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Ships and marine technology — Marine evacuation systems — Means of communication

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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 27991 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

Introduction

This International Standard is intended to provide guidelines on how to ensure safe communication and aid the control of an evacuation between the embarkation station and the platform or survival craft on ships fitted with marine evacuation systems (MES) as required by the International Convention for the Safety of Life at Sea (SOLAS). Considering the importance of the availability of uniform and clearly perceptible means of communication, this International Standard is intended to define and specify acceptable means of communication in conjunction with the operation of MES in order to ensure safe and rapid evacuation of ships fitted with MES.

Ships and marine technology — Marine evacuation systems — Means of communication

1 Scope

This International Standard specifies means of communication between an MES embarkation station and the platform or survival craft secured to the end of system passage as required by SOLAS regulation III/6.4.4.

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 60529, *Degrees of protection provided by enclosures (IP code)*

3 Terms and definitions

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

3.1
communication
means of passing essential information between the relevant persons assigned to operate the MES

3.2
controller
person in charge overall at the embarkation station

3.3
marine evacuation system
MES
appliance for the rapid transfer of persons from the embarkation deck of a ship to a floating survival craft

3.4
passage
portion of the MES that provides the means of transfer of persons between the embarkation station and the platform or survival craft

3.5
platform
floating platform which may be fitted at the bottom of the passage to hold evacuees awaiting entry to survival craft

3.6
receiver
person normally located at the exit of the passage to assist the persons exiting the passage and direct them into survival craft

3.7
survival craft
craft capable of sustaining the lives of persons in distress from the time of abandoning the ship

4 General

4.1 General principles

4.1.1 The means of communication shall facilitate the safe command and control of an MES evacuation. All means of communication shall be simple and clear, easily understood, and unambiguous.

4.1.2 The communication would normally be between the entrances and exits of the MES passage, where normally there would be positioned a controller and receiver(s), respectively. The messages requiring communication are as shown in Table 1, and are applicable to all MES, no matter what height or configuration (slide/chute/other). These support safe and controlled evacuation, and are the critical points of feedback during an evacuation.

Table 1 — Messages requiring communication

CONTROLLER side	RECEIVER side
Starting evacuation [a]	Ready to receive [a]
Stopping evacuation [a]	Stop evacuation [a]
Change pace of evacuation	Change pace of evacuation
Identify an incident has occurred	Identify an incident has occurred

[a] In the event of failure of the communications system, alternative means of communicating the indicated messages shall be clearly defined in the MES operating manual or in the vessel training manual.

4.1.3 All messages applicable to each MES shall be clearly defined in the MES operating manual.

4.1.4 For an MES where the persons descending the system are visible to the controller and receiver along the complete length of the passage, and the controller and receiver are in clear sight of each other, it is sufficient to have only a visual form of communication, as feedback regarding how the evacuation is progressing can be observed by all the relevant personnel.

4.1.5 For an MES that does not conform with 4.1.4, a communication system shall provide the controller with an audible or visual indication of the status of the person(s) descending the passage.

4.2 Means of communication

The means of communication may be visual or audible. Examples of such means of communication are listed below.

a) Visual:

- light signals, typically LED or lamps;
- hand signals.

b) Audible:

- verbal (i.e. unamplified voice);
- radio based;
- klaxon/horn/whistle/bullhorn.

5 Performance requirements

5.1 General

5.1.1 The means of communication shall be ergonomically positioned, and shall not interfere with the operation of other life-saving appliances on the ship, particularly those adjacent to the equipment.

5.1.2 All means of communication shall be capable of functioning correctly for the duration of an evacuation.

5.1.3 The performance of the means of communication shall take into account

— background noise and vibration,

— lighting – artificial and strong, natural sunlight, as well as nighttime operation and backlighting,

— conditions of restricted or reduced visibility,

— environmental conditions [–30 °C to +65 °C, humidity, visibility (e.g. controller viewing receiver in snow storm), heavy weather (e.g. Beaufort 6)],

— robustness to withstand the conditions and forces generated during a deployment and evacuation, and

— possible confusion between individual MES communication systems as well as shipboard operational, emergency and damage control communications.

5.1.4 The exact meaning of each signal shall be defined clearly in the MES operating manual and/or be in compliance with the vessel's training manual.

5.2 Visual signals

5.2.1 General

The visual signals shall communicate clearly the relevant command and control information to the correct personnel.

5.2.2 Light signals

5.2.2.1 If red and green light signals are used, they should comply with the following internationally recognised format:

Red stop/danger

Green go/safe

5.2.2.2 All light based means of communication shall be positioned local to the relevant operator, within their line of sight.

5.2.2.3 Circuitry and other components associated with the operation of light signals shall be positioned so as not to interfere with the evacuation of persons through the MES passage, and should be suitably sealed with respect to its positioning, typically a minimum IP55 for deck positioned equipment, and a minimum of IP66 for equipment used at the waterline, determined in accordance with IEC 60529.

5.2.2.4 Lights shall be clearly visible under daylight conditions when fitted in their normal operating position.

5.2.2.5 It shall be demonstrated that the power source for light signals is capable of powering them for a duration as determined in accordance with 5.1.2 with sufficient intensity to comply with 5.2.2.4.

5.2.3 Hand signals

Hand signals may be used where there is normally a clear, continuous line of sight between the relevant persons assigned to operate the MES.

5.2.4 Others

Other visual signals may be used, provided that they are demonstrated to provide equivalent performance to those specified above, and comply with the same requirements of position, visibility and definition.

5.3 Audible communication

5.3.1 General

All audible communication shall take into account the distance between the two relevant persons, how much information is to be transferred, and likely environmental conditions.

5.3.2 Verbal (unamplified voice)

This means of communication may be used as conditions permit but shall not be the sole means of communication.

5.3.3 Radio based

Radio based systems may be used to meet this requirement.

5.3.4 Klaxon/horn/whistle/bullhorn

Klaxons/horns/whistles/bullhorn shall be easily heard and distinguishable at the working position of the relevant personnel.

5.3.5 Others

Other audible signalling means may be used provided they effectively and efficiently provide communication between the relevant personnel in all operating conditions.

6 Testing

6.1 Where applicable it shall be demonstrated by means of a deployment of the complete MES that each means of communication system or sub-assembly thereof is capable of being deployed and operated safely and correctly, and is sufficiently robust to withstand normal in service, deployment and evacuation conditions.

6.2 It shall be demonstrated that in bright, clear daytime and nighttime conditions, the communications signals can be clearly interpreted taking the performance requirements in 5.1.3 into account.

6.3 It shall be demonstrated during a trial evacuation with persons passing through the passage that the signals can be clearly interpreted.

6.4 The means of communication shall be demonstrated to be effective in a sea state associated with a wind of force of Beaufort 6 and in association with a significant wave height of at least 3 m.

6.5 Compliance with 6.1 to 6.4 may be demonstrated during approval testing of the MES or during another suitable operational deployment.

Bibliography

[1] IMO *International Code of Safety for High-Speed Craft* (1994 and 2000 as amended)

[2] IMO *International Life-Saving Appliance (LSA) Code* [Res. MSC.48(66)]

[3] IMO *Recommendation on testing of life-saving appliances* [Res. A.689(17), as amended through Res. MSC.81(70)]

[4] *International Convention for the Safety of Life at Sea (SOLAS)*, 1974 [as amended through Res. MSC.47(66)]

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