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Entwurf**Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt –****Darstellung von navigationsbezogenen Informationen auf Navigationsanzeigen für Schiffe –****Allgemeine Anforderungen, Prüfverfahren und geforderte Prüfergebnisse (IEC 80/661/CD:2012), Text in Englisch**

Maritime navigation and radiocommunication equipment and systems –
Presentation of navigation-related information on shipborne navigational displays –
General requirements, methods of testing and required test results (IEC 80/661/CD:2012),
Text in English

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2013-02-18 wird der Öffentlichkeit zur Prüfung und Stellungnahme vorgelegt.

Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses Entwurfes besonders zu vereinbaren.

Stellungnahmen werden erbeten

- vorzugsweise online im Norm-Entwurfs-Portal des DIN unter www.entwuerfe.din.de bzw. für Norm-Entwürfe der DKE auch im Norm-Entwurfs-Portal der DKE unter www.entwuerfe.normenbibliothek.de, sofern dort wiedergegeben;
- oder als Datei per E-Mail an dke@din.de möglichst in Form einer Tabelle. Die Vorlage dieser Tabelle kann im Internet unter www.din.de/stellungnahme oder für Stellungnahmen zu Norm-Entwürfen der DKE unter www.dke.de/stellungnahme abgerufen werden;
- oder in Papierform an die DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE (Hausanschrift: Stresemannallee 15, 60596 Frankfurt am Main).

Die Empfänger dieses Norm-Entwurfs werden gebeten, mit ihren Kommentaren jegliche relevanten Patentrechte, die sie kennen, mitzuteilen und unterstützende Dokumentationen zur Verfügung zu stellen.

Gesamtumfang 131 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE
Normenstelle Schiffs- und Meerestechnik (NSMT) im DIN

Nationales Vorwort

Die englische Originalfassung des internationalen Dokuments IEC 80/661/CD:2012 „Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results“ (CD, en: Committee Draft) ist unverändert in diesen Norm-Entwurf übernommen worden.

Das internationale Dokument wurde vom TC 80 „Maritime navigation and radiocommunication equipment and systems“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet und den nationalen Komitees zur Stellungnahme vorgelegt.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründen, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Das K 738 hat mit RS_738_2011-0028 beschlossen, dass die Bedingungen des DIN-Präsidialbeschlusses 1/2004 für das vorliegende Normprojekt erfüllt sind.

Da sich die Benutzer der vorliegenden Norm der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der IEC 62288 veröffentlicht. Zu deren Abschnitt 3, der die Abkürzungen und Begriffe festlegt, wurde eine Übersetzung angefertigt und als informativer Nationaler Anhang NA der vorliegenden Norm hinzugefügt. Für viele der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Diese Norm steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Die IEC und das Europäische Komitee für Elektrotechnische Normung (CENELEC) haben vereinbart, dass ein auf IEC-Ebene erarbeiteter Entwurf für eine Internationale Norm zeitgleich (parallel) bei IEC und CENELEC zur Umfrage (CDV-Stadium) und Abstimmung als FDIS (en: Final Draft International Standard) bzw. Schluss-Entwurf für eine Europäische Norm gestellt wird, um eine Beschleunigung und Straffung der Normungsarbeit zu erreichen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

Da der Abstimmungszeitraum für einen FDIS bzw. Schluss-Entwurf prEN nur 2 Monate beträgt, und dann keine sachlichen Stellungnahmen mehr abgegeben werden können, sondern nur noch eine „JA/NEIN“-Entscheidung möglich ist, wobei eine „NEIN“-Entscheidung fundiert begründet werden muss, wird bereits der CD als DIN-Norm-Entwurf veröffentlicht, um die Stellungnahmen aus der Öffentlichkeit frühzeitig berücksichtigen zu können.

Für dieses Dokument ist das nationale Arbeitsgremium K 738 „Elektronische Navigationsinstrumente“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE (www.dke.de) zuständig.

Es ist vorgesehen, auch bei der entsprechenden zukünftigen Deutschen Norm auf die deutsche Sprachfassung zu verzichten und diese in der englischsprachigen Fassung zu veröffentlichen

Für den Fall einer undatierten Verweisung im normativen Text (Verweisung auf eine Norm ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnietsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils neueste gültige Ausgabe der in Bezug genommenen Norm.

Für den Fall einer datierten Verweisung im normativen Text bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe der Norm.

Der Zusammenhang der zitierten Normen mit den entsprechenden Deutschen Normen ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

Änderungen

Gegenüber DIN EN 62288:2009-02 wurden folgende Änderungen vorgenommen:

- a) Anpassung an IMO-Resolutionen die nach MSC.191(79) veröffentlicht wurden: IMO MSC.252(83), IMO MSC.302(87) und IMO A.1021(26). Das Ergebnis ist die Einführung eines Alert Konzepts und geeigneter neuer Anforderungen in 4.8
- b) Die Einführung von Alert bezogenen Bildzeichen (Anhang F)
- c) Die Definition für AIS-Informationen wurde in Kapitel 3 hinzugefügt
- d) Die Definition für Bildhelligkeit wurde in Kapitel 3 hinzugefügt
- e) Die Definition für Zweifelhafte Integrität wurde in Kapitel 3 hinzugefügt
- f) Der Begriff Wichtiger Hinweis wurde in Kapitel 3 neu definiert
- g) Die Definition für Hinweis wurde in Kapitel 3 hinzugefügt
- h) Der Begriff Integrität wurde in Kapitel 3 neu definiert
- i) Alle Referenzen zu IBS und zum zurückgezogenen IMO MSC 64(67) Annex 1:1996, Leistungsanforderungen für Integrierte Brückensysteme (IBS), wurden entfernt
- j) Prüfverfahren wurden durchgesehen und ziemlich viele wurden von der Bewertung durch Beobachtung zur analytischen Bewertung geändert
- k) Die Konsistenz des Layouts in 4.2.1 wurde neu definiert
- l) Einführung von Anforderungen und Prüfverfahren für transflexive und reflexive Anzeigen in 4.3.1
- m) Der 75% Grenzwert für nichtzentrierte Anzeigen bei Nicht-Radargeräten oder -betriebsarten wurde in 6.1.8.1 entfernt
- n) Die minimale Größe für die maßstabsgetreue Umrissdarstellung vom eigenen Schiff und AIS Zielen wurde neu definiert (Anhang A)
- o) AIS-AtoN-Symbole, AIS-SART-Symbol und Symbol für die Startposition der Kursänderungsmanövers wurden neu definiert (Anhang A)
- p) Ein neues Symbol für SAR-Flugzeug wurde ergänzt (Anhang A)
- q) Neue Symbole für weitere Symbole wie NAVTEX und AIS anwendungsspezifische Meldungen wurden ergänzt (Anhang A)
- r) Für die verlustlose digitale Übertragung im Anhang D.6 wurde die Nutzung der Farbtoleranz ΔC^* neu definiert
- s) Die instrumentelle Verifikation der Farbtabelle, 'Dämmerung' und 'Nacht' wurde im Anhang D.6 ergänzt
- t) Einzelheiten zur Flimmerprüfung sind jetzt im Anhang D.7
- u) Bildzeichen für die Steuerung bzgl. der Spannungsversorgung wurden in Tabelle E.3 neu definiert
- v) Ein neuer informativer Anhang G wurde als Anleitung zur Auswahl geeigneter Prüfverfahren für darstellungsbezogene Anforderungen nach IEC 60945 ergänzt

Nationaler Anhang NA (informativ)

NA.1 Begriffe

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

Die deutschen Übersetzungen haben Empfehlungscharakter und können nur die ungefähre Begrifflichkeit in Deutsch wiedergeben. Unter Experten wird empfohlen, ausschließlich die englischen Fachbegriffe zu verwenden, um die Gefahr von Missverständnissen zu reduzieren.

NA.1.1 Begriffe

1.1.1

aktiviertes AIS-Ziel

[en: activated AIS target]

(MSC191/A) Ziel, das für die Anzeige zusätzlicher, grafisch dargestellter Informationen (z. B.: Kurslinie, Geschwindigkeitsvektor, usw.) aktiviert ist

[en: (MSC191/A) target activated for the display of additional graphically presented information (for example, heading line, velocity vector, etc.)]

1.1.2

automatisches Identifizierungssystem

AIS

[en: automatic identification system

AIS]

System, das den Anforderungen in Anhang 3 der IMO Resolution MSC.74(69) entspricht

[en: system which complies with the requirements set forth in Annex 3 to IMO Resolution MSC.74(69)]

1.1.3

AIS-Informationen

[en: AIS information]

Nach der ITU-R Empfehlung M.1371 stehen die folgenden AIS-Meldungsbezeichnungen für unterschiedlichen Fälle von AIS-Informationen:

- Klasse A Ziel: Meldung1, Meldung2, Meldung3 und Meldung5
- Klasse B Ziel: Meldung18, Meldung19 und Meldung24
- Hilfsmittel zur Navigation (AtoN): Meldung21
- Sicherheit: Meldung12 und Meldung14
- Basisstation: Meldung4
- Such- und Rettungsflugzeug: Meldung9
- AIS SART: Meldung1 und Meldung14.

[en: based on ITU-R M1371 the following AIS message IDs representing different AIS information cases

- Class A target: Message1, Message2, Message3 and Message5
- Class B target: Message18, Message19 and Message24
- AtoN: Message21
- Safety: Message12 and Message14
- Base station: Message4
- SAR Aircraft: Message9
- AIS SART: Message1 and Message14]

1.1.4

AIS-Ziel (oder gemeldetes AIS-Ziel)

[en: AIS target (or reported AIS target)]

(MSC191/A) aus einer AIS-Meldung abgeleitetes Ziel

[en: (MSC191/A) target generated from an AIS message]

1.1.5

Alarmmeldung

[en: alarm]

(MSC302/A) Alert hoher Priorität. Ein Zustand der unmittelbare Aufmerksamkeit und Maßnahmen der Brückenmannschaft erfordert, um die sichere Schiffsführung zu gewährleisten.

[en: (MSC.302/A) a high-priority alert. Condition requiring immediate attention and action by the bridge team, to maintain the safe navigation of the ship]

1.1.6

Alert

[en: alert]

(MSC302/A) Ankündigung von außergewöhnlichen Situationen und Zuständen, die Aufmerksamkeit erfordern. Alerts werden in vier Prioritäten eingeteilt: Notfallalarmmeldungen, Alarmmeldungen, Warnmeldungen, Vorsichtsmeldungen. Ein Alert stellt Informationen über eine definierte Zustandsänderung zusammen mit Informationen darüber bereit, wie dieses Ereignis in bestimmter Art und Weise dem System und dem Anwender anzukündigen ist.

[en: (MSC.302/A) announcement of abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions. An alert provides information about a defined state change in connection with information about how to announce this event in a defined way to the system and the operator]

1.1.7

assoziiertes Ziel

[en: associated target]

(MSC191/A) Ziel, das gleichzeitig ein verfolgtes Radarziel und ein gemeldetes AIS-Ziel mit ähnlichen Parametern (z. B.: Position, Kurs, Geschwindigkeit usw.) darstellt und einem Zuordnungsalgorithmus entspricht

[en: (MSC191/A) target simultaneously representing a tracked radar target and a reported AIS target having similar parameters (for example, position, course, speed, etc.) and which comply with an association algorithm]

1.1.8

Bildhelligkeit

BRILL

[en: brilliance

BRILL]

Einstellung der Helligkeit einer Anzeige entsprechend der Umgebungsbeleuchtung (z. B.: Steuerung der LCD-Hintergrundbeleuchtung)

[en: adjustment of luminance of a display for ambient light condition (for example control of backlight for LCD)]

1.1.9

Vorsichtsmeldung

[en: caution]

(MSC302/A) Alert niedrigster Priorität. Wahrnehmung eines Zustands, der keine Alarmmeldung oder Warnmeldung rechtfertigt aber bei der normalen Bewertung der Situation oder der gegebenen Informationen trotzdem Aufmerksamkeit erfordert.

[en: (MSC.302/A) lowest priority of an alert. Awareness of a condition which does not warrant an alarm or warning condition, but still requires attention out of the ordinary consideration of the situation or of given information]

1.1.10

einheitlicher gemeinsamer Bezugspunkt

CCRP

[en: consistent common reference point

CCRP]

(MSC191/A) Ort auf dem eigenen Schiff auf den alle horizontalen Messungen wie Eigenschiffsposition, anliegender Kurs, Schiffslage, Zielentfernung und -peilung, relativer Kurs, relative Geschwindigkeit, kleinster Passierabstand (CPA), Zeit bis zum kleinsten Passierabstand (TCPA) bezogen sind, in der Regel der Steuerstand auf der Brücke. Ein (oder mehrere) alternative(r) Punkt(e) können genutzt werden, wenn dies klar angezeigt wird oder unverwechselbar naheliegend ist, z. B.: der Ursprung der Bezugsachse des Schiffs.

[en: (MSC191/A) location on own ship, to which all horizontal measurements such as own ship position, heading, attitude, and target range, bearing, relative course, relative speed, closest point of approach (CPA) or time to closest point of approach (TCPA) are referenced, typically the conning position of the ship. An

alternative location (or multiple locations) may be used as necessary where clearly indicated or distinctively obvious, for example, the origin of the reference axis of the ship]

1.1.11

zusammengesetzte Darstellung

[en: composite presentation]

integrierte Darstellung die von der gleichzeitigen Anzeige von Informationen von zwei oder mehr Navigationssystemen oder -Geräten abgeleitet wird

[en: integrated presentation that is derived from the simultaneous display of information from two or more navigational systems or equipment]

1.1.12

gefährliches Ziel

[en: dangerous target]

(MSC191/A) verfolgtes Radarziel oder gemeldetes AIS-Ziel mit einem vorausgesagten kleinsten Passierabstand (CPA) und Zeit bis zum kleinsten Passierabstand (TCPA) der die durch den Anwender voreingestellten Werte verletzt. Das entsprechende Ziel ist mit einem „Dangerous Target“ Symbol gekennzeichnet.

[en: (MSC191/A) tracked radar or reported AIS target with a predicted CPA and TCPA that violates values preset by the user. The respective target is marked by a “dangerous target” symbol]

1.1.13

gekoppelte Position

DR

[en: dead-reckoned position

DR]

von der letzten akzeptierten Positionsaktualisierung hochgerechnete Position, die auf gegenwärtigem Kurs und Geschwindigkeit basiert und in einem durch den Anwender gewählten Zeitintervall aktualisiert wird

[en: position extrapolated from the last accepted position update, based on present course and speed, and updated on a time interval selected by the operator]

1.1.14

Basisanzeige

[en: display base]

(MSC191/A) Level an Informationen, die von der ECDIS Anzeige nicht entfernt werden können und aus Informationen bestehen, die zu jeder Zeit, in allen geographischen Regionen und unter allen Umständen erforderlich sind. Dabei wird kein Anspruch darauf erhoben, für eine sichere Navigation ausreichend zu sein.

[en: (MSC191/A) level of information which cannot be removed from the ECDIS display, consisting of information which is required at all times in all geographic areas and all circumstances. It is not intended to be sufficient for safe navigation]

1.1.15

Anzeigegerät

[en: display equipment]

Gerät das Informationen visuell darstellt

[en: device capable of representing information visually]

1.1.16

zweifelhafte Integrität

[en: doubtful integrity]

Zustand in dem die Integrität nicht verifiziert werden kann

[en: a state when integrity cannot be verified]

1.1.17

elektronisches Seekartendarstellungs- und Informationssystem

ECDIS

[en: electronic chart display and information system

ECDIS]

System welches den in der IMO-Resolution MSC.232(82) niedergelegten Anforderungen entspricht

[en: system which complies with the requirements set forth in IMO Resolution MSC.232(82)]

1.1.18

elektronische Karteninformationen

[en: electronic chart information]

Eine oder mehrere elektronische Kartendatenbasen (zum Beispiel, ENC)

[en: one or more electronic chart databases (for example, ENC)]

1.1.19

elektronische Seekarte

ENC

[en: electronic navigational chart

ENC]

(MSC191/A) hinsichtlich Inhalt, Struktur und Format entsprechend IHO S-57 und dessen Anhang B.1 standardisierte Datenbasis, die durch oder im Auftrag einer Regierung veröffentlicht wurde

[en: (MSC191/A) *database standardised as to content, structure and format according to IHO S-57 and its Appendix B.1 and issued by, or on the authority of, a Government*]

1.1.20

Notfallalarmmeldung

[en: emergency alarm]

(MSC.302/A) Alert höchster Priorität. Alerts die unmittelbare Gefahr für menschliches Leben oder das Schiff und dessen Ausrüstung anzeigen und unmittelbares Handeln erfordern.

[en: *highest priority of an alert. Alarms which indicate immediate danger to human life or to the ship and its machinery exists and require immediate action*]

1.1.21

geschätzte Position

EP

[en: estimate position

EP]

durch den gemeinsamen Kreuzungspunkt von zwei Positionslinien (LOPs) bestimmte Position des eigenen Schiffs

[en: position of own ship determined by the common intersection of two LOPs]

1.1.22

Fix

[en: fix]

durch den gemeinsamen Kreuzungspunkt von drei oder mehr LOPs bestimmte Position des eigenen Schiffs, ohne Bezug zu einer früheren Position

[en: position of own ship determined, without reference to any former position, by the common intersection of three or more LOPs]

1.1.23

anliegender Kurs

[en: heading]

(MSC191/A) als Winkel gegenüber Norden ausgedrückte horizontale Richtung, in die der Bug eines Schiffs in jedem Moment tatsächlich zeigt

[en: (MSC191/A) *horizontal direction in which the bow of a ship is actually pointing at any instant, expressed as an angular displacement from north*]

1.1.24**Mensch-Maschine-Schnittstelle**

[en: human machine interface]

Interaktionsschnittstelle zwischen Anwendern und Maschinen, die alle Mittel zur Erreichung eines bestimmten Ziels bietet oder die Aufgabenschnittstelle zwischen Menschen und Maschinen entsprechend der Zuordnung von Funktionen zu Menschen und/oder Maschinen

[en: interaction interface between humans and machines consisting of all elements used to achieve a particular goal, or the task interface between humans and machines resulting from the allocation of functions to humans and/or machines]

1.1.25

)

1.1.26**Bildzeichen**

[en: icon]

grafisches Symbol mit einer bestimmten Bedeutung, um sprachunabhängige Informationen zu liefern. Bildzeichen dürfen zur visuellen Identifikation oder Verstärkung einer textlichen Beschreibung verwendet werden, um eine Funktion aufzurufen oder um ein Objekt zu öffnen bei Auswahl mit dem Cursor.

[en: graphical symbol with a particular meaning used to convey information independent of language. Icons may be used for visual identification or reinforcement of a textual description, to invoke a function, or to open an object when selected with the cursor]

1.1.27**wichtiger Hinweis**

[en: important indication]

Kennzeichnung eines betrieblichen Zustands angezeigter Informationen der spezieller Aufmerksamkeit bedarf, zum Beispiel Informationen mit niedriger Integrität oder ungültige Informationen. Der wichtige Hinweis ist nicht Teil der Alert-Klassifikation.

[en: (MSC191/A) *marking of an operational status of displayed information which needs special attention, for example, information with low integrity or invalid information. The important indication is not part of alert classification*]

1.1.28**Hinweis**

[en: indication]

Kennzeichnung eines betrieblichen Zustands angezeigter Informationen der Aufmerksamkeit bedarf, aber kein zugeordnetes hörbares Signal benötigt. Der Hinweis ist nicht Teil der Alert-Klassifikation.

[en: marking of an operational status of displayed information which needs attention but does not require any associated audible signal. The indication is not part of the alert classification]

1.1.29**integriertes Navigationssystem**

INS

[en: integrated navigation system]

INS]

System welches den in der IMO-Resolution MSC.252(83) niedergelegten Anforderungen entspricht

[en: system which complies with the requirements set forth in IMO Resolution MSC.252(83)]

1.1.30**Integrität**

[en: integrity]

(MSC 252/Appendix 1) Eigenschaft von Informationen, die spezifizierte Genauigkeit rechtzeitig, vollständig und unverwechselbar einzuhalten

[en: (MSC 252/Appendix 1) property of information as being *within the specified accuracy in a timely, complete and unambiguous manner*]

1.1.31

Positionslinie

LOP

[en: line of position

LOP]

durch Beobachtung oder Messung der Entfernung oder der Peilung zu einer Navigationshilfe oder einem anderen kartierten Element gezeichnete Linie, auf der sich das eigene Schiff befindet

[en: plotted line on which own ship is located determined by observation or measurement of the range or bearing to an aid to navigation or other charted element]

1.1.32

verlorenes Ziel

[en: lost target]

(MSC191/A) verfolgtes Radarziel oder gemeldetes AIS-Ziel für das das System keine gültigen Positionsdaten mehr empfängt. Das Ziel ist durch ein „lost target“-Symbol dargestellt.

[en: (MSC191/A) tracked radar or reported AIS *target* for which the system is no longer receiving *valid position data*. *The target is represented by a “lost target” symbol*]

1.1.33

Menü

[en: menu]

Anzeigebereich mit einer strukturierten Liste von Optionen zur Auswahl und Eingabe von Betriebsparametern, Daten und Befehlen

[en: area of the display that is allocated to a structured list of options for the selection and entry of operational parameters, data and commands]

1.1.34

Multifunktionsanzeige

[en: multifunction display]

einzelne visuelle Anzeigeeinheit, die Informationen von mehreren Systemen oder Geräten entweder gleichzeitig oder durch eine Folge auswählbarer Seiten darstellen kann. Eine Multifunktionsanzeige darf typischerweise Teil eines INS sein (bietet zum Beispiel bestimmte Darstellungsarten entsprechend den Radar- und ECDIS-Anforderungen) und darf deren individuelle Anzeigeeinheiten ersetzen.

[en: single visual display unit that can present, either simultaneously or through a series of selectable pages, information from multiple systems or equipment. A multifunction display may typically be part of an INS (for example, providing dedicated presentation modes conforming to both radar and ECDIS presentation requirements), and may replace their individual display units]

1.1.35

betrieblicher Anzeigebereich

[en: operational display area]

(MSC191/A) Anzeigebereich zur grafischen Präsentation elektronischer Karten- und/oder Radarinformationen, ohne den Anwenderdialogbereich. Auf der Kartenanzeige ist das der Bereich der Kartendarstellung. Auf der Radaranzeige ist das der Bereich des Radarbildes.

[en: *area of the display used to graphically present electronic chart and/or radar information, excluding the user dialogue area. On the chart display this is the area of the chart presentation. On the radar display this is the area encompassing the radar video image*]

1.1.36

vorherige Positionen

[en: past positions]

(MSC191/A) in zeitlich regelmäßigen Abständen gesetzte Markierungen auf der bisherigen Spur des eigenen Schiffs oder eines verfolgten Radarziels oder eines gemeldeten AIS-Ziels

[en: (MSC191/A) *time-spaced marks* on the past track of own ship, or a tracked radar or reported AIS target]

1.1.37**permanent**

[en: permanent]

Eigenschaft von Informationen, für lange Zeit (oder für immer) unverändert zu existieren

[en: property of information as existing for a long time (or forever) without change]

1.1.38**ausdauernd**

[en: persistent]

Eigenschaft von Informationen, kontinuierlich zu existieren

[en: property of information as existing continuously]

1.1.39**Radar**

[en: radar]

System welches den in der IMO-Resolution MSC.192(79) niedergelegten Anforderungen entspricht

[en: system which complies with the requirements set forth in IMO Resolution MSC.192(79)]

1.1.40**Radarecho**

[en: radar echo]

Reflektiertes Radarsignal (d.h. „paint“) das im Radarbild erscheint

[en: returned radar signal (i.e. "paint") appearing in the radar video image]

1.1.41**Radarbild**

[en: radar video image]

Satz angezeigter Informationen, die aus Radarechos konstruiert werden, die mit Anti-Clutter-Mitteln und anderen Werkzeugen bearbeitet wurden (zum Beispiel, Scan-to-scan Korrelation)

[en: set of displayed information constructed from radar echoes processed by anti-clutter means and other tools (for example, scan-to-scan correlation)]

1.1.42**unmittelbar verfügbar**

[en: readily available]

Eigenschaft von Informationen direkt zugreifbar zu sein (zum Beispiel aus einem Top-Level-Menü, von einer Bildschirmfunktion oder einem Bildzeichen, usw.)

[en: property of information as being directly accessible (for example, in a top-level menu, from a screen function, or an icon, etc.)]

1.1.43**ausgewähltes Ziel**

[en: selected target]

(MSC191/A) manuell oder automatisch ausgewähltes Ziel zur Anzeige detaillierter alphanumerischer Daten, Informationen und Text in einen separaten Anwenderdialogbereich. Das Ziel wird durch ein „selected target“ Symbol dargestellt.

[en: (MSC191/A) *target selected manually or automatically for the display of detailed alphanumeric data, information and text in a separate user dialogue area. The target is represented by a "selected target" symbol*]

1.1.44**einzelner Bedienschnitt**

[en: single user/operator action]

Verwendung einer einzelnen Hardware-Taste oder die Anwendung eines Zeigers, um ein einzelnes Anzeige-Bildzeichen oder Fenster auszuwählen, gefolgt von der Betätigung einer Taste

[en: use of a single hardware key, or the use of a cursor, to select a single display icon or window followed by the operation of a key]

1.1.45

schlafendes AIS-Ziel

[en: sleeping AIS target]

(MSC191/A) AIS-Ziel, das das Vorhandensein eines mit AIS ausgerüsteten Schiffes an einem bestimmten Ort anzeigt. Das Ziel wird durch ein „sleeping target“ Symbol dargestellt, das die Orientierung des Schiffs anzeigt. Es werden keine weiteren Informationen angezeigt, bevor das AIS-Ziel aktiviert ist.

[en: (MSC191/A) AIS target indicating the presence of a vessel equipped with AIS in a certain location. The target is represented by a “sleeping target” symbol indicating the vessel’s orientation. No additional information is presented until the AIS target is activated]

1.1.46

Standard Anzeige

[en: standard display]

(MSC191/A) Level an Informationen, die angezeigt werden, wenn eine Karte zum ersten Mal auf dem ECDIS dargestellt wird. Der Level an Informationen, die für die Routenplanung oder Routenüberwachung bereitgestellt werden, darf durch den Anwender entsprechend dessen Anforderungen geändert werden.

[en: (MSC191/A) level of information that should be shown when a chart is first displayed on ECDIS. The level of the information it provides for route planning or route monitoring may be modified by the user according to the user’s needs]

1.1.47

Zielverfolgungssystem

[en: target tracking system]

System welches den in der IMO-Resolution MSC.192(79) niedergelegten Anforderungen entspricht

[en: system which complies with the requirements set forth in IMO Resolution MSC.192(79)]

1.1.48

anstehende Aufgabe

[en: task-at-hand]

Spezielle, navigationsbezogene Tätigkeit, die durch einen Anwender ausgeführt wird (zum Beispiel Routenplanung, Routenüberwachung, Zielverfolgung, Kollisionsvermeidung, usw.)

[en: specific navigation-related activity performed by a user (for example, route planning, route monitoring, target tracking, collision avoidance, etc.)]

1.1.49

verfolgtes Radarziel

[en: tracked radar target]

Positionsfestes oder sich bewegendes Objekt, das durch ein Radar oder Zielverfolgungssystem verfolgt wird

[en: object, fixed or moving, which is tracked by a radar or target tracking system]

1.1.50

Probemanöver

[en: trial manoeuvre]

(MSC191/A) Möglichkeit, die den Anwender dabei unterstützt, ein simuliertes Manöver zur Navigation und zu Kollisionsvermeidungszwecken durchzuführen, indem die vorausberechneten zukünftigen Zustände aller verfolgten Radarziele und die gemeldeten AIS-Ziele als Resultat des simulierten Manövers angezeigt werden

[en: (MSC191/A) facility used to assist the user to perform a simulated manoeuvre for navigation and collision avoidance purposes, by displaying the predicted future status of all tracked radar and reported AIS targets as a result of the simulated manoeuvres]

1.1.51**durch den Anwender ergänzte elektronische Karteninformationen**

[en: user-added electronic chart information]

manuell durch den Anwender zur Anzeige eingegebene elektronische Karteninformationen (zum Beispiel Navigationsnotizen, Sicherheitszonen von Interesse, lokale Nachrichten für Seefahrer, usw.)

[en: electronic chart information manually entered by the user for presentation (for example, navigational notes, safety zones of interest, local notices to mariners, etc.)]

1.1.52**vom Anwender konfigurierte Darstellung**

[en: user-configured presentation]

(MSC191/A) unterstützende Darstellung, die durch den Anwender für eine speziell anstehende Aufgabe konfiguriert wurde. Die Darstellung kann Radar- und/oder elektronische Karteninformationen in Kombination mit anderer navigations- oder schiffsbezogenen Daten enthalten.

[en: (MSC191/A) *auxiliary presentation configured by the user for a specific task-at-hand. The presentation may include radar and/or electronic chart information, in combination with other navigational or ship related data*]

1.1.53**Anwenderdialogbereich**

[en: user dialogue area]

(MSC191/A) Anzeigebereich, der aus Datenfeldern und oder Menüs besteht, der der interaktiven Darstellung und Eingabe oder Auswahl betrieblicher Parameter, Daten, Informationen, Text und Befehlen hauptsächlich in alphanumerischer Form zugeordnet ist

[en: (MSC191/A) *area of the display consisting of data fields and/or menus that is allocated to the interactive presentation and entry or selection of operational parameters, data, information, text and commands mainly in alphanumeric form*]

1.1.54**Gültigkeit**

[en: validity]

Eigenschaft von Informationen, die Übereinstimmung mit spezifizierten Kriterien einzuhalten und die Kennzeichnung solcher Informationen als „gültig“ oder „ungültig“ (d. h. „gut“ oder „nicht gut“) für die beabsichtigte Anwendung

[en: property of information as conforming to specified criteria, and the marking of such information as being “valid” or “invalid” (i.e. “good” or “no good”) for its intended use]

1.1.55**Warnmeldung**

[en: warning]

(MSC.302/A) Alert für einen Zustand, der sofortige Aufmerksamkeit aber keine unmittelbare Aktivität der Brückenbesatzung erfordert. Warnmeldungen werden vorsorglich angezeigt, um die Brückenbesatzung auf geänderte Situationen hinzuweisen, die noch nicht unmittelbar gefährlich sind, dies aber werden können, wenn nichts unternommen wird (siehe auch „Wichtiger Hinweis“).

[en: (MSC.302/A) *alert for condition requiring immediate attention, but no immediate action by the bridge team. Warnings are presented for precautionary reasons to make the bridge team aware of changed conditions which are not immediately hazardous, but may become so if no action is taken, (see also important indication)*]

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS –****Presentation of navigation-related information
on shipborne navigational displays –
General requirements, methods of testing and required test results**

FOREWORD

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International Standard IEC 62288 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This standard supports the performance standards for the presentation of navigation-related information on shipborne navigational displays, adopted by the IMO in resolution MSC.191(79) in December 2004.

This second edition cancels and replaces IEC 62288 published in 2008 and constitutes a technical revision. The major changes are

- Adaptation to IMO resolutions published since MSC.191(79): IMO MSC.252(83), IMO MSC.302(87) and IMO A.1021(26). Result is introduction of alert concept and appropriate new requirements in 4.8.
- Introduction of alert related icons (Annex F)

- Definition of AIS information has been added in Clause 3
- Definition of Brilliance has been added in Clause 3
- Definition of Doubtful integrity has been redefined in Clause 3
- Definition of Important indication has been redefined in Clause 3
- Definition of Indication has been added in Clause 3
- Definition of Integrity has been redefined in Clause 3
- All references to IBS and to cancelled IMO MSC.64(67) Annex 1:1996, Performance standards for integrated bridge systems (IBS), has been removed
- Test methods have been reviewed and quite many have been changed from the observation to the analytical evaluation
- Consistency of the layout has been redefined in 4.2.1
- Introduction of requirements and test methods for transfective and reflective display in 4.3.1
- The off-centring limit of 75% has been removed from non Radar equipment or mode in 6.1.8.1
- Minimum size of the own ship and AIS true scale outline symbol is redefined (Annex A)
- AIS AtoN symbols, AIS SART symbol and wheel over position symbol are redefined (annex A)
- New symbol has been added for AIS SAR aircraft (Annex A)
- New symbols has been added for Other symbols such as NAVTEX and AIS application specific messages (Annex A)
- Use of colour tolerance ΔC^* is redefined for digital lossless transfer in Annex D.6
- Instrumental verification of colour tables Dusk and Night has been added in Annex D.6
- Details how to test flicker are now in Annex D.7
- Power related control icons are redefined in Table E.3
- New informative Annex G has been added as guidance for selection appropriate check methods for presentation related requirements set in IEC 60945

The text of this standard is based on the following documents:

FDIS	Report on voting
80/527/FDIS	80/540/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results

1 Scope

This International Standard specifies the general requirements, methods of testing, and required test results, for the presentation of navigation-related information on shipborne navigational displays in support of IMO resolution MSC.191(79).

(MSC191/1) IMO resolution MSC.191(79) *harmonizes the requirements for the presentation of navigation-related information on the bridge of a ship to ensure that all navigational displays adopt a consistent human machine interface philosophy and implementation.*

(MSC191/1) IMO resolution MSC.191(79) *supplements and, in the case of a conflict, takes priority over, the presentation requirements of the individual performance standards adopted by the IMO for relevant navigational systems and equipment and covers the presentation of navigation-related information by equipment for which Performance Standards have not been adopted by the IMO.*

This standard also addresses the guidelines for the presentation of navigation-related symbols, terms and abbreviations in Safety of Navigation circular SN/Circ.243 together with some requirements published in resolution MSC.192(79) on radar; resolution MSC.232(82) on ECDIS; and ergonomic criteria published in circular MSC/Circ.982.

The symbols from SN/Circ.243 are reproduced and expanded upon in Annex A. The terms and abbreviations from SN/Circ.243 are reproduced and expanded upon in Annex B. Additional guidance on display and dialogue design from MSC/Circ.982 is listed by reference in Annex C.

Some requirements set forth in MSC.191(79) duplicate requirements set forth in other IMO documents (for example, Resolutions A.694(17), MSC.192(79), MSC.232(82), etc.) or in the IEC standards further specifying the methods of test and required test results for those requirements (for example, IEC 60945, IEC 61174, IEC 62388, etc.). Where a requirement in this standard duplicates a requirement in another standard, the method(s) of test for that requirement may refer to the other standard.

NOTE Manufactures may offer relevant test data from compliance tests to other standards such as IEC 60945, IEC 61174, IEC 62388, etc. as evidence of compliance with appropriate tests of this standard.

This standard is organized so that each group of requirements is immediately followed by a clause identifying the method(s) of test. The methods of test are derived from ISO 9241-12 on the presentation of information on visual displays. Guidance on testing is provided in Annex D.

Additional guidance on testing of presentation of information on visual displays required by IEC 60945 is provided in Annex G. This annex is provided to promote harmonization between IEC 62288 and IEC 60945.

NOTE All text in this standard whose wording is identical to text contained in an IMO document is printed in *italics*. Reference to the document is noted at the beginning of the paragraph. The notation contains a prefix

referring to the document and a suffix with the paragraph number from the document (for example, (MSC191/1); (SN243/1), etc.).

1.1 Purpose

(MSC191/2) This standard *specifies the presentation of navigational information on the bridge of a ship, including the consistent use of navigational terms, abbreviations, colours and symbols, as well as other presentation characteristics.*

(MSC191/2) This standard *also addresses the presentation of information related to specific navigational tasks by recognising user selected presentations in addition to presentations required by the relevant individual performance standards adopted by the IMO.*

1.2 Application

(MSC191/3) This standard *is applicable to any display equipment associated with the navigational systems and equipment for which individual performance standards have been adopted by the IMO.* It addresses the stand-alone displays for radar and ECDIS, the multifunction displays and composite presentations that integrate information derived from two or more systems. This standard *also addresses display equipment associated with navigational systems and equipment for which individual performance standards have not been adopted by the IMO.*

NOTE Some IEC standards may individually include display requirements in conformity with IMO resolution MSC.191(79).

(MSC191/3) *The general principles and the physical characteristics specified in Clauses 4 and 7, respectively, of this standard are applicable to all displays on the bridge of a ship.*

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of tests of testing and required test results*

IEC 61162, (all parts) *Maritime navigation and radiocommunication equipment and systems - Digital interfaces*

IEC 61174, *Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results*

IEC 61966-4:2000, *Multimedia systems and equipment – Colour measurement and management – Part 4: Equipment using liquid crystal display panels*

IEC 62065, *Maritime navigation and radiocommunication equipment and systems – Track control systems – Operational and performance requirements, methods of testing and required test results*

IEC 62388, *Maritime navigation and radiocommunication equipment and systems – Shipborne radar – Performance requirements, methods of testing and required test results*

IHO S-52:1996, *Specifications for chart content and display aspects of ECDIS*

IHO S-52 Appendix 1:1996, *Guidance on updating the electronic navigational chart*

IHO S-52 Appendix 2:2004, *Colour and symbol specifications for ECDIS*

IMO A.694(17):1991, *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO MSC.191(79):2004, *Performance standards for the presentation of navigation related information on shipborne navigational displays*

IMO MSC.192(79):2004, *Performance standards for radar equipment*

IMO MSC.232(82):2006, *Revised performance standards for electronic chart display and information systems (ECDIS)*

IMO SN/Circ.243:2004, *Guidelines for the presentation of navigation related symbols, terms and abbreviations*

IMO MSC.252(83): 2007, *Performance standards for integrated navigation systems (INS)*

IMO MSC.302(87): 2010, *Performance standards for bridge alert management (BAM)*

IMO A.1021(26): 2009, *Code on Alerts and Indications*

VESA-2001-6:2001, *Flat Panel Display Measurements (FPDM)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

activated AIS target

(MSC191/A) *target activated for the display of additional graphically presented information (for example, heading line, velocity vector, etc.)*

3.2

automatic identification system

AIS

system which complies with the requirements set forth in Annex 3 to IMO Resolution MSC.74(69)

3.3

AIS information

based on ITU-R M1371 the following AIS message IDs representing different AIS information cases

- Class A target: Message1, Message2, Message3 and Message5
- Class B target: Message18, Message19 and Message24
- AtoN: Message21
- Safety: Message12 and Message14
- Base station: Message4
- SAR Aircraft: Message9

- AIS SART: Message1 and Message14

3.4

AIS target (or reported AIS target)

(MSC191/A) *target generated from an AIS message*

3.5

alarm

(MSC.302/A) *a high-priority alert. Condition requiring immediate attention and action by the bridge team, to maintain the safe navigation of the ship.*

3.6

alert

(MSC.302/A) *announcement of abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions. An alert provides information about a defined state change in connection with information about how to announce this event in a defined way to the system and the operator.*

3.7

associated target

(MSC191/A) *target simultaneously representing a tracked radar target and a reported AIS target having similar parameters (for example, position, course, speed, etc.) and which comply with an association algorithm*

3.8

brilliance

BRILL

adjustment of luminance of a display for ambient light condition (for example control of backlight for LCD)

3.9

caution

(MSC.302/A) *lowest priority of an alert. Awareness of a condition which does not warrant an alarm or warning condition, but still requires attention out of the ordinary consideration of the situation or of given information.*

3.10

consistent common reference point

CCRP

(MSC191/A) *location on own ship, to which all horizontal measurements such as own ship position, heading, attitude, and target range, bearing, relative course, relative speed, closest point of approach (CPA) or time to closest point of approach (TCPA) are referenced, typically the conning position of the ship. An alternative location (or multiple locations) may be used as necessary where clearly indicated or distinctively obvious, for example, the origin of the reference axis of the ship*

3.11

composite presentation

integrated presentation that is derived from the simultaneous display of information from two or more navigational systems or equipment

3.12

dangerous target

(MSC191/A) *tracked radar or reported AIS target with a predicted CPA and TCPA that violates values preset by the user. The respective target is marked by a “dangerous target” symbol*

3.13

dead-reckoned position

DR

position extrapolated from the last accepted position update, based on present course and speed, and updated on a time interval selected by the operator

3.14

display base

(MSC191/A) *level of information which cannot be removed from the ECDIS display, consisting of information which is required at all times in all geographic areas and all circumstances. It is not intended to be sufficient for safe navigation*

3.15

display equipment

device capable of representing information visually

3.16

doubtful integrity

a state when integrity cannot be verified

3.17

electronic chart display and information system

ECDIS

system which complies with the requirements set forth in IMO Resolution MSC.232(82)

3.18

electronic chart information

one or more electronic chart databases (for example, ENC)

3.19

electronic navigational chart

ENC

(MSC191/A) *database standardised as to content, structure and format according to IHO S-57 and its Appendix B.1 and issued by, or on the authority of, a Government*

3.20

emergency alarm

(MSC.302/A) *highest priority of an alert. Alarms which indicate immediate danger to human life or to the ship and its machinery exists and require immediate action.*

3.21

estimated position

EP

position of own ship determined by the common intersection of two LOPs

3.22

fix

position of own ship determined, without reference to any former position, by the common intersection of three or more LOPs

3.23

heading

(MSC191/A) *horizontal direction in which the bow of a ship is actually pointing at any instant, expressed as an angular displacement from north*

3.24**human machine interface**

interaction interface between humans and machines consisting of all elements used to achieve a particular goal, or the task interface between humans and machines resulting from the allocation of functions to humans and/or machines

3.25

)

3.26**icon**

graphical symbol with a particular meaning used to convey information independent of language. Icons may be used for visual identification or reinforcement of a textual description, to invoke a function, or to open an object when selected with the cursor

3.27**important indication**

(MSC191/A) *marking of an operational status of displayed information which needs special attention, for example, information with low integrity or invalid information.* The important indication is not part of alert classification.

3.28**indication**

marking of an operational status of displayed information which needs attention but does not require any associated audible signal. The indication is not part of the alert classification.

3.29**integrated navigation system****INS**

system which complies with the requirements set forth in IMO Resolution MSC.252(83)

3.30**integrity**

(MSC 252/Appendix 1) property of information as being *within the specified accuracy in a timely, complete and unambiguous manner*

3.31**line of position****LOP**

plotted line on which own ship is located determined by observation or measurement of the range or bearing to an aid to navigation or other charted element

3.32**lost target**

(MSC191/A) tracked radar or reported AIS *target* for which the system is no longer receiving *valid position data.* The *target* is represented by a “lost target” symbol

3.33**menu**

area of the display that is allocated to a structured list of options for the selection and entry of operational parameters, data and commands

3.34**multifunction display**

single visual display unit that can present, either simultaneously or through a series of selectable pages, information from multiple systems or equipment. A multifunction display

may typically be part of an INS (for example, providing dedicated presentation modes conforming to both radar and ECDIS presentation requirements), and may replace their individual display units

3.35

operational display area

(MSC191/A) *area of the display used to graphically present electronic chart and/or radar information, excluding the user dialogue area. On the chart display this is the area of the chart presentation. On the radar display this is the area encompassing the radar video image*

3.36

past positions

(MSC191/A) *time-spaced marks on the past track of own ship, or a tracked radar or reported AIS target*

3.37

permanent

property of information as existing for a long time (or forever) without change

3.38

persistent

property of information as existing continuously

3.39

radar

system which complies with the requirements set forth in IMO Resolution MSC.192(79)

3.40

radar echo

returned radar signal (i.e. "paint") appearing in the radar video image

3.41

radar video image

set of displayed information constructed from radar echoes processed by anti-clutter means and other tools (for example, scan-to-scan correlation)

3.42

readily available

property of information as being directly accessible (for example, in a top-level menu, from a screen function, or an icon, etc.)

3.43

selected target

(MSC191/A) *target selected manually or automatically for the display of detailed alphanumeric data, information and text in a separate user dialogue area. The target is represented by a "selected target" symbol*

3.44

single user/operator action

use of a single hardware key, or the use of a cursor, to select a single display icon or window followed by the operation of a key

3.45**sleeping AIS target**

(MSC191/A) AIS target indicating the presence of a vessel equipped with AIS in a certain location. The target is represented by a “sleeping target” symbol indicating the vessel’s orientation. No additional information is presented until the AIS target is activated

3.46**standard display**

(MSC191/A) level of information that should be shown when a chart is first displayed on ECDIS. The level of the information it provides for route planning or route monitoring may be modified by the user according to the user’s needs

3.47**target tracking system**

system which complies with the requirements set forth in IMO Resolution MSC.192(79)

3.48**task-at-hand**

specific navigation-related activity performed by a user (for example, route planning, route monitoring, target tracking, collision avoidance, etc.)

3.49**tracked radar target**

object, fixed or moving, which is tracked by a radar or target tracking system

3.50**trial manoeuvre**

(MSC191/A) facility used to assist the user to perform a simulated manoeuvre for navigation and collision avoidance purposes, by displaying the predicted future status of all tracked radar and reported AIS targets as a result of the simulated manoeuvres

3.51**user-added electronic chart information**

electronic chart information manually entered by the user for presentation (for example, navigational notes, safety zones of interest, local notices to mariners, etc.)

3.52**user-configured presentation**

(MSC191/A) auxiliary presentation configured by the user for a specific task-at-hand. The presentation may include radar and/or electronic chart information, in combination with other navigational or ship related data

3.53**user dialogue area**

(MSC191/A) area of the display consisting of data fields and/or menus that is allocated to the interactive presentation and entry or selection of operational parameters, data, information, text and commands mainly in alphanumeric form

3.54**validity**

property of information as conforming to specified criteria, and the marking of such information as being “valid” or “invalid” (i.e. “good” or “no good”) for its intended use

3.55**warning**

(MSC.302/A) alert for condition requiring immediate attention, but no immediate action by the bridge team. Warnings are presented for precautionary reasons to make the bridge team

aware of changed conditions which are not immediately hazardous, but may become so if no action is taken, (see also important indication)

4 General requirements for all displays

The provisions of this clause are applicable to all displays on the bridge of a ship.

NOTE If display equipment is permitted to be monochrome by the applicable IMO performance standards, then the colour-related requirements specified in 4.2.1, 4.4.1, 4.6.1, 4.6.2, 4.6.3, 4.7.2 and 4.8.1 will not apply.

4.1 Application of IEC 60945

4.1.1 General requirements

4.1.1.1 Requirement

(MSC191/3) *In addition to the general requirements set forth in IMO Resolution A.694(17) and further specified in IEC 60945, display equipment shall meet the requirements set forth in IMO Resolution MSC.191(79) and further specified in this standard, as applicable.*

4.1.1.2 Methods of test and required results

See Annex D and G for guidance in the application of IEC 60945 for testing.

4.2 Arrangement of information

4.2.1 Consistency of layout

4.2.1.1 Requirement

(MSC191/5.1.1) *The presentation of information shall be consistent within the user interface with respect to screen layout and arrangement of information, for example, with respect to concepts, terminology, labelling and interaction paradigms used across the application and from screen to screen and/or from page to page. Data and control functions shall be logically grouped according to their function or the task-at-hand. Priority information essential to the task-at-hand shall be identified for each application (for example, radar, ECDIS, etc.), permanently or persistently displayed, as appropriate for the application, and presented to the user in a prominent manner by, for example, use of position (for example, screen location), size and colour.*

4.2.1.2 Methods of test and required results

The methods of test and the required results are as follows:

- verify that the arrangement, operation and identification of controls, screen displays and indications are in accordance with Annex E and IEC 60945, 4.2.1.2 through 4.2.1.5;
- confirm by analytical evaluation that the concepts, terminology, labelling and interaction paradigms, screen layout and arrangement of information is consistent from screen to screen and/or page to page;
- confirm by analytical evaluation that data and controls are logically grouped according to their function or the task-at-hand, as applicable;
- confirm by analytical evaluation that priority information essential to the task-at-hand is identified and permanently or persistently displayed in a prominent manner, as appropriate, for each application.

4.2.2 Consistent presentation of information

4.2.2.1 Requirement

(MSC191/5.1.2) *The presentation of information shall be consistent with respect to*

- numerical *values* (for example, position, speed, distance, time, etc.);
- *units*;
- *meaning* of information (for example, using the terms and abbreviations in Annex B);
- *sources* of information (for example, using the terms and abbreviations in Annex B);
- *validity* of information (see also 4.7.1 and 4.7.2); *and*
- *integrity* of information, if available (see also 4.7.1 and 4.7.2).

(See also IEC 60945, 4.2.1.5)

4.2.2.2 Methods of test and required results

Confirm by observation that numerical values and their units, the meaning and source(s) of information, and the validity and integrity of information are presented in a consistent manner.

4.2.3 Separation of operational display area

4.2.3.1 Requirement

(MSC191/5.1.3) *The presentation of information shall be clearly separated into one or more operational display areas (for example radar, chart) and one or more user dialogue areas (for example, menus, data, control functions).*

4.2.3.2 Methods of test and required results

Confirm by observation that the presentation is clearly separated into one or more operational display areas and one or more user dialogue areas.

4.3 Readability

4.3.1 Readability under all ambient light conditions

4.3.1.1 Requirement

(MSC191/5.2.1) *The presentation of alphanumeric data, text, symbols and other graphical information (for example, chart information, radar echoes or a radar video image, etc.) shall support readability from typical user positions (i.e. with respect to reading distance and viewing angles) under all ambient light conditions likely to be experienced on the bridge of a ship (for example, day, dusk and night), and with due consideration to the night vision of the officer of the watch. (See also 4.4.1, 7.2.1 and 7.6.1)*

Table 1 characterizes light levels for the ambient light conditions day, dusk and night.

Table 1 – Ambient light conditions

Ambient condition	Light level
Day	200 cd/m ² ± 50 %
Dusk	10 cd/m ² ± 50 %
Night	Darkness (i.e. where the display is the predominant light source)
NOTE Natural daylight is preferred for the day and dusk conditions.	

NOTE The “Day” colour table provided in the IHO ECDIS Presentation Library Ed. 3.3 uses a white background that may not support readability under all light conditions and may be a risk to safety of navigation for some navigational systems and equipment, including radar. Readability may be achieved by using the black background in the “Dusk” or “Night” colour tables provided in the IHO ECDIS Presentation Library Ed. 3.3, or the “Day Black Background” colour table provided in the IHO ECDIS Presentation Library Ed. 3.2, and adjusting brightness and contrast, if provided, for use under all light conditions.

Display equipment shall provide a luminance of at least 85 cd/m² measured at the centre of the display when set to the maximum brightness setting. The white luminance level of the display shall be adjustable down to 1 cd/m² or less and may be extinguishable below that point.

Transflective and reflective displays shall provide adjustable self-illumination suitable for all ambient light conditions likely to be experienced on the bridge of a ship (day, dusk and night) and with due consideration to the night vision of the officer of the watch. It shall be adjustable to produce display luminance dimmed down to 1 cd/m² or less and may be extinguishable below that point.

The luminance across the operational display area shall not have a variance of more than 30 % from the brightest point to the dimmest point.

NOTE Variance is determined by the equation: $1 - \left(\frac{L_{\min}}{L_{\max}} \right)$

where $L_{\min}$ is the minimum luminance and $L_{\max}$ is the maximum luminance measured across the operational display area, or the entire screen depending upon the application.

It shall be possible to select a presentation of alphanumeric data, text, symbols (see 4.5) and other graphical information using a lighter foreground (for instance character, symbol, etc.) against a dark background of high contrast, emitting as little light as possible at night. The brightest elements of the presentation shall be restricted to points and thin lines.

If display equipment is intended to present symbols for charted information (see 4.5.2), it shall provide a means or method for the user to verify that the colour black is visually distinguishable against a background set to dark grey and vice-versa.

NOTE The IHO ECDIS Presentation Library provides “black-adjust” symbols BKAJ1 and BKAJ2, for the colours black and grey, respectively.

4.3.1.2 Methods of test and required results

Set up the display equipment for measurements of luminance, contrast and colour according to the guidelines of IEC 61966-4 or the VESA Flat Panel Display Measurement (FPDM) standard.

NOTE Before measurements are taken, power up the display equipment and allow it to stabilize for the period of time specified by the manufacturer.

- a) Confirm by observation from two positions side-by-side at the manufacturer's recommended viewing distance that alphanumeric data, text, symbols and other graphical information are readable under the ambient light conditions described in Table 1.
- b) For direct view displays (for example CRT, LCD with backlight etc.) confirm by measurement using a test image with a white square at the centre of the operational display area (to be provided by the manufacturer) that the brightness can be varied from a minimum level of at most 1 cd/m² to a maximum level of at least 85 cd/m² measured under dark condition. Confirm by measurement that the values for brightness used for the setup are stable after the stabilisation period defined by the manufacturer.
- c) For transflective and reflective displays, confirm by measurement using a test image with a white square at the centre of the operational display area (to be provided by the manufacturer) that the brightness can be varied from a minimum level of at most 1 cd/m² under conditions of night ambient illumination to a maximum level of at least 85 cd/m² under conditions of daylight ambient illumination. Confirm by measurement that the values for brightness used for the setup are stable after the stabilisation period defined by the manufacturer. The ambient illumination levels shall be as specified in Table 1.

NOTE This test image should not be generated internally by the display equipment.

- d) Confirm by observation that alphanumeric data, text, symbols and other graphical information can be presented using a lighter foreground against a dark background.

- e) Confirm by measurement that when the display equipment is set to maximum brightness, the luminance does not vary across the operational display area by more than 30 % from the brightest point to the dimmest point.
- f) Confirm by observation that the brightest elements of the presentation in the night ambient light condition described in Table 1 are points and thin lines.
- g) Where display equipment is intended to present symbols for charted information confirm by observation that the user can verify that the colour black is visually distinguishable against a background set to dark grey, and vice-versa.

4.3.2 Legibility of alphanumeric data and text

4.3.2.1 Requirement

(MSC191/5.2.2) *Alphanumeric data and text shall be presented using a clearly legible non-italic, sans-serif font. The font size shall be appropriate for the viewing distance from user positions (i.e. with respect to reading distance and viewing angles) likely to be experienced on the bridge of a ship.*

The character height in millimetres shall be not less than 3,5 times the nominal viewing distance in metres. The manufacturer's documentation shall identify the nominal viewing distance for the display equipment.

4.3.2.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by observation that alphanumeric data and text is presented using non-italic, sans-serif font;
- b) confirm by measurement that the character height (i.e. the distance between the top and bottom edges of the smallest capital letter used in the presentation) in millimetres is not less than 3,5 times the nominal viewing distance in metres.

4.3.3 Presentation of text

4.3.3.1 Requirement

(MSC191/5.2.3) *Text shall be presented using simple unambiguous language that is easy to understand (for example, standard marine terminology or text that provides clear meaning by its context). Navigational terms and abbreviations shall be presented using the nomenclature set forth in Annex B.*

4.3.3.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by analytical evaluation that text is presented using simple unambiguous language;
- b) confirm by observation that navigational terms and abbreviations are presented using the nomenclature in Annex B.

4.3.4 Icons

4.3.4.1 Requirement

(MSC191/5.2.4) *When icons are used, their purpose shall be intuitively recognized by appearance, placement, and grouping. (See also ISO 80416-4).*

Icons used for data and control functions shall be presented according to Annex E.

4.3.4.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by analytical evaluation that icons and their purpose can be intuitively recognized by appearance, placement, and grouping;
- b) confirm by observation that icons used for data and control function are presented according to Annex E.

4.4 Colours and intensity

4.4.1 Discrimination of colours

4.4.1.1 Requirement

(MSC191/5.3.1) *The colours used for the presentation of alphanumeric data, text, symbols and other graphical information shall provide sufficient contrast for discrimination and identification against the background under all ambient light conditions likely to be experienced on the bridge of a ship (for example, day, dusk and night) and with due consideration to the night vision of the officer of the watch.*

(MSC191/5.3.2) *The colours and brightness shall take into account the ambient light conditions of day, dusk and night. The presentation shall support night viewing by showing lighter foreground information on a dark non-reflecting background.*

(MSC191/5.3.3) *The background colour and contrast shall be chosen to allow displayed information to be easily discriminated without degrading the colour coding aspects of the presentation.*

Display equipment may use a range of tones of basic colours, provided they are identifiable and visually distinguishable from each other. Colours used for the presentation of information in the user dialogue areas shall not detract from the presentation of information in the operational display area.

If display equipment is intended to present symbols for charted information, it shall use colours that comply with or are based upon the colours recommended for the IHO ECDIS Presentation Library in IHO S-52 and its Appendices, or an equivalent set of colour tables, as far as practical.

Monochrome displays may be provided when used for a single specific purpose (for example, speed log, echo-sounder) except where multicoloured displays are required by IMO performance standards or the Code on Alerts and Indicators.

NOTE The “Day” colour table provided in the IHO ECDIS Presentation Library Ed. 3.3 uses a white background that may not support readability under all light conditions and may be a risk to safety of navigation for some navigational systems and equipment, including radar. Readability may be achieved by using the black background in the “Dusk” or “Night” colour tables provided in the IHO ECDIS Presentation Library Ed. 3.3, or the “Day Black Background” colour table provided in the IHO ECDIS Presentation Library Ed. 3.2, and adjusting brightness and contrast, if provided, for use under all light conditions.

4.4.1.2 Methods of test and required results

The person conducting this test shall have passed the minimum colour vision and acuity tests required for users by IMO STCW Code Part B Table B-1/9 and have adapted to night viewing for 10 min before checking the night display.

- a) Confirm by observation that the colours used for the presentation of alphanumeric data, text, symbols and other graphical information provide sufficient contrast for identification and discrimination against the background under the ambient light conditions described in Table 1.

- b) Confirm by observation that the colours used for the presentation of alphanumeric data, text, symbols and other graphical information support night viewing by showing lighter foreground information on a dark non-reflecting background.
- c) Confirm by observation that the colours used for the presentation of alphanumeric data, text, symbols and other graphical information are identifiable and visually distinguishable from each other.
- d) Confirm by observation that the colours used in the user dialogue areas do not detract from the presentation of information in the operational display area.
- e) Where display equipment is intended to present symbols for charted information, confirm by analytical evaluation that the colours used conform to the IHO recommended colours in the IHO ECDIS Presentation Library, or an equivalent, as far as practical (see Clause D.6 for additional guidance).

4.5 Symbols

4.5.1 Operational information

4.5.1.1 Requirement

(MSC191/5.4.1) *Symbols used for the presentation of operational information* other than chart information shall comply with or be based upon the symbols set forth in Annex A.

(SN-Circ.243/1/3) *Where a standard symbols is not available, another symbol may be used, but this symbol shall not conflict with the symbols listed in annex A or in the ECDIS presentation library.* (For additional guidance see also ISO 80416-4)

Colours used for the presentation of operational information shall be discriminated from the colours used for the presentation of the radar image, target trails, additional processed radar information and electronic chart information.

A symbol shall subtend at least 5 mm/m (17 min of arc) at the nominal viewing distance. Where accurate colour identification of a symbol is required, the symbol shall subtend at least 8,7 mm/m (30 min of arc) at the nominal viewing distance. The use of spectrally extreme blue ($v' < 0,2$) shall be avoided for images subtending less than 35 mm/m (2° of arc) of viewing distance.

4.5.1.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by inspection of documented evidence that the symbols used to present operational information are presented in accordance with Annex A;
- b) confirm by measurement that the largest dimension of the symbol is at least 5 mm/m (17 min of arc) at the nominal viewing distance, and includes at least 16 pixels.
- c) where accurate colour identification is required for a symbol, confirm by measurement that the largest dimension of the symbol is at least 8,7 mm/m (30 min of arc) at the nominal viewing distance, and includes at least 29 pixels.

4.5.2 Electronic chart information

4.5.2.1 Requirement

(MSC191/5.4.2) *Symbols used for the presentation of vector format electronic chart information* shall comply with or be based upon the symbols recommended for the IHO ECDIS Presentation Library in IHO S-52 and its Appendices, or an equivalent symbol set, as far as practical.

NOTE Some symbols provided in the IHO ECDIS Presentation Library may not be suitable for the display of electronic chart information on radar or in a composite presentation based upon radar. IHO S-52 and its

Appendices allow minor deviations to symbology. It provides a framework and guidelines for chart symbolization from which manufacturers can derive a customized symbol set.

If symbols that deviate from the IHO ECDIS Presentation Library are used for the presentation of any chart information, then they shall:

- be legible;
- be certain and unambiguous in their meaning;
- be of sufficient size to support the nominal viewing distance (see also 4.3.2);
- have the same general shape as Presentation Library symbols used for the same or similar purpose(s).

Symbols added to the ECDIS Presentation Library shall not be confused with Presentation Library symbols.

4.5.2.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by inspection of documented evidence that the symbols used to present chart information are presented in accordance with IHO S-52 and its Appendices;
- b) where symbols deviate from the ECDIS Presentation Library, confirm by observation that they:
 - 1) are legible;
 - 2) are certain and unambiguous in their meaning;
 - 3) are of sufficient size to support the nominal viewing distance;
 - 4) have the same general shape as Presentation Library symbols used for the same or similar purposes;
- c) confirm by observation that symbols added to the ECDIS Presentation Library cannot be confused with Presentation Library symbols.

4.6 Colour coding of information

4.6.1 Colour coding for discrimination

4.6.1.1 Requirement

(MSC191/5.5.1) *If colour coding is used for discrimination or conspicuousness of alphanumeric text, symbols and other graphical information all colours in each colour table shall clearly differ from one another (see also 4.4.1.).*

4.6.1.2 Methods of test and required results

Confirm by observation that the colours within each colour table clearly differ from one another.

4.6.2 Colour coding of information

4.6.2.1 Requirement

(MSC191/5.5.2) *If colour coding is used, then the colour red shall be used for the coding of alert related information for alarm and emergency alarm conditions unless otherwise specified by the IMO (for example in tables 7.1.1 and 7.1.2 of the IMO A.1021(26) Code on Alerts and Indications, 2009).*

4.6.2.2 Methods of test and required results

Confirm by inspection of documented evidence that the colour red is used to indicate an alarm or emergency alarm condition unless otherwise specified by the IMO.

4.6.3 Colour coding in combination with other attributes

4.6.3.1 Requirement

(MSC191/5.5.3). *If colour coding is used it shall be used in combination with other symbol attributes, such as size, shape and orientation.*

A specific implementation shall not rely solely on a single saturated colour. If the display equipment technology relies on the separate transmission of primary colours, the presentation of alerts shall be visible and identifiable even after the failure of any one primary colour input to the display.

4.6.3.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by inspection of documented evidence that the colour coding is always combined with another symbol attribute;
- b) where the display equipment technology relies on the separate transmission of primary colours, confirm by observation that alerts remain identifiable even after transmission of each of the primary colours is disabled one at a time.

4.6.4 Flashing of information

4.6.4.1 Requirement

(MSC191/5.5.4) *Flashing of information shall be reserved for unacknowledged alerts*

4.6.4.2 Methods of test and required results

Confirm by observation that flashing of information is only used for unacknowledged alerts .

4.7 Integrity marking

4.7.1 Indication of source, validity and integrity status

4.7.1.1 Requirement

(MSC191/5.6.1) *The source, validity, and where possible, the integrity of information shall be indicated. Invalid information or information with low integrity shall be clearly marked qualitatively and/or quantitatively. Invalid information or information with low integrity may be quantitatively indicated by displaying absolute or percentage values.*

4.7.1.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by observation that the source of information can be indicated;
- b) confirm by observation that the validity of information is indicated;
- c) confirm by observation that the integrity of information is indicated, where available. Where integrity is indicated quantitatively, confirm by observation that either absolute values or percentage values are displayed.

4.7.2 Colour coding of validity and integrity

4.7.2.1 Requirement

(MSC191/5.6.2) If *colour coding is used*, then *information with low or doubtful integrity shall be qualitatively marked by using the colour as defined in Table 2, and invalid information shall be qualitatively marked by using the colour as defined in Table 2.*

4.7.2.2 Methods of test and required results

If colour coding is used, the methods of test and the required results are as follows:

- a) confirm by observation that the colour as defined in Table 2 is used to indicate information with low or doubtful integrity;
- b) confirm by observation that the colour as defined in Table 2 is used to indicate invalid information.

4.7.3 Indication of presentation failure

4.7.3.1 Requirement

(MSC191/5.6.3) In many cases, information on the display does not change frequently enough to make presentation failure immediately obvious to the user. *In order to show that the screen is being refreshed, a means or method shall be provided to immediately make the user aware of a presentation failure on an operational display (for example, "picture freeze").*

A conspicuous periodically time varying element shall be provided as a prominent indication of normal screen refresh (for example, dynamic display of time, two alternating dots, etc.).

4.7.3.2 Methods of test and required results

Confirm by observation that a conspicuous time-varying indication is provided in all presentation modes.

4.8 Alerts and indications

4.8.1 Operational status

4.8.1.1 Requirement

(MSC191/5.7.1) *The operational status of information shall be indicated as follows unless otherwise specified by the IMO (for example in tables 7.1.1 and 7.1.2 of the Code on Alerts and Indications, 2009):*

The handling of unacknowledged warnings shall be in compliance with (MSC 302/7.6.2).

An unacknowledged warning shall be:

- .1 repeated as a warning after a limited time period not exceeding 5 min; or*
- .2 changed to alarm priority after a limited time period not exceeding 5 min; or*
- .3 changed to alarm priority after a user selectable time not more than 5 min, if provided; or*
- .4 changed to alarm priority, as required by specific requirements for the individual equipment and system*

Table 2 – Operational status

Status	Visual Indication	Audible Signal
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Status	Visual Indication	Audible Signal
Emergency alarm	As specified in Table 7.1.1 of the Code on Alerts and Indications 2009 (IMO resolution A.1021(26))	As specified in Tables 7.1.1 and 7.2 of the Code on Alerts and Indications 2009 (IMO resolution A.1021(26))
<i>Alarm, not acknowledged</i>	<i>Red, Flashing</i>	<i>Accompanied by an audible signal, as 3 short audible signals repeated every 7 to 10 seconds</i>
Alarm, silenced	Red, Flashing	Silent
<i>Alarm, acknowledged</i>	<i>Red</i>	<i>Suppression of audible signal</i>
<i>Invalid information</i>	<i>Yellowish orange</i>	<i>Silent</i>
<i>Information with low integrity</i>	<i>Yellow</i>	<i>Silent</i>
Warnings, not acknowledged	Yellowish orange, Flashing	Accompanied by an audible signal, as 2 short audible signals, to be repeated at least once per 5 minutes or be replaced by an alarm
Warnings, silenced	Yellowish orange, Flashing	Silent
Warnings, acknowledged	Yellowish orange	Silent
Caution	Yellow	Silent
<i>Important Indications</i>	<i>Yellow</i>	<i>Silent</i>
Indication	No special requirement	Silent
<i>Normal State</i>	<i>Optionally Green</i>	<i>Silent</i>

NOTE Code on Alerts and Indications 2009 (IMO resolution A.1021(26)) specify frequency range (in 5.11) and sound pressure level (in 5.13) for audible signal.

4.8.1.2 Method of test and required results

Confirm by inspection of documented evidence that alerts and indications are presented in accordance with Table 2.

4.8.2 List of alerts

4.8.2.1 Requirement

(MSC191/5.7.2) *A list of alerts shall be provided based on the sequence of occurrence. Additional indication of priority, as set by the user, shall be provided on displays that present alerts from multiple sources. Alerts that have been acknowledged and are no longer relevant shall be deleted from the list of alerts, but may be retained in an alert history list.*

4.8.2.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by observation that the display equipment provides a sequential list of alerts;
- b) where display equipment supports the presentation of alerts from multiple sources (for example, from multiple navigational systems and equipment):
 - 1) confirm by observation that the user can set a priority for the alerts;
 - 2) confirm by observation that an indication of priority is included in the list of alerts;
- c) confirm by analytical evaluation that acknowledged alerts which are no longer relevant are deleted from the list of alerts.

4.8.3 Alert related information from multiple sources

4.8.3.1 Requirement

(MSC191/5.7.3) *If a single display is used to present alert related information from multiple navigational systems and equipment, then the presentation of alerts and indications shall be consistent for the display of:*

- *the time of alert occurrence,*
- *the cause of the alert,*
- *the source of the alert, and*
- *the status of the alert (for example, acknowledged, not acknowledged).*

4.8.3.2 Methods of test and required results

Where display equipment supports the presentation of alerts and indications from multiple navigational systems and equipment, confirm by observation that the presentation of alert related information is consistent with respect to the time of alert occurrence, the cause of the alert, the source of the alert, and the status of the alert.

4.9 Presentation mode

4.9.1 Indication of presentation mode in use

4.9.1.1 Requirement

(MSC191/5.8) *If displays are capable of presenting information in different modes, then there shall be a clear indication of the modes in use, for example:*

- *orientation* (north-up, course-up, head-up);
- *stabilisation* (ground-stabilised, sea-stabilised);
- *motion* (true, relative); *and*
- *chart projection* (Mercator, polyconic, etc.).

NOTE The indication of chart projection is only required when electronic chart information is presented. It may be provided to the user on request.

4.9.1.2 Methods of test and required results

Confirm by observation that the presentation modes in use are clearly indicated.

4.10 Manuals

4.10.1 User manuals, instructions and reference guides

4.10.1.1 Requirement

(MSC191/5.9) *The user manual and instructions and reference guides shall be available in the English language at least. The user manual or reference guide shall include a list of all terms, abbreviations, symbols, icons and their explanations presented by the system or equipment. (See also Annexes A, B and E.)*

4.10.1.2 Methods of test and required results

The methods of test and the required results are as follows:

- a) confirm by observation that user manual, instructions and reference guide are available in the English language;

- b) confirm by inspection of documented evidence that the user manual and/or reference guide includes a list of all terms, abbreviations, symbols, icons and their explanations used by the system.

5 Presentation of operational information

The provisions of this clause are applicable to displays on the bridge of a ship that provide functionality as described in the sub clauses.

5.1 Presentation of own ship information

5.1.1 Graphical representation of own ship

5.1.1.1 Requirement

(MSC191/6.1.1) *When a graphical representation of own ship is provided, it shall be possible for the user to select either a true scaled ship's outline or a simplified symbol as set forth in Annex A. The size of the ship's true scaled outline or the simplified symbol in the graphical presentation shall be the true scale size of the ship or 6 mm, at a nominal viewing distance of 1 m, whichever is greater.*

NOTE The manufacturer should adjust the symbol sizes to properly account for the nominal viewing distance of the display equipment.

Display equipment may (unless stipulated as mandatory in an equipment standard) provide the capability to automatically switch from the ship's true scaled outline to the simplified symbol when the beam of own ship's true scale outline is less than 3 mm, and vice versa. The true scaled outline shall not be used when the heading is not known in a gyro/THD-stabilized mode. The user shall always have the capability to select the simplified symbol in lieu of the scaled ship's outline.

(MSC191/6.1.2) *A heading line, and where appropriate a velocity vector, shall be associated with own ship symbol and shall originate at the position of the consistent common reference point (CCRP) as set forth in Annex A.*

The combination of the heading line and beam line (the minimised symbol) may be used as an alternative to the simplified symbol and may be selectable as such. Display equipment may provide the capability to automatically switch from the ship's true scaled outline to the heading and beam line when the beam of own ship's true scale outline is less than 3 mm, and vice versa.

5.1.1.2 Methods of test and required results

Where display equipment provides a graphical representation of own ship:

- a) confirm by observation that the system provides a ship's true scaled outline and a simplified symbol in accordance with Annex A;
- b) confirm by observation that the display equipment provides the user with the capability to select the representation of own ship as either the ship's true scaled outline or the simplified symbol;
- c) confirm by measurement that the size of the ship's outline is correct for the scale of the display;
- d) confirm by observation that the simplified symbol is automatically selected when the beam of the ship's true scaled outline is less than 3 mm, and vice versa;
- e) confirm by observation that the display equipment provides a heading line in accordance with Annex A;
- f) confirm by observation that the display equipment provides a velocity vector in accordance with Annex A.