

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Maritime navigation and radiocommunication equipment and systems – Bridge navigational watch alarm system (BNWAS)

Équipements et systèmes de navigation et de radiocommunication maritimes – Système d’alarme pour la surveillance de l’activité de navigation sur le pont

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND
RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –
BRIDGE NAVIGATIONAL WATCH ALARM SYSTEM (BNWAS)**

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International Standard IEC 62616 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This bilingual version (2014-12) corresponds to the English version, published in 2010-02.

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

| | |
|-------------|------------------|
| FDIS | Report on voting |
| 80/577/FDIS | 80/588/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – BRIDGE NAVIGATIONAL WATCH ALARM SYSTEM (BNWAS)

1 Scope

This International Standard specifies the minimum performance requirements, technical characteristics and methods of testing, and required test results, for a bridge navigational watch alarm system (BNWAS) as required by Chapter V of the International Convention for the Safety of Life at Sea (SOLAS), as amended. It takes account of the general requirements given in IMO resolution A.694(17) and is associated with IEC 60945. When a requirement in this International Standard is different from IEC 60945, the requirement in this standard takes precedence.

This standard incorporates the parts of the performance standards included in IMO resolution MSC.128(75).

NOTE 1 All text of this standard, whose wording is identical to that of IMO resolution MSC.128(75), is printed in italics, and the resolution and associated performance standard paragraph numbers are indicated in brackets.

(128/A1) The purpose of a bridge navigational watch alarm system (BNWAS) is to monitor bridge activity and detect operator disability which could lead to marine accidents. The system monitors the awareness of the Officer of the Watch (OOW) and automatically alerts the Master or another qualified OOW if for any reason the OOW becomes incapable of performing the OOW's duties. This purpose is achieved by a series of indications and alarms to alert first the OOW and, if he is not responding, then to alert the Master or another qualified OOW. Additionally, the BNWAS may provide the OOW with a means of calling for immediate assistance, if required. The BNWAS should be operational whenever the ship is underway at sea (SOLAS V/19.2.2.3).

NOTE 2 BNWAS may not, in practice, be realised as a stand alone equipment. It may be integrated in other equipment such as radar, ECDIS, etc.

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

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

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

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

IMO Resolution A.813(19), *General requirements for electromagnetic compatibility (EMC) for all electrical and electronic ship's equipment*

IMO Resolution A.830(19), *Code on alarms and indicators*

IMO Resolution MSC.128(75), *Recommendation on performance standards for a bridge navigational watch alarm system (BNWAS)*

IMO MSC/Circ.982, *Guidelines on Ergonomic Criteria for Bridge equipment and Layout*

3 Performance requirements

3.1 Functionality

3.1.1 Operational modes

(See 7.4.1)

(128/A4.1.1.1) *The BNWAS shall incorporate the following operational modes:*

- *Automatic (Automatically brought into operation whenever the ship's heading or track control system is activated and inhibited when this system is not activated)*
- *Manual ON (In operation constantly)*
- *Manual OFF (Does not operate under any circumstances)*

NOTE The Automatic mode is not suitable for use on a ship conforming with regulation SOLAS V/19.2.2.3 which requires the BNWAS to be in operation whenever the ship is underway at sea.

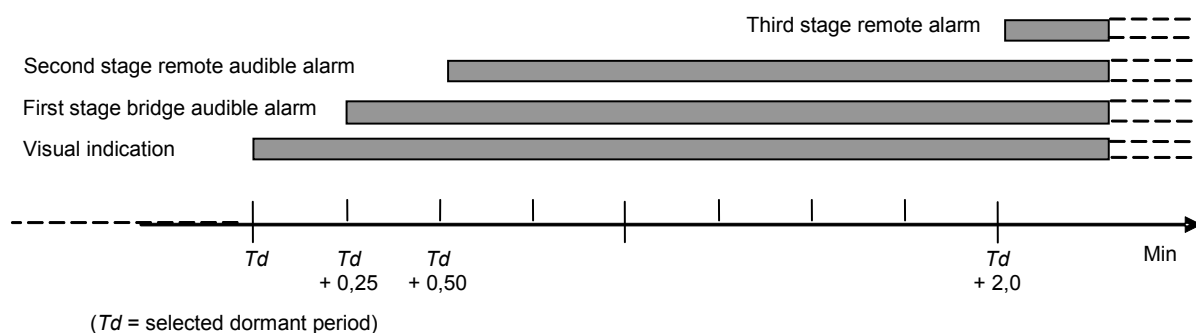
3.1.2 Operational sequence of indications and alarms

3.1.2.1 Dormant period

(See 7.4.2)

(128/A4.1.2.1) *Once operational, the alarm system shall remain dormant for a period of between 3 and 12 min (T_d). See Figure 1.*

(128/A4.1.2.2) *At the end of this dormant period, the alarm system shall initiate a visual indication on the bridge.*



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Figure 1 – Alarm sequence without acknowledgements

3.1.2.2 First stage bridge audible alarm

(See 7.4.3)

(128/A4.1.2.3) *If not reset, the BNWAS shall additionally sound a first stage audible alarm on the bridge 15 s after the visual indication is initiated.*

3.1.2.3 Second stage remote audible alarm

(See 7.4.3)

(128/A4.1.2.4) *If not reset, the BNWAS shall additionally sound a second stage remote audible alarm in the back-up officer's and/or Master's location 15 s after the first stage audible alarm is initiated.*

3.1.2.4 Third stage remote audible alarm

(See 7.4.3)

(128/A4.1.2.5) *If not reset, the BNWAS shall additionally sound a third stage remote audible alarm at the locations of further crew members capable of taking corrective actions 90 s after the second stage remote audible alarm is initiated.*

3.1.2.5 Alarm alternatives

(See 7.4.4)

(128/A4.1.2.6) *In vessels other than passenger vessels, the second or third stage remote audible alarms may sound in all the above locations at the same time. If the second stage audible alarm is sounded in this way, the third stage alarm may be omitted.*

(128/A4.1.2.7) *In larger vessels, the delay between the second and third stage alarms may be set to a longer value on installation, up to a maximum of 3 min, to allow sufficient time for the back-up officer and/or Master to reach the bridge.*

Installation set-up facilities shall be provided to inhibit the third stage alarm and to increase the delay between the second and third stage alarms to 3 min.

3.1.3 Reset function

3.1.3.1 Description of reset function

(See 7.4.5)

(128/A4.1.3.2) *The reset function shall, by a single operator action, cancel the visual indication and all audible alarms and initiate a further dormant period. If the reset function is activated before the end of the dormant period, the period shall be re-initiated to run for its full duration from the time of the reset.*

Single operator action is defined as activating a hard-key or soft-key including any necessary cursor movement.

3.1.3.2 Initiation of reset function

(See 7.4.6)

(128/A4.1.3.3) *To initiate the reset function, an input representing a single operator action by the OOW is required. This input may be generated by reset devices forming an integral part of the BNWAS or by external inputs from other equipment capable of registering physical activity and mental alertness of the OOW.*

For the purposes of this standard, mental alertness means consciously intended operations or movements for which there is no risk of automatic generation by vibration or by movement of the ship.

NOTE The IMO subcommittee on the safety of navigation at its 55th session (NAV 55/21) described three methods for the reset function as follows:

- 1) by a single operator action from a device forming an integral part of the BNWAS, for example a manually operated button or a touch screen; or
- 2) by external inputs from other equipment registering physical activity, for example sensors preferably detecting the presence and movements of a human body or floor pressure pads detecting movement of a human; or
- 3) by external inputs from other equipment registering mental alertness of the OOW, for example speech recognition sensors or changes in the operation of the manual controls of bridge equipment.

3.1.3.3 Continuous activation

(See 7.4.7)

(128/A4.1.3.4) *A continuous activation of any reset device shall not prolong the dormant period or cause a suppression of the sequence of indications and alarms.*

3.1.4 Emergency call facility and transfer of alarms

(See 7.4.8)

(128/A4.1.4) *Means may be provided on the bridge to immediately activate the second, and subsequently third, stage remote audible alarms by means of an "Emergency Call" push button or similar.*

Installation set-up facilities shall be provided for an "Emergency Call" system.

Facilities shall also be provided to immediately actuate the "Emergency Call" system from other equipment capable of transferring an unacknowledged alarm by contact closure or equivalent circuit, or an IEC 61162 interface using the ALR sentence.

NOTE Examples of equipment which are capable of transferring alarms include Integrated Navigation Systems and Track Control Systems.

IMO Resolution MSC.252(83), paragraph 20.5.1 states: *After a time defined by the user unless otherwise specified by IMO, an unacknowledged alarm should be transferred to the bridge navigational watch alarm system (BNWAS), if available. The unacknowledged alarm should remain visible and audible.*

IMO Resolution MSC.74(69) annex 2, paragraph 5.3.4 states: *In the case of any failure or alarm status received from the position-fixing sensor, the heading sensor or the speed sensor in use: 1) an alarm should be generated at the track control system; 2) the system should automatically provide guidance to the user of a safe steering mode; and 3) a back-up navigator alarm should be given if a failure or alarm status is not acknowledged by the officer of the watch (user) within 30 s.*

3.2 Accuracy

(See 7.4.9)

(128/A4.2) *The alarm system shall be capable of achieving the timings stated in 3.1.2 with an accuracy of 5 % or 5 s, whichever is less, under all environmental conditions.*

3.3 Security

(See 7.4.10)

(128/A4.3) *The means of selecting the Operational Mode and the duration of the Dormant Period (Td) shall be security protected so that access to these controls should be restricted to the Master only.*

3.4 Malfunctions, alarms and indications

(See 7.4.11)

(128/A4.4.1) *If a malfunction of, or power supply failure to, the BNWAS is detected, this shall be indicated. Means shall be provided to allow the repeat of this indication on a central alarm panel if fitted.*

NOTE See also 5.3 where there is a requirement for this indication to be powered from a battery maintained supply.

4 Ergonomic criteria requirements

4.1 Operational controls

(See 7.4.12)

The following controls are required:

- a) (128/A5.1.1) *A protected means of selecting the operational mode of the BNWAS.*
- b) (128/A5.1.2) *A protected means of selecting the duration of the dormant period of the BNWAS.*
- c) (128/A5.1.3) *A means of activating the "Emergency Call" function if this facility is incorporated within the BNWAS.*

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4.2 Presentation of information

4.2.1 Operational mode

(See 7.4.13)

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(128/A5.2.1) *The operational mode of the equipment shall be indicated to the OOW.*

4.2.2 Visual indications

(See 7.4.14)

(128/A5.2.2, see also Annex A) *The visual indication initiated at the end of the dormant period shall take the form of a flashing indication. The colour of the indication(s) shall be chosen so as not to impair night vision and dimming facilities (although not to extinction) shall be incorporated.*

4.2.3 First stage bridge audible alarm

(See 7.4.15)

(128/A5.2.3, see also Annex A) *The first stage audible alarm which sounds on the bridge at the end of the visual indication period shall have its own characteristic tone or modulation intended to alert, but not to startle, the OOW. This function may be engineered using one or more sounding devices. Tone/modulation characteristics and volume level shall be selectable during commissioning of the system.*

4.2.4 Second and third stage remote audible alarm

(See 7.4.16)

(128/A5.2.4) *The remote audible alarm which sounds in the locations of the Master, officers and further crew members capable of taking corrective action at the end of the bridge audible alarm period shall be easily identifiable by its sound and should indicate urgency. The volume of this alarm shall be sufficient for it to be heard throughout the locations above and to wake sleeping persons as described in IMO resolution A.830(19).*