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Electronic record books for ships — Technical specifications and operational requirements

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Foreword

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 11, *Intermodal and Short Sea Shipping*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document was developed in response to maritime industry demand and International Maritime Organization (IMO) request for a standard providing requirements for the design and testing of electronic record books on ships. The industry momentum towards paperless systems enhances the need of such a standard with technical and operational requirements for electronic record books.

Electronic record books for ships — Technical specifications and operational requirements

1 Scope

This document specifies the minimum technical and operational requirements for electronic record books (ELRB) to be used on ships.

It aims at providing manufacturers, operators, maritime administrations and owners with a technical background for the replacement of paper logbooks.

2 Normative references

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

IEC 61162-1:2016, *Single talker and multiple listeners*

IEC 61162-2:2016, *Single talker and multiple listeners, high-speed transmission*

IEC 61162-450, *Multiple talkers and multiple listeners — Ethernet interconnection*

IEC 61162-460, *Multiple talkers and multiple listeners — Ethernet interconnection — Safety and Security*

IEC 62923:2018, *Maritime navigation and radiocommunication equipment and systems — Bridge alert management*

IMO Resolution MSC 302(87), *Adoption of performance standards for Bridge Alert Management*

IMO Resolution MSC 333(90), *Adoption of revised performance standards for shipborne voyage data recorders (VDRs)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
administration
government of the State under whose authority the ship is operating

Note 1 to entry: With respect to fixed or floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the administration is the government of the coastal State concerned.

3.2
analytical evaluation
detailed examination of the presentation of information to confirm that a particular condition has been met

Note 1 to entry: Analytical evaluations can be made by a relevant expert with the necessary education, skills and/or experience to make an informed and reliable judgement concerning the presentation of information, its appropriateness, and usability. It is used for the evaluation of properties which can be judged only in the context of other information or knowledge which requires the tester presentation. Compliance is determined by comparing the observed property to the requirement.

3.3
audit logging
logs recording user activities, exceptions, and information security events, where logs are kept for an agreed period to assist in future investigations and access control monitoring

3.4
authorized person
operator with enough clearance to handle an *electronic record book (ELRB)* (3.12) appointed by the ships master

Note 1 to entry: Each authorized person is registered on the *electronic approval system* (3.11), and the authorized person is controlled by the personal name or another personal identification data such as the passport number.

3.5
automatic record
data input generated by any other electronic device integrated to the *electronic record book (ELRB)* (3.12)

3.6
back-up
means to make a duplicate copy of a file, program, etc. as a safeguard against loss or corruption of the original

3.7 data

3.7.1
automatically collected data
data that has been collected and stored by automatic means but has not been approved by a human user

3.7.2
edit history data
history of changes in one record, including the editor, edited content and time and date of the edit

3.7.3
record book data
data entered manually by an authenticated user, or if based on *automatically collected data* (3.7.1) after an authenticated user has verified it

Note 1 to entry: This data must be included in all output, backups, sending to VDR, etc.

3.7.4
signed record book data
data which is closed from editing after having been signed by the master

3.8
bridge
area from which the navigation and control of the ship is exercised, including the wheelhouse and bridge wings

[SOURCE: ISO 8468:2007, 3.1.7]

3.9
bridge configuration
shape of the *bridge* (3.8), comprising the outer bulkheads and windows of the bridge area

[SOURCE: ISO 8468:2007, 3.1.9]

3.10
display
means by which a device presents visual information to the operator, including conventional instrumentation

[SOURCE: ISO 8468:2007, 3.1.20]

3.11
electronic approval system
system which identifies the person by using ID and password or biometrics authentication or an equivalent system such as that recommended in ISO 7498-2 that could ensure a unique private profile for every user

3.12
electronic record book
ELRB
device or system used to electronically record or store events that occur on board such as the state of the ship and its equipment

Note 1 to entry: SOLAS Chapter V Regulation 28 and IMO resolution A.916(22) specify provisions in relation with records of navigational activities and entries for discharge, transfers and other operations as required under MARPOL annexes.

3.13
ergonomics
study and design of working environments and their components, work practices, and work procedures for the benefit of the worker's productivity, health, comfort and safety

[SOURCE: ISO 8468:2007, 3.1.25]

3.14
functional unit
entity of hardware, software, or both, capable of accomplishing a specified purpose

[SOURCE: ISO/IEC 2382:2015, 2121310, modified — Notes 1 and 2 to entry were deleted.]

3.15
guideline
non-mandatory information leading to a compliant solution for the related requirement

[SOURCE: ISO 8468:2007, 3.1.29]

3.16
manual input
data input generated by the intervention of a human

3.17
master
ship's captain and the person in overall charge of the ship

Note 1 to entry: Information recorded and stored in the *electronic record book (ELRB)* (3.12) is taken as an official record from which the master is held responsible.

[SOURCE: ISO 8468:2007, 3.1.35, modified — Note 1 to entry has been added.]

3.18
navigation
process of position-finding as well as planning, controlling and recording the movement of a ship from one place to another

[SOURCE: ISO 8468:2007, 3.1.38]

3.19
official record evidence
information considered as real and being legally recognized as a faithful statement of fact

3.20
paper logbook
hard copy book approved by an *administration* (3.1) where a ship is registered, where records of operations, maintenance, safety, security, environmental protection measures and training are permanently saved as required by the administration

3.21
removable external data source
REDS
user removable non-network data source, including, but not limited to compact discs, memory sticks, and Bluetooth devices

Note 1 to entry: Bluetooth is the trademark of a product supplied by Bluetooth Special Interest Group 91.

[SOURCE: IEC 61162-460]

3.22
Role Based Access Control
RBAC
access privileges that are assigned to specific roles

Note 1 to entry: Access users acquire privileges through their assigned role.

Note 2 to entry: Adapted from ISO 16484-5:2017, 3.2.

3.23
server
functional unit that provides services to workstations, personal computers or other functional units in a computer network

3.24
storage
functional unit into which data can be placed, in which they can be retained, and from which they can be retrieved

[SOURCE: ISO/IEC 2382:2015, 2121280 modified – The preferred term, storage device, and the Notes to entry have been deleted.]

3.25
update
immediate or planned activity to update the *electronic record book (ELRB)* (3.12) used onboard a vessel to ensure that the ELRB remains compliant with the most recent international conventions

4 System requirements

4.1 General requirements

The ELRB shall allow storage of events such as the state of the ship either by means of manual or automatic input. The automatic input may be based on connection to other equipment on board. The

implementation of ELRBs is highly encouraged as it offers improvement in the reliability of recording of events, offers improved redundancy in the storage of required records and reduces seafarer´s workload.

Information recorded and stored in the ELRB is taken as an official record and is equivalent to the information recorded to a paper logbook as admissible evidence. An automatic record is recognized as official if it has been approved by an authorized person.

When the information is recorded and stored by both means of ELRB and paper logbook, the administration judges which takes precedence.

If the ELRB is unable to record and store the events and states due to a malfunction they shall be recorded in an official paper logbook.

The ELRB shall comply with IEC 60945 regarding environmental requirements for electromagnetic compatibility (EMC).

4.1.1 Power supply

It shall be possible to supply the ELRB with electrical power from both main and emergency power supply. The ELRB shall be capable of automatically switching the power supply between the main and emergency.

The recorded and stored data shall be protected from damage when electronic power supply from main power supply and/or emergency power supply to ELRB is lost.

4.2 Functional requirements

4.2.1 Data storage

The information recorded and stored in the ELRB shall be the same as those of the paper logbooks. The information shall be recorded and stored with Coordinated Universal Time (UTC) and the location (latitude and longitude) from approved source.

All time information recorded by the ELRB shall be referred to UTC.

Therefore, the internal ELRB clock shall be synchronized with time from the UTC source (e.g. GPS).

When the time from UTC source is not available, the time of the internal ELRB clock shall be used and ELRB shall clearly indicate loss of synchronization to UTC, and also display which time source is in use.

ELRB recorded and stored data shall at least be written in the English language.

All information shall be presented by the ELRB in a clear and legible font.

The recorded and stored data shall be categorized into the following four types and each of them shall be recorded in chronological order:

— automatically collected data;

— record book data;

— signed record book data;

— edit history data.

The approved source to ELRB should be approved by the IMO.

4.2.1.1 Tampering avoidance

The data recorded and stored in the ELRB are considered as official records and shall be protected against tampering.

