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Entwurf

**Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt –
Integriertes Kommunikationssystem (ICS) –
Betriebs- und Leistungsanforderungen; Prüfverfahren und geforderte Prüfergebnisse
(IEC 80/781/CDV:2016);
Englische Fassung FprEN 62940:2016**

Maritime navigation and radiocommunication equipment and systems –
Integrated communication system (ICS) –
Operational and performance requirements, methods of testing and required test results
(IEC 80/781/CDV:2016);
English version FprEN 62940:2016

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2016-05-20 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.

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Gesamtumfang 52 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Nationales Vorwort

Die Englische Fassung des europäischen Dokuments FprEN 62940:2016 „Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt – Integriertes Kommunikationssystem (ICS) – Betriebs- und Leistungsanforderungen; Prüfverfahren und geforderte Prüfergebnisse“ (Entwurf in der Umfrage) ist unverändert in diesen Norm-Entwurf übernommen worden.

Die Internationale Elektrotechnische Kommission (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. Dem entsprechend ist das internationale Dokument IEC 80/781/CDV:2016 „Maritime navigation and radiocommunication equipment and systems – Integrated communication system (ICS) – Operational and performance requirements, methods of testing and required test results“ unverändert in den Entwurf FprEN 62940:2016 übernommen worden.

Das internationale Dokument wurde vom TC 80 „Maritime navigation and radiocommunication equipment and systems“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet.

Bei der Abstimmung zu dem Europäischen Schluss-Entwurf bei CENELEC und dem Internationalen Schluss-Entwurf bei IEC [Final Draft International Standard (FDIS)] sind jeweils nur „JA/NEIN“-Entscheidungen möglich, wobei „NEIN“-Entscheidungen fundiert begründet werden müssen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

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

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Der Zusammenhang der zitierten Dokumente mit den entsprechenden Deutschen Dokumenten 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.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründet, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Diese Bedingungen sind für die vorliegende Norm erfüllt.

Da sich die Benutzer des vorliegenden Normentwurfs der englischen Sprache als Fachsprache bedienen, wird die englische Fassung der FprEN 62940 veröffentlicht. Zu deren Abschnitt 1, der den Anwendungsbereich festlegt, und deren Abschnitt 3, der die Begriffe festlegt, wurde eine Übersetzung angefertigt und als informativer Nationaler Anhang NA des vorliegenden Normentwurfs hinzugefügt. Für viele der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Dieser Normentwurf steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

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Nationaler Anhang NA (informativ)

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.

1 Anwendungsbereich

Diese Europäische Norm legt die minimalen betrieblichen und Leistungsanforderungen, technischen Eigenschaften, Prüfverfahren und geforderte Prüfergebnisse für integrierte Kommunikationssysteme (ICS), zur externen Kommunikation vom Schiff und zur Notfall- und sicherheitsrelevanten Kommunikation (GMDSS) und um die Funktionen des On-board-Routings dieser Kommunikation zu erbringen, auf Schiffen fest. Diese Norm berücksichtigt die IMO-Resolution A.694(17) und ist mit DIN EN 60945 verbunden. Wenn eine Anforderung der vorliegenden Norm von DIN EN 60945 abweicht, dann gilt vorrangig die Anforderung der vorliegenden Norm.

Diese Norm umfasst die anwendbaren Teile der Leistungsnormen entsprechend der IMO-Resolution A.811(19) für ein integriertes Kommunikationssystem. Es umfasst auch die anwendbaren Anforderungen zur Darstellung von Information nach IMO-Resolution MSC.191(79), die mit DIN EN 62288 verbunden ist, den anwendbaren Anforderungen für das Brücken-Alert-Management-System nach den Anforderungen gemäß IMO-Resolution MSC.302(87), basierend auf und in Übereinstimmung mit den anwendbaren Anforderungen für Ethernet-Verbindungen nach DIN EN 61162-450.

Das integrierte Kommunikationssystem (ICS) ist ein System, in dem einzelne Funkkommunikationsgeräte und Installationen als Teilsysteme genutzt werden, das heißt, sie ohne Bedarf an eigenen Bedieneinheiten und Displays verfügbar zu machen und Eingaben von einer Mensch-Maschine-Schnittstelle für Kommunikation (COM-HMI) zu akzeptieren. Jedes Teilsystem ist in Übereinstimmung mit den Anforderungen einer Typzulassung für das jeweilige Teilsystem, wo anwendbar, und ist in Übereinstimmung mit den Schnittstellenanforderungen in der vorliegenden Norm. Ein ICS besteht aus mindestens zwei einzelnen GMDSS-Teilsystemen.

Die COM-HMI ist so gestaltet, dass sie an einem Brückenarbeitsplatz entweder für die Kommunikation bestimmt ist oder als Teil einer Multifunktionsanzeige verfügbar gemacht werden kann.

3 Begriffe und Abkürzungen

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

3.1 Begriffe

3.1.1

Mensch-Maschine-Schnittstelle für die Kommunikation

(en: Communications human machine interface)

COM-HMI

Mensch-Maschine-Schnittstelle für die Bedienung von Funkkommunikationsgeräten und Darstellung von Kommunikationsaufgaben auf der Brücke

3.1.2**konsistentes gemeinsames Bezugssystem**

(en: Consistent Common Reference system)

CCRS

Teilsystem oder Funktion eines integrierten Navigationssystems zur Erfassung, Verarbeitung, Speicherung, Überwachung und Verteilung von Daten und Information, das eine identische und verbindliche Referenz für Teilsysteme und für Folgefunktionen in einem integrierten Navigationssystem und für andere angeschlossene Geräte, wenn vorhanden, darstellt

3.1.3**integriertes Kommunikationssystem**

(en: Integrated communication system)

ICS

integriertes Kommunikationssystem, um Kommunikation vom Schiff für Routine sowie Seenot- und Sicherheits-Kommunikation (GMDSS) auszuführen und die Funktionen zur Verteilung dieser Kommunikation an Bord zu erbringen

3.1.4**Funkkommunikation**

(en: Radio communication)

drahtlose Informationsübertragung

3.1.5**abgesetzte Mensch-Maschine-Kommunikationsschnittstelle**

(en: Remote Communications human machine interface)

Remote COM-HMI

Mensch-Maschine-Schnittstelle, die abgesetzt vom integrierten Kommunikationssystem zur Bedienung von Funkkommunikationsgeräten und Darstellung von Kommunikationsaufgaben angeordnet ist

3.1.6**Teilsystem**

(en: Subsystem)

Kommunikationseinrichtung innerhalb des ICS

3.2 Abkürzungen

AIS	automatisches Identifikationssystem	(en: Automatic identification system)
BAM	Brücken Alert Management System	(en: Bridge alert management)
BNWAS	Brückenwachalarmanlagen	(en: Bridge navigational watch alarm system)
DSC	digitaler Selektivruf	(en: Digital selective calling)
EPFS	elektronisches Positionsbestimmungssystem	(en: Electronic position fixing system)
EUT	Prüfling	(en: Equipment under test)
FMEA	Fehlermöglichkeits- und -einflussanalyse“	(en: Failure Mode and Effects Analysis)
FTP	Dateiübertragungsprotokoll	(en: File Transfer Protocol)
GMDSS	weltweites Seenot- und Sicherheitsfunksystem	(en: Global maritime distress and safety system)
HMI	Mensch-Maschine-Schnittstelle“ (MMS)	(en: Human machine interface)
HTTP	Hypertext-Übertragungsprotokoll	(en: Hypertext Transfer Protocol)
IMAP	interaktives Zugriffsprotokoll für Meldungen	(en: Internet Message Access Protocol)
INS	integriertes Navigationssystem	(en: Integrated navigation System)
MFD	Multifunktionsanzeige	(en: Multi-function display)
MSI	maritime Sicherheitsinformation	(en: Maritime safety information)
SMTP	einfaches E-Mail-Transportprotokoll	(en: Simple Mail Transfer protocol)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND
RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –****Integrated communication system (ICS) –
Operational and performance requirements,
methods of testing and required test results**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62940 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/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.

53 The committee has decided that the contents of this publication will remain unchanged until
54 the stability date¹ indicated on the IEC web site under "http://webstore.iec.ch" in the data
55 related to the specific publication. At this date, the publication will be

- 56 • reconfirmed,
57 • withdrawn,
58 • replaced by a revised edition, or
59 • amended.
60

¹ The National Committees are requested to note that for this publication the stability date is 2019

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Integrated communication system (ICS) – Operational and performance requirements, methods of testing and required test results

1 Scope

This International Standard specifies the minimum operational and performance requirements, technical characteristics and methods of testing, and required test results, for shipborne integrated communication systems (ICS) designed to perform ship external communication and distress and safety communications (GMDSS) and the functions of onboard routing of this communication. It takes account of IMO resolution A.694(17) and is associated with IEC 60945. When a requirement in this standard is different from IEC 60945, the requirement in this standard takes precedence.

This standard incorporates the applicable parts of the performance standards included in IMO Resolution A.811(19) for an integrated radiocommunication system. It also incorporates the applicable requirements for the presentation of information included in IMO Resolution MSC.191(79) which is associated with IEC 62288, applicable requirements for bridge alert management included in IMO Resolution MSC.302(87), based on, and in compliance with applicable requirements for Ethernet interconnection in IEC 61162-450.

The ICS is a system in which individual radiocommunication equipment and installations are used as subsystems, i.e. without the need for their own control units, providing outputs to and accepting inputs from a communications human machine interface (COM-HMI). Each subsystem is in compliance with the type approval requirements for that subsystem where applicable, and is in compliance with the interface requirements in this standard. An ICS consists of at least two individual GMDSS subsystems.

The COM-HMI is designed so that it can be made available on a bridge workstation either dedicated to communications or as part of a multi-function display.

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 testing and required test results*

IEC 61162-1, *Maritime navigation and radio communication equipment and systems – Digital interfaces - Part 1: Single talker and multiple listeners*

IEC 61162-450, *Maritime navigation and radio communication equipment and systems – Digital interfaces - Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 61162-460, *Maritime navigation and radiocommunication equipment and systems - Digital interface - Part 460: Multiple talker and multiple listeners - Ethernet interconnection - Safety and security*

IEC 61924-2: 2012, *Maritime navigation and radiocommunication equipment and systems - Integrated navigation systems - Part 2: Modular structure for INS - Operational and performance requirements, methods of testing and required test results*

108 IEC 62288, *Maritime navigation and radiocommunication equipment and systems –*
109 *Presentation of navigation-related information on shipborne navigational displays – General*
110 *requirements, methods of testing and required results*

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

114 IMO Resolution MSC.191(79), *Performance standards for the presentation of navigation-*
115 *related information on shipborne navigational displays*

116 IMO MSC.1/Circ.1389, *Guidance on procedures for updating shipborne navigation and*
117 *communication equipment*

118 ITU-R Recommendation M.493, *Digital selective-calling system for use in the maritime mobile*
119 *service*

120 **3 Terms, definitions and abbreviations**

121 **3.1 Terms and definitions**

122 For the purposes of this document, the following definitions apply:

123 **3.1.1**

124 **Communications human machine interface**

125 **COM-HMI**

126 human machine interface for presentation and handling of communication tasks on the bridge

127 **3.1.2**

128 **Consistent Common Reference system**

129 **CCRS**

130 sub-system or function of an INS for acquisition, processing, storage, surveillance and
131 distribution of data and information providing identical and obligatory reference to sub-
132 systems and subsequent functions within an INS and to other connected equipment, if
133 available

134 **3.1.3**

135 **Integrated communication system**

136 **ICS**

137 composite communication system designed to perform ship external communication and
138 distress and safety communications (GMDSS) and the functions of onboard routing of this
139 communication

140 **3.1.4**

141 **Radio communication**

142 wireless transmission of information

143 Note 1 to entry: Examples of radio communication are voice radio communication and the wireless exchange of
144 data.

145 **3.1.5**

146 **Remote Communications human machine interface**

147 **Remote COM-HMI**

148 human machine interface for presentation and handling of communication tasks, placed
149 outside the ICS

150 **3.1.6**

151 **Subsystem**

152 any communication related device within the ICS

153 **3.2 Abbreviations**

154 AIS Automatic identification system

155 BAM Bridge alert management

156	BNWAS	Bridge navigational watch alarm system
157	DSC	Digital selective calling
158	EPFS	Electronic position fixing system
159	EUT	Equipment under test
160	FMEA	Failure Mode and Effects Analysis
161	FTP	File Transfer Protocol
162	GMDSS	Global maritime distress and safety system
163	HMI	Human machine interface
164	HTTP	Hypertext Transfer Protocol
165	IMAP	Internet Message Access Protocol
166	INS	Integrated navigation System
167	MFD	Multi-function display
168	MSI	Maritime safety information
169	SMTP	Simple Mail Transfer protocol

170 **4 General and operational requirements**

171 **4.1 General requirements**

172 **4.1.1 Requirements**

173 The ICS shall meet the general requirements set out in resolution A.694(17) as further
 174 specified in IEC 60945 appropriate to their category e.g. “protected”. The manufacturer shall
 175 declare any preconditioning required before environmental checks. For the purposes of this
 176 standard, the following definitions for “performance check” and “performance test”, required
 177 by IEC 60945, shall apply:

Performance check	Reconfigure the EUT and check by non-quantitative visual checks that the system is still operative.
-------------------	---

Performance test	Identical to the “performance check”.
------------------	---------------------------------------

178 The manufacturer shall declare the equipment to be tested and the tasks and functions that it
 179 performs. The EUT shall be installed in compliance with the manufacturer’s installation
 180 manual. Where equipment is divided the entire configuration shall be tested together.

181 The manufacturer shall declare the:

- 182 • physical parts involved;
- 183 • location of tasks and functions;
- 184 • general data flow between physical and/or logical parts;
- 185 • dependencies between tasks and functions.

186 NOTE Typical examples are hardware overviews down to the lowest replaceable unit, block diagrams or high
 187 functional level software descriptions.

188 The acoustic alarm level may be capable of being adjustable below the level defined in
 189 IEC 60945.

190 The ICS shall meet the requirements for the presentation of information on shipborne displays
 191 set out in resolution MSC.191(79) as further specified in IEC 62288.

192 The ICS shall meet the requirements for alert management as an alert source (See Clause 6
 193 and Clause 7).

4.1.2 Methods of testing and required test results

Verify conformance with A.694(17) by testing in accordance with IEC 60945.

Verify conformance with MSC.191(79) by testing in accordance with IEC 62288.

4.2 Test site

Unless otherwise stated all tests in this standard are to be executed in a laboratory environment with a simulator arrangement or via live “on-air” tests on the actual equipment.

For a simulator arrangement the following characteristics are required:

- capable of simulating the “air-interface” for transmission of radio signals for the equipment included in the ICS;
- capable of simulating AIS targets and other AIS messages.

The simulated signals shall be in accordance with the applicable international standards. The output signals shall comply with IEC 61162-1 and with the types of interfaces supported by the EUT according to the manufacturer’s declaration.

4.3 Functional requirements**4.3.1 GMDSS equipment****4.3.1.1 Requirements**

The manufacturer shall declare which selected functions of the GMDSS are integrated in the ICS. All functional requirements of the GMDSS equipment integrated into the ICS shall conform to the performance standards for that equipment. For functionality of DSC the latest version of Recommendation ITU-R M.493 is applicable.

NOTE The functions of the GMDSS are given in SOLAS regulation IV/4 and the performance standards are given in IMO Resolutions which are referenced in SOLAS regulation IV/14. The relevant Resolutions are given in the Bibliography.

A minimum of two independent COM-HMI are required in the ICS.

The implementation of a specific item of GMDSS equipment or its installation shall not impair the availability, operation or functionality of another equipment integrated into the ICS.

For radio transmission at least two simultaneous operations are required. All receiver functions shall be available simultaneously.

4.3.1.2 Methods of testing and required test results

Confirm by inspection of the documented evidence that the documents provided by the manufacturer declare the configuration of the ICS.

Confirm by observation that at least two COM-HMIs are available in the ICS.

Confirm by observation or analytic evaluation, that the implementation of a specific item of GMDSS equipment or its installation does not impair availability, operation or functionality of another equipment integrated into the ICS.

Confirm by observation that for radio transmission at least two simultaneous operations are possible, and that all receiver functions are available simultaneously.

4.3.2 Non-GMDSS equipment/function**4.3.2.1 Requirements**

The ICS may integrate non-GMDSS communication and other equipment/functions. The manufacturer shall declare which non-GMDSS communication and other equipment/functions are integrated in the ICS. Such equipment/functions shall comply with IEC 60945 and the ICS shall be compliant with the relevant interface requirements of IEC 61162-1.

237 The implementation of a specific item of non-GMDSS equipment or its installation shall not
238 impair the availability, operation or functionality of another equipment integrated into the ICS.

239 4.3.2.2 Methods of testing and required test results

240 Confirm by inspection of documented evidence whether non-GMDSS communication
241 equipment/functions are integrated in the ICS.

242 Confirm by inspection of documented evidence that such equipment complies with the
243 relevant interfaces requirements in IEC 61162-1.

244 Confirm by inspection of documented evidence that such equipment complies with the
245 relevant requirements in IEC 60945.

246 Confirm by observation or analytic evaluation, that the implementation of a specific item of
247 non-GMDSS equipment or its installation does not impair the availability, operation or
248 functionality of another equipment integrated into the ICS.

249 4.4 Operational requirements of ICS

250 4.4.1 Requirements

251 The ICS shall:

- 252 a) comprise at least two COM-HMI capable of performing GMDSS functions for the included
253 GMDSS equipment;
- 254 b) ensure that initiating a distress alert has priority over all other functions of the ICS;
- 255 c) be capable of performing all distress functions, for the included GMDSS equipment;
- 256 d) include a printing capability if required by individual IMO performance standards and not
257 provided by the individual equipment;
- 258 e) make MSI available based on a common storage media if provided (see 4.5);
- 259 f) have facilities for automatic reception of position and time data from the ship's CCRS, in
260 addition to provision for manual input of this data (if required);
- 261 g) have a power supply arrangement which ensures that it is not possible to inadvertently
262 switch off any part of the ICS;
- 263 h) have a failure analysis, at ICS functional level, performed and documented for the ICS.
264 The failure analysis shall verify that the ICS is designed on "fail-to-safe" principle and that
265 failure of one part of the integrated system should not affect the functionality of other
266 parts, except for those functions directly dependent on the defective part;

267 NOTE IEC 60812 (FMEA) describes how failure analysis can be performed.

- 268 i) if external access (e.g. remote maintenance) is provided, have a 460-Gateway as
269 specified in IEC 61162-460.

270 4.4.2 Methods of testing and required test results

271 Perform the following:

- 272 a) confirm by inspection of documented evidence that the EUT comprises at least two
273 COM-HMIs capable of performing GMDSS functions for the GMDSS equipment included
274 into the EUT;
- 275 b) confirm by analytic evaluation that initiating a distress alert has priority over all other
276 functions of the EUT;
- 277 c) confirm by observation that the EUT is capable of performing all distress functions for the
278 GMDSS equipment included into the EUT;
- 279 d) confirm by observation that the EUT provides printing capability, if required by the
280 individual performance standards related to the GMDSS equipment included into the EUT;
- 281 e) see test for 4.5;
- 282 f) confirm by observation that the EUT has facilities both for automatic reception of position
283 and time data and for manual input from the ship's CCRS for position and time data;

- g) confirm by analytic evaluation that the power supply arrangements for the EUT are such that it is not possible to inadvertently switch off any part of the EUT;
- h) use the manufacturer's documentation for failure analysis to select randomly 3 cases from the failure analysis and confirm by observation that what is documented in the failure analysis happens in the EUT;
- i) if external access (e.g. remote maintenance) is provided, confirm by inspection of documented evidence that a 460-Gateway, as specified in IEC 61162-460, is provided.

4.5 Operational requirements of the COM-HMI

4.5.1 General

4.5.1.1 Requirements

Each of the COM-HMI shall:

- have consistent and identical lay out of the user interfaces;
- have consistent and identical access to each function for different subsystems;

NOTE 1 Use of different screen sizes is allowed.

- be capable of being operated independently of each other.

Only one COM-HMI, at one indicated workstation or MFD task station shall be in control of configuration per "non-shareable function" at any time, and only one COM-HMI or MFD task station shall be assigned to accept control commands per "non-shareable function" at any time.

NOTE 2 An example of a non-shareable functions is VHF voice, an example of a sharable function is making a text message for Inmarsat-C.

It shall be visually indicated to the bridge team, if not otherwise obvious, which COM-HMI is in control of which functions. Means shall be available on the COM-HMI to take over control of individual functions to that COM-HMI.

4.5.1.2 Methods of testing and required test results

Confirm by observation that each COM-HMI has consistent and identical layout of the user interface for each of the functions provided.

Confirm by observation that there is consistent and similar access to each function of the different subsystems provided on the COM-HMIs.

Access different functions on different COM-HMIs and confirm by observation that it is possible to operate the COM-HMIs independently of each other.

Access a "non-shareable function" on one COM-HMI and do not complete the operation. Confirm by observation that it is indicated on the COM-HMI used that there indeed is access to the "non-shareable function". Then attempt to access the same function on another COM-HMI. Confirm by observation that access to the "non-shareable function" is not accepted. Confirm by observation that a function to take over control is present. Subsequently exercise that function and confirm by observation that control and access is transferred.

4.5.2 Interconnection with Automatic Identification Systems

4.5.2.1 Requirements

Where interconnection with AIS is provided, the ICS shall be capable of:

- a) displaying notices using the same rules as for MSI (see 4.5.4);

NOTE Notices use Application Specific Message (ASM) Functional Identifiers (FI) as identified in Tables 6 and 7.

- b) sending and receiving broadcast and addressed AIS safety-related messages;

- c) correlating distress information received by DSC with available received AIS ship information and displaying the results in accordance with 4.5.3.2.

4.5.2.2 Methods of testing and required test results

If an AIS interface is provided, use a simulator to send to the EUT:

a) VDM sentences containing at least ten notices using ASM FI 22 and 23 and confirm by observation that the notices are available for display using same rules as for MSI (see 4.4.4);

b) VDM sentences containing at least ten addressed and broadcast safety related messages and confirm by observation that those messages are available for display. Create an addressed and a broadcast message and confirm by observation that data sentences ABM and BBM are transmitted with the proper format. Acknowledge one of the transmitted addressed safety related message by sending an ABK sentence to the EUT and confirm by observation that the addressed message is displayed as acknowledged.

4.5.3 GMDSS COM-HMI

4.5.3.1 Distress alerting

4.5.3.1.1 Requirements

The COM-HMI for GMDSS functions shall include a dedicated distress button that has no other function than activating distress alerts. An example of an ICS supporting distress communications is shown in Figure 1.

The dedicated distress button shall not be any key of a digital input panel or a keyboard provided on the equipment. The distress button shall be clearly identified and protected against inadvertent activation, requiring at least two independent actions.

NOTE these requirements conform to IMO Circular MSC/Circ.862.

The use of the dedicated distress button shall activate distress alerts on all GMDSS communication subsystems in the ICS when continuously pressed for an activation period of at least 3 s. In this period the display on the COM-HMI used shall show: "Transmitting undesignated DISTRESS using [MF, HF, VHF, Inmarsat-C] in [Start counter 3 -2 -1] seconds" with a visual indication following the count down, and an audible signal of frequency 2 kHz with a sequence of on 500 ms off 500 ms synchronized with the count down. The COM-HMI shall indicate distress status/progress for each of the radio systems, to give the operator the state of own distress.

If the dedicated distress button is released before the distress alert is transmitted, the distress alert procedure shall be interrupted, and a dedicated distress menu shall be made available on the COM-HMI if multiple distress capable devices/functions are available in the ICS.

A flow chart describing the distress alert procedure is shown in Annex A Figure A.1. The follow up voice procedure is shown in Annex A Figure A.2.

4.5.3.1.2 Methods of testing and required test results

Confirm by observation that it is possible to initiate transmitting distress alerts from the COM-HMI. Repeat this test for each provided distress method.

For the distress function confirm by observation that:

- a) a dedicated distress button which is not used for any other function is provided;
- b) the distress alert cannot be activated by any combination of other keys on the COM-HMI;
- c) the distress button is clearly identified and protected against inadvertent activation by at least two actions;
- d) the text in 4.5.3.1.1 is displayed on the COM-HMI;
- e) if the dedicated distress button is pressed for at least 3 s then a distress alert is initiated in all GMDSS subsystem integrated in the ICS and that the text in Annex A Figure A.1 is shown on the COM-HMI;
- f) if the ICS includes only one distress capable function and if the dedicated distress button is released before the distress call is transmitted then the alert procedure is interrupted;
- g) if the ICS includes more than one distress capable function and the dedicated distress button is pressed for less than 3 s then the alert procedure is interrupted and a dedicated distress menu shown in Annex A Figure A.1 becomes available;