SVENSK STANDARD SS-EN IEC 63154

Fastställd	Utgåva	Sida	Ansvarig kommitté
2021-10-20	1	1 (1+64)	SEK TK 80

Marin navigerings- och kommunikationsutrustning – Cybersäkerhet – Generella fordringar, provningsmetoder och erforderliga provningsresultat

Maritime navigation and radiocommunication equipment and systems –
Cybersecurity –
General requirements, methods of testing and required test results

Som svensk standard gäller europastandarden EN IEC 63154:2021. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 63154:2021.

Nationellt förord

Europastandarden EN IEC 63154:2021

består av:

- **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
- **IEC 63154, First edition, 2021 - Maritime navigation and radiocommunication equipment and systems - Cybersecurity - General requirements, methods of testing and required test results**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 47.020.70; 35.030.00

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 63154

April 2021

ICS 35.030; 47.020.70

English Version

Maritime navigation and radiocommunication equipment and systems - Cybersecurity - General requirements, methods of testing and required test results (IEC 63154:2021)

Matériels et systèmes de navigation et de radiocommunication maritimes - Sécurité informatique - Exigences générales, méthodes d'essai et résultats d'essai exigés
(IEC 63154:2021)

Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Cyber-Security - Allgemeine Anforderungen, Prüfverfahren und geforderte Prüfergebnisse
(IEC 63154:2021)

This European Standard was approved by CENELEC on 2021-04-13. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 63154:2021 E

European foreword

The text of document 80/984/FDIS, future edition 1 of IEC 63154, prepared by IEC/TC 80 "Maritime navigation and radiocommunication equipment and systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63154:2021.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2022-01-13
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2024-04-13

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 63154:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61162-1	NOTE	Harmonized as EN 61162-1
IEC 61162-2	NOTE	Harmonized as EN 61162-2
IEC 61162-3	NOTE	Harmonized as EN 61162-3
IEC 61993-2:2018	NOTE	Harmonized as EN IEC 61993-2:2018 (not modified)
IEC 62443 (series)	NOTE	Harmonized as EN IEC 62443 (series)

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60945	2002	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	2002
IEC 61162-450	-	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 450: Multiple talkers and multiple listeners - Ethernet interconnection	EN IEC 61162-450	-
IEC 61162-460	2018	Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –Safety and security	EN IEC 61162-460	2018

IEC 63154

Edition 1.0 2021-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Maritime navigation and radiocommunication equipment and systems – Cybersecurity – General requirements, methods of testing and required test results

Matériels et systèmes de navigation et de radiocommunication maritimes – Sécurité informatique – Exigences générales, méthodes d'essai et résultats d'essai exigés

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 35.030; 47.020.70

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CYBERSECURITY – GENERAL 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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IEC 63154 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems. It is an International Standard.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
80/984/FDIS	80/989/RVD

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

The language used for the development of this International Standard is English

This document has been drafted in accordance with the ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IMO resolution MSC.428(98) on maritime cyber risk management in safety management systems affirms the need for cyber risk management on vessels subject to the SOLAS Convention. This document addresses the basic cybersecurity requirements for shipborne navigation and radiocommunication equipment falling within that need.

Shipborne navigation and radiocommunication equipment are generally installed in restricted areas, for example at the bridge where access is defined by the IMO International Ship and Port Facility Security (ISPS) Code or in an electronic locker room or in a closed cabinet. These restricted areas are referred to as secure areas in this document. This is based on the importance of navigation and radiocommunication equipment for the safety of navigation. These restricted areas are considered as areas with implemented security and access measures. These measures are defined in the ship security plan of the individual vessel derived from ISPS code, they are not part of this document and not specified or tested in the context of this document. Accordingly, equipment installed in these physically restricted access areas are understood to benefit from these security measures. This document provides mitigation against the remaining cyber vulnerabilities for equipment installed in such areas.

Following from the above, this document includes consideration of cyber threats from unauthorized users, from removable external data sources (REDS) like USB sticks, from network segments installed outside of the restricted areas including interfaces to external networks, for example ship to shore, ship to ship.

The risk of an incident is different for each equipment/system boundary, and the mitigating security measures required should be appropriate to the identified risk of incident and proportional to the identified adverse consequences. Boundaries take the form of both physical, such as direct access to the equipment via its ports (e.g. network, USB, import of digital files, software installation) and logical (e.g. connections over a network, transfer of data, operator use). A key tenet of cyber security is authentication of who has provided the data and verification that what is being provided has not been tampered with.

To reflect the difference in cyber security risk, the needs for authentication and verification between secure and non-secure areas are illustrated in Figure 1. The methods for achieving authentication and verification are described in each module of this document.

In Figure 1, the colour red means a source requiring authentication and verification. The colour green means a source not requiring authentication and verification.

The explanation of the numbers in Figure 1 is:

1) external communication that requires authentication and verification as the source is not a local secure area and its provenance cannot be trusted;
2) local network message interfacing that does not require authentication and verification as they are part of normal operation defined by configuration in a local secure area, for example VDR binary transfer, IEC 61162 interfacing, internal proprietary data exchange;
3) local message and data import between networks that does not require authentication and verification as they are part of normal operation defined by configuration in local secure areas;
4) external data import by an operator from an external source via REDS that requires authentication and verification of data import; this applies to executable or non-executable data;
5) local serial interface messaging that does not require authentication and verification as it is part of normal operation defined by configuration in a local secure area;
6) updates applied via external data source or REDS in maintenance mode that does not require authentication and verification but does require user authentication to change configuration.

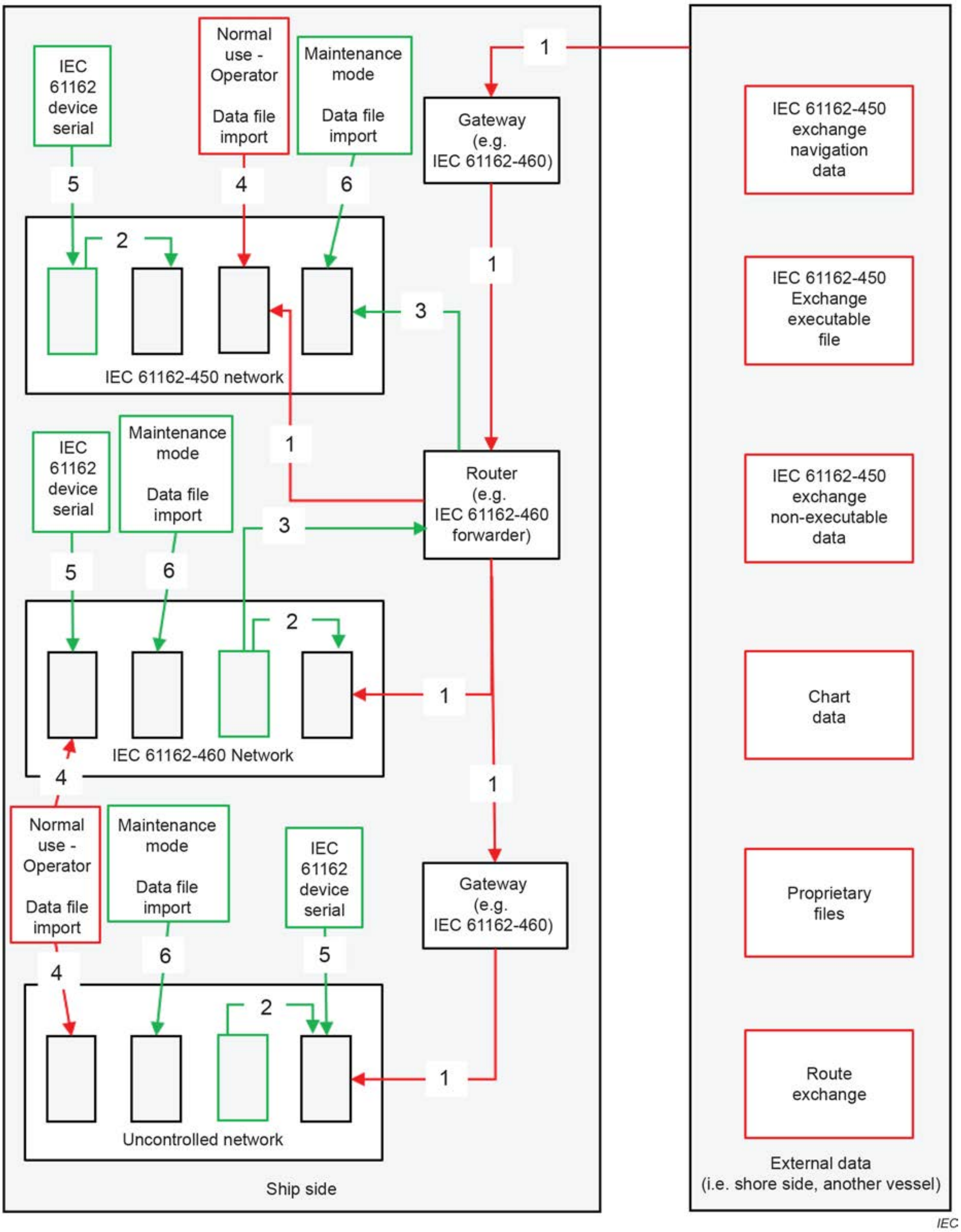
IEC 61162 device serial
Normal use - Operator Data file import
Maintenance mode Data file import
1
Gateway (e.g. IEC 61162-460)
5
4
6
2
1
3
IEC 61162-450 network
1
IEC 61162 device serial
Maintenance mode Data file import
Router (e.g. IEC 61162-460 forwarder)
3
5
6
2
1
IEC 61162-460 Network
4
1
Normal use - Operator Data file import
Maintenance mode Data file import
IEC 61162 device serial
Gateway (e.g. IEC 61162-460)
6
5
4
2
1
Uncontrolled network
Ship side
IEC 61162-450 exchange navigation data
IEC 61162-450 Exchange executable file
IEC 61162-450 exchange non-executable data
Chart data
Proprietary files
Route exchange
External data (i.e. shore side, another vessel)
IEC

Figure 1 – Some examples of data transfer

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CYBERSECURITY – GENERAL REQUIREMENTS, METHODS OF TESTING AND REQUIRED TEST RESULTS

1 Scope

This document specifies requirements, methods of testing and required test results where standards are needed to provide a basic level of protection against cyber incidents (i.e. malicious attempts, which actually or potentially result in adverse consequences to equipment, their networks or the information that they process, store or transmit) for:

a) shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) mentioned in the International Convention for Safety of Life at Sea (SOLAS) as amended, and by the Torremolinos International Convention for the Safety of Fishing Vessels as amended, and to other shipborne radio equipment, where appropriate;

b) shipborne navigational equipment mentioned in the International Convention for Safety of Life at Sea (SOLAS) as amended, and by the Torremolinos International Convention for the Safety of Fishing Vessels as amended,

c) other shipborne navigational aids, and Aids to Navigation (AtoN), where appropriate.

The document is organised as a series of modules dealing with different aspects. The document considers both normal operation of equipment and the maintenance of equipment. For each module, a statement is provided indicating whether the module applies during normal operation or in maintenance mode.

Communication initiated from navigation or radiocommunication equipment outside of items a), b) and c) above, for example ship side to other ship or shore side, are outside of the scope of this document.

This document does not address cyber-hygiene checks, for example anti-malware scanning, etc., performed outside of the cases defined in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

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

IEC 61162-460:2018, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –Safety and security*