competency as Master yacht of less than 500 gross tonnage:
 - (viii) a certificate of competency as a Skipper fishing vessel – unlimited:
 - (ix) a valid certificate, recognised as a maritime document under section 41 of the Act, confirming successful completion of a qualification acceptable to the Director, provided that the requirements for that certificate and qualification are no less than those for the equivalent certificate and qualification listed in subparagraphs (i) to (viii).

Appendix: Codes of practice and official standards

A reference to a standard or convention in this MTI is a reference to that standard or convention as amended or replaced from time to time, unless otherwise specified.

SOLAS means Safety of Life at Sea Convention in the following:

Regulation 19 of Chapter V of SOLAS

IMO means International Maritime Organization in the following:

Magnetic & gyro-compasses / heading devices

IMO Resolution A.382(X) – Magnetic Compasses: Carriage and Performance Standards

IMO Resolution A.424(XI) – Performance Standards for Gyro Compasses

IMO Resolution MSC.116(73) – Performance Standards for Marine Transmitting Heading Devices (THDs)

IMO Resolution MSC.166(78) – Application of Performance Standards for THDs to Marine Transmitting Magnetic Heading Devices (TMHDs)

GPS

IMO Resolution A.819(19) – Performance Standards for Shipborne GPS Receiver Equipment

GLONASS

IMO Resolution MSC.113(73) – Revised Performance Standards for Shipborne GLONASS Receiver Equipment

Combined GPS/GLONASS

IMO Resolution MSC.115(73) – Revised Performance Standards for Shipborne Combined GPS/GLONASS Receiver Equipment

Galileo

IMO Resolution MSC.233(82) – Performance Standards for Shipborne Galileo Receiver Equipment

BeiDou (BDS)

IMO Resolution MSC.379(93) – Performance Standards for Shipborne BeiDou (BDS) Receiver Equipment

Multi-system GNSS

IMO Resolution MSC.401(95) – Performance Standards for Multi-System Shipborne Radionavigation Receivers

Other radionavigation receivers

IMO Resolution MSC.112(73) – Revised Performance Standards for Shipborne Loran-C and Chayka Receiver Equipment

IMO Resolution A.694(17) – General Requirements for Shipborne Radio Equipment Forming Part of GMDSS and for Electronic Navigational Aids

IMO Resolution MSC.114(73) – Revised Performance Standards for Shipborne DGPS & GLONASS Maritime Radio Beacon Receiver Equipment

Radar, ARPA, VDR, and BNWAS

IMO Resolution A.823(19) – Performance Standards for Automatic Radar Plotting Aids (ARPAs)

IMO Resolution MSC.192(79) – Revised Performance Standards for Radar Equipment

IMO Resolution MSC.128(75) – Bridge Navigational Watch Alarm Systems

Echo-sounding devices

IMO Resolution A.224(VII) – Performance Standards for Echo-Sounding Equipment

General / multi-equipment performance standards

IMO Resolution MSC.64(67) – Adoption of New and Amended Performance Standards

IMO Resolution MSC.74(69) – Adoption of New and Amended Performance Standards

AIS

IMO Resolution MSC.570(109), Performance standards for a universal shipborne Automatic Identification System (AIS) [only applies to new installations from 1 January 2029]

ISO means International Standards Organization in the following:

ISO 14227:2001: Small craft – Magnetic compasses

ISO 25862:2019: Ships and marine technology – Marine magnetic compasses, binnacles and azimuth reading devices

NBS means the United States National Bureau of Standards in the following:

NBS Circular No.110 (1921): Specifications for Marine Sextants. Washington, D.C.: Government Printing Office, 1921.