
**Ships and marine technology —
Systems for the detection of persons
while going overboard from ships
(man overboard detection)**

*Navires et technologie maritime — Systèmes pour la détection des
personnes passant par-dessus bord (détection d'un homme à la mer)*

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	3
5 Requirements	3
5.1 General.....	3
5.2 Principle of operation.....	3
5.3 System description.....	4
5.4 Control station.....	4
5.5 Design and testing.....	4
5.5.1 General.....	4
5.5.2 Light emitting system components.....	4
5.5.3 Noise emitting system components.....	5
5.5.4 Power.....	5
5.5.5 Electromagnetic compatibility.....	5
5.5.6 Ingress protection.....	5
5.5.7 Environmental vibration.....	5
5.5.8 Thermal performance.....	5
5.6 MOB detection.....	5
5.7 MOB detection zone.....	5
5.8 MOB indication initiators.....	6
5.9 Visual indication.....	6
5.10 Audible indication.....	6
5.11 MOB verification data.....	6
5.12 MOB Event actions.....	6
5.13 MOB event message.....	7
5.14 MOB event log.....	7
5.15 Operational status.....	7
5.16 Captured data.....	8
5.17 Date and time stamps.....	8
5.18 Data storage.....	8
5.19 User account types.....	8
5.20 Access controls.....	9
5.21 Anti-tamper protection.....	9
5.22 Security log.....	9
5.23 Compliance with appropriate IMO resolutions.....	9
5.24 MOB testing manikin.....	9
6 Controlled environment performance requirements	10
6.1 General.....	10
6.2 Basic probability of detection.....	10
7 Shipboard-based performance requirements	11
7.1 General.....	11
7.2 Probability of detection.....	11
7.3 False alarm rate.....	13
7.4 Standby mode.....	13
Annex A (informative) Recommendations	14
Bibliography	15

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Maritime safety*.

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

The lack of standardized man overboard (MOB) detection system requirements has made it difficult for end users to objectively evaluate the safety and effectiveness of such systems. This document addresses these issues by clearly defining the technical specifications for the equipment, thereby allowing manufacturers to develop systems against a common set of requirements and enabling end-users to evaluate the safety, effectiveness, performance and reliability of MOB detection systems.

This document provides a method to verify that a system operates to the required performance in a specified environmental window ([Table 1](#)) and against a manikin of the size described in [5.24](#). Systems that are operational outside the prescribed environmental conditions or used to detect people that do not conform to the effective manikin size can suffer some degradation in performance. It is not currently possible to quantify that degradation.

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Ships and marine technology — Systems for the detection of persons while going overboard from ships (man overboard detection)

1 Scope

This document specifies technical requirements for systems designed to detect a person who has gone overboard from a ship.

This document does not cover man overboard (MOB) detection systems that require the passengers or crew to wear or carry a device to trigger an MOB event.

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 (all parts), *Maritime navigation and radiocommunication equipment and systems — Digital interfaces*

IMO Resolution A., 1021(26), *Code on alerts and indicators, 2009*
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IMO Resolution MSC., 302(87), *Bridge alert management*

IMO Resolution MSC, 337(91), *Adoption Of The Code On Noise Levels On Board Ships*

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 <https://www.electropedia.org/>

3.1

accessible open area

area of the ship accessible to either passengers or crew and open to the outside, where a person who fell would end up overboard

3.2

active state

state in which the system is on

3.3

alarm action

action available within the system when a MOB alert or alarm is triggered or changes status

**3.4
control station**

equipment that provides the facilities for human observation and control of the MOB detection system

**3.5
data**

information captured and/or generated by the MOB detection system

Note 1 to entry: Data can be in either a raw or a processed form and includes basic (e.g. text, numeric, Boolean), composite (e.g. array, class, and list) and multimedia (e.g. images, audio, and video) data types.

**3.6
environmental vibration**

periodic motion of equipment installed aboard ships as a result of environmental forces

**3.7
false alarm**

system activation not caused by an actual MOB event

**3.8
heading**

angle between the direction in which the ship's bow is pointing and a reference direction, e.g. true north, expressed in degrees, usually from 000° clockwise through 360°

**3.9
laboratory**

body that performs one or more of the following activities:

- testing
- calibration
- sampling associated with subsequent testing or calibration

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[SOURCE: ISO/IEC 17025:2017, 3.6, modified — Note 1 to entry has been omitted.]

**3.10
man overboard event**

MOB event

incident in which person(s) has accidentally or intentionally gone over the side/front/back of a ship and into the water

**3.11
man overboard verification data**

MOB verification data

system *data* (3.5) that may be used by user to acknowledge, deny, confirm or terminate a MOB alert or alarm at the *control station* (3.4)

**3.12
nominal operating conditions**

set of ship and environmental conditions

Note 1 to entry: See [Table 1](#).

Table 1 — Nominal operating conditions

Condition	Value
Wave height	0 m to 2,5 m
Precipitation	None
Ship speed over ground	0 knots to 25 knots

3.13**sensor unit**

device or system of devices that detects and responds to one or more physical stimuli

3.14**underway**

not at anchor, made fast to the shore, or aground

4 Abbreviated terms

ECDIS electronic chart display and information system

MOB man overboard

RAID redundant array of independent disks

S-VDR simplified voyage data recorder

VDR voyage data recorder

5 Requirements**5.1 General**

The testing outlined in this document shall be conducted by a laboratory meeting the requirements of ISO 17025 or may be conducted by the manufacturer, provided the tests conducted by the manufacturer are approved by a laboratory meeting the requirements of ISO 17025 or classification society that complies with the applicable unified interpretations and requirements posted by the International Association of Classification Societies (IACS) or other recognized organization.

NOTE IACS is an organization that establishes, reviews, promotes and develops minimum technical requirements in relation to the design, construction, maintenance and survey of ships and other marine related facilities. It also assists international regulatory bodies and standards organizations to develop, implement and interpret statutory regulations and industry standards in ship design, construction and maintenance, with a view to improving safety at sea and the prevention of marine pollution.

The intent of the following requirements is to measure the system level of performance in the intended, nominal operational environment.

[Annex A](#) provides additional recommendations for guidance to those developing, installing, testing and using MOB detection systems.

5.2 Principle of operation

An MOB system shall operate in accordance with the principles described in this subclause.

The MOB system sensors shall detect persons and other objects passing through the detection zone (see [5.7](#)). Processing or analysis of the raw data may be conducted in the sensor(s), a server, the control station or any combination of the three.

Once the analysis is complete, the system shall have automatically excluded any event that is not a man overboard event (plus allowable rate of false alarms). For each event that passes the threshold for an MOB event, the system shall generate an indication. A human operator shall be required to review the event and determine if the event is a man overboard event or a false alarm.

False alarms shall be recorded in the system with a comment from the operator on the cause. This will be used to further develop understanding of the behaviour of such systems during normal operations and varied environmental conditions.

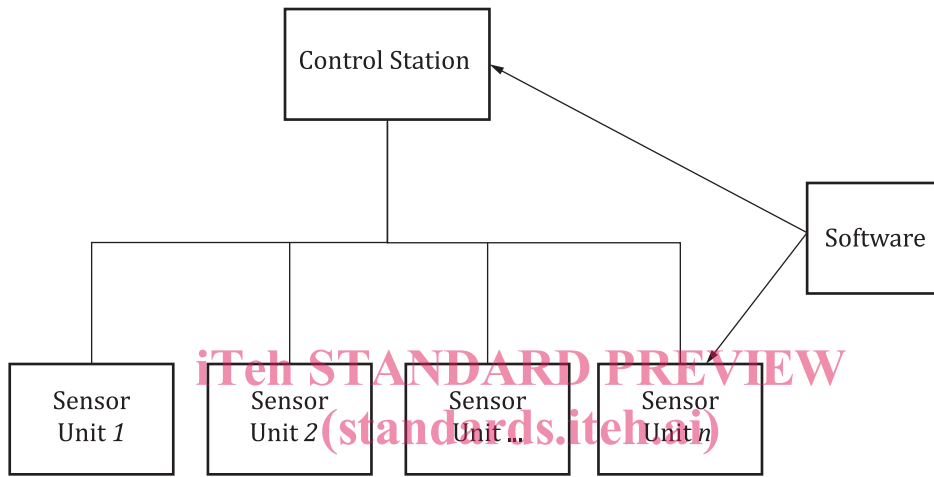
Man overboard events shall remain active on the control station until marked complete by a human operator with comments on outcome.

The MOB system shall be designed with the possibility to connect to integrated navigation systems (ECDIS) to display geospatially referenced MOB event markers.

The MOB system shall be designed with input interfaces for time, position and available environmental data.

5.3 System description

A general MOB detection system described in this document consists of a control station, sensor units, cables and associated software (Figure 1).



NOTE Depending on the system, the associated software can be installed on the control station and/or sensor units.

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Figure 1 — Block diagram of a general MOB detection system with logical links

5.4 Control station

The system shall include a control station where alarms and data can be reviewed.

The system shall have the capability for an operator to manually select an imaging sensor and timeline for playback at the control station.

5.5 Design and testing

5.5.1 General

The MOB system shall be designed and tested to comply with the requirements of IEC 60945 for protected or exposed components as appropriate for each system sub-assembly.

Specific requirements described in 5.5.2 to 5.5.8.

5.5.2 Light emitting system components

The intensity of light emitting system components located or installed in the bridge area shall be fully dimmable and capable of being controlled at the control station.

5.5.3 Noise emitting system components

All parts of the system that is installed in the navigating bridge and/or chartrooms shall have a combined noise level of less than 60dB(A) at a distance of 1 m from any part of the equipment under test (EUT), as defined in IEC 60945:2002, 11.1. The MOB audible alarm is exempt from this requirement.

System components installed in locations other than the navigating bridge or chartroom shall follow the maximum noise levels set forth by IMO Resolution MSC.337(91) The MOB audible alarm is exempt from this requirement.

5.5.4 Power

The equipment shall be compatible with ship's power as specified and tested in accordance with IEC 60945 for nominal AC power input between 100 Vrms and 230 Vrms.

5.5.5 Electromagnetic compatibility

The system shall satisfy the requirements for electromagnetic emission and immunity to electromagnetic environments set forth in IEC 60945.

5.5.6 Ingress protection

All components of the system that are required to be installed in an area of the ship that is open to the elements shall be certified to an ingress protection rating of IPx6 or greater. Testing shall be conducted in line with procedures in IEC 60945.

5.5.7 Environmental vibration (standards.iteh.ai)

The system shall be capable of withstanding typical environmental vibrations that can be encountered on the ship. The system shall be tested in accordance with IEC 60945 to determine this capability.

5.5.8 Thermal performance

The system shall be certified as having been tested against the thermal requirements of IEC 60945 as applicable to each component.

5.6 MOB detection

The system shall detect persons that pass through the MOB detection zone (see 5.7) while going overboard.

The method of detection shall not require the passengers or crew to wear or carry a device to trigger an MOB event.

At a minimum, the system shall be capable of detecting a human with a height greater than 1,466 m. This height is based on the minimum 5th percentile stature data published in ISO/TR 7250-2.

5.7 MOB detection zone

The MOB detection zone shall be designed to:

- a) cover the entire periphery of the ship;
- b) be located at or below the lowest accessible open area; and
- c) extend a minimum of 8 m from the periphery of the ship.