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NATIONAL TECHNICAL REGULATION ON ALERTS AND INDICATIONS ON SHIPS

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CONTENTS

NATIONAL TECHNICAL REGULATION ON ALERTS AND INDICATIONS ON SHIPS

I GENERAL

1.1 Application and Scope

1.1.1 Application

1 This national technical regulation (hereinafter referred to as “the Regulation”) applies to the alert and indication systems on sea-going ships (hereinafter referred to as “ships”) surveyed and classed by Vietnam Register.

2 This Regulation provides the uniformity of priorities, aggregation, grouping, locations and types, including colours, symbols, etc., of shipboard alerts and indicators.

1.1.2 Scope

The present Regulation is to apply to organizations and individuals involving activities relating to the systems falling under the application as specified in 1.1.1 above, including Vietnam Register (hereinafter referred to as "VR"); ship owners; ship designers, builders, renovating and repairing yards, ship operators; one who designs, manufactures and installs alerts and indications onboard sea-going ships.

1.2 References and explanations

1.2.1 References in the Regulation

1 QCVN 21: 2015/BGTVT: National Technical Regulation on the classification and construction of sea-going steel ships.

2 QCVN 54: 2015/BGTVT: National Technical Regulation on the classification and construction of sea-going high speed craft.

3 QCVN 42: 2015/BGTVT: National Technical Regulation on Safety Equipment of Ships.

4 QCVN 64: 2015/BGTVT National Technical Regulation for Inspection of sea-going ship’s products.

5 IBC Code: The International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (resolution MSC.4(48), as amended).

6 BCH Code: The Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (resolution MSC.9(53), as amended).

7 IGC Code: The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (resolution MSC.5(48), as amended).

8 Gas Carrier (GC) Code: The Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (resolution A.328(IX), as amended).

9 IGS: The Guidelines for Inert Gas Systems (MSC/Circ.282, as amended by MSC/Circ.353 and MSC/Circ.387).

10 2000 HSC Code: The International Code of Safety for High-Speed Craft, 2000 (resolution MSC.97(73), as amended).

11 VEC Systems: The Standards for Vapour Emission Control Systems (MSC/Circ.585).

12 IMDG Code: The International Maritime Dangerous Goods Code (resolution MSC.122(75), as amended).

13 1995 Diving Code*:* The Code of Safety for Diving Systems, 1995 (resolution A.831(19), as amended).

14 FSS Code: The International Code for Fire Safety Systems (resolution MSC.98(73), as amended).

15 International Convention for the Safety of Life at Sea (SOLAS), 1974, adopted by IMO on 1/11/1974, entered into force on 25/5/1980, as amended.

16 LSA Code: The International Life-Saving Appliance (LSA) Code (resolution MSC.48(66), as amended).

17 Resolution MSC.128(75): The Performance Standards for a Bridge Navigational Watch Alarm System (BNWAS).

18 Resolution A.481(XII): The Principles of Safe Manning.

19 Adoption of the Revised Performance Standards for Integrated Navigation Systems (INS) (IMO Resolution MSC.252(83)).

20 ISO 2412: Shipbuilding -- Colours of indicator lights.

21 Performance Standards for the Presentation of Navigation-Related Information on Shipborne Navigational Displays (IMO Resolution MSC.191(79)).

22 International Convention for the Prevention of Pollution from Ships, 1973, supplemented by Protocol of 1978 (MARPOL 73/78), entered into force on 2/10/1983.

1.2.2 Definitions

In the Regulation, the following definitions and explanations are to be used:

1 Alert: announces abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions:

(1) Emergency alarm: An alarm which indicates that immediate danger to human life or to the ship and its machinery exists and that immediate action should be taken, emergency alarm includes:

(a) General emergency alarm: An alarm given in the case of an emergency to all persons on board summoning passengers and crew to assembly stations.

(b) Fire alarm: An alarm to summon the crew in the case of fire.

(c) Water ingress detection main alarm: An alarm given when the water level reaches the main alarm level in cargo holds or other spaces on bulk carriers or single hold cargo ships.

(d) Those alerts giving warning of immediate personnel hazard, including:

(i) Fire-extinguishing pre-discharge alarm: An alarm warning of the imminent release of fire-extinguishing medium into a space.

(ii) Power-operated sliding watertight door closing alarm: An alarm warning of the closing of a power-operated sliding watertight door.

(e) For special ships (e.g., high-speed craft), additional alarms may be classified as emergency alarms in addition to the ones defined above.

(2) Alarm: a high priority of an alert. Condition requiring immediate attention and action, to maintain the safe navigation and operation of the ship, an alarm includes:

(a) Machinery alarm: An alarm which indicates a malfunction or other abnormal condition of the machinery and electrical installations.

(b) Steering gear alarm: An alarm which indicates a malfunction or other abnormal condition of the steering gear system, e.g., overload alarm, phase failure alarm, no-voltage alarm and hydraulic oil tank low-level alarm.

(c) Control system fault alarm: An alarm which indicates a failure of an automatic or remote control system, e.g., the navigation bridge propulsion control failure alarm.

(d) Bilge alarm: An alarm which indicates an abnormally high level of bilge water.

(e) Water ingress detection pre-alarm: An alarm given when the water level reaches a lower level in cargo holds or other spaces on bulk carriers or single hold cargo ships.

(f) Engineers' alarm: An alarm to be operated from the engine control room or at the manoeuvring platform, as appropriate, to alert personnel in the engineers' accommodation that assistance is needed in the engine-room.

(g) Personnel alarm: An alarm to confirm the safety of the engineer on duty when alone in the machinery spaces.

(h) Bridge Navigational Watch Alarm System (BNWAS): Second and third stage remote audible alarm as required by Chapter 5 QCVN 42: 2015/BGTVT and IMO Resolution MSC.128(75).

(i) Fire detection alarm: An alarm to alert the crew in the onboard safety centre, the continuously manned central control station, the navigation bridge or main fire control station or elsewhere that a fire has been detected.

(k) Power-operated watertight door fault alarms: Alarms which indicate low level in hydraulic fluid reservoirs, low gas pressure or loss of stored energy in hydraulic

accumulators, and loss of electrical power supply for power-operated sliding watertight doors.

(l) Navigation-related alarms: Alarms as specified in Appendix 5 Resolution MSC.252(83).

(m) For special ships (e.g., high-speed craft), additional alerts may be classified as alarms in addition to the ones defined above.

(3) Warning: Condition requiring no immediate attention or action. Warnings are presented for precautionary reasons to bring awareness of changed conditions which are not immediately hazardous, but may become so if no action is taken.

(4) Caution: Lowest priority of an alert. Awareness of a condition which does not warrant an alarm or warning condition, but still requires attention out of the ordinary consideration of the situation or of given information.

2 Indicator: Visual indication giving information about the condition of a system or equipment.

3 Signal: Audible indication giving information about the condition of a system or equipment.

4 Required alert or indicator: An alert or indicator required by applicable national technical regulations relating to seagoing ships or by IMO instruments referred to in paragraph 1.2.1 Section I.

5 Call: The request for contact, assistance and/or action from an individual to another person or group of persons, i.e. the complete procedure of signalling and indicating this request.

6 Silence: Manual stopping of an audible signal.

7 Acknowledge: Manual response to the receipt of an alert or call.

8 Aggregation*:* Combination of individual alerts to provide one alert (one alert represents many individual alerts), e.g., imminent slowdown or shutdown of the propulsion system alarm at the navigation bridge.

9 Grouping: is a generic term meaning the arrangement of individual alerts on alert panels or individual indicators on indicating panels, e.g., steering gear alerts at the workstation, etc.

10 Prioritization/Priority: The ordering of alerts in terms of their severity, function, sequence, etc.

11 Applicable regulations: regulations referred to in 1.2.1-1, 1.2.1-2 and 1.2.1-3 above.

II TECHNICAL REGULATIONS

CHAPTER 1 GENERAL

1.1 General

1.1.1 General

1 Alerts and indications covered by this Regulation are those required by relevant national technical regulations, international conventions, codes and documents specified in 1.2.1 Section I of the Regulations.

2 The alarm control of alerts and indications is to comply with requirements of relevant national technical regulations, international conventions, codes and documents specified in 1.2.1 Section I of the Regulations.

3 If alerts and indications other than those required by -1 above are intended to be installed onboard, they are not to interfere with those specified in -1. In addition, their signals are to be differently identified.

1.1.2 Other requirements

1 Materials for manufacturing onboard alert and indication devices are to be appropriate to their working environment.

2 The requirements for inspection and installation of alerts and indications specified in this Regulation are to be in line with requirements applied to each system covered by applied regulations.

3 Where the alerts and indications are installed in areas of explosion hazard, their devices and components are to be appropriately certified for safe usage in explosive gas atmosphere.

CHAPTER 2 REQUIREMENTS FOR ALERTS AND INDICATIONS

2.1 General

2.1.1 General

1 The presentation of alarms and indicators is to be clear, unambiguous, and consistent.

2 All required alerts are to be indicated by both audible and visual means, except the emergency alarms which are to be indicated primarily by a signal. In machinery spaces with high ambient noise levels, signals are to be supplemented by indicators. Signals and announcements may also be supplemented by indicators in accommodation spaces.

3 Where audible alerts are interrupted by public announcements, the visual alert is not to be affected.

4 A new alert condition is to be clearly distinguishable from those existing and acknowledged, e.g., existing and acknowledged alarms and warnings are indicated by a constant light and new (unacknowledged) alarms and warnings are indicated by a flashing light and an audible signal. Audible signals are to be stopped when silenced or acknowledged. At control positions or other suitable positions as required, alert systems are to clearly distinguish between no alert (normal condition), alert, silenced and acknowledged alert conditions.

5 Alerts are to be maintained until they are acknowledged and the visual indications of individual alerts are to remain until the fault has been corrected. If an alert has been acknowledged and a second fault occurs before the first is rectified, the audible signal and visual indication are to be repeated.

6 Alerts and acknowledged alerts are to be capable of being reset only in case the abnormal condition is rectified.

7 The presentation and handling of alarms, warnings and cautions indicated on the navigation bridge are to comply with the requirements of module C of resolution MSC.252(83) where applicable to ships with Integrated Navigation Systems (INS) and, where fitted, with the requirements of a bridge alert management system.

8 Required alert systems are to be continuously powered and are to have an automatic change-over to a stand-by power supply in case of loss of normal power supply. Emergency alarms and alarms are to be powered from the main source of electrical power and from the emergency sources of electrical power unless other arrangements are permitted by those regulations, as applicable, except that.

(1) the power-operated sliding watertight door closure alarm power sources may be those used to close the doors.

(2) the fire-extinguishing pre-discharge alarm power source may be the medium itself;

and

(3) continuously charged, dedicated accumulator batteries of an arrangement, location, and endurance equivalent to that of the emergency source of electrical power may be used instead of the emergency source.

9 Required rudder angle indicators and power-operated sliding watertight door position indicators are to be powered from the main source of electrical power and are to have an automatic changeover to the emergency source of electrical power in case of loss of normal power supply.

10 Failure of power supply of required alert and alarm systems is to be indicated by an audible and visual alarm or warning.

11 Required alert and alarm systems are to, as far as is practicable, be designed on the fail-to-safety principle, e.g., a detection circuit fault is to cause an audible and visual alarm.

12 Software and data for computerized alert and alarm systems are not to be permanently lost or altered as a result of power supply loss or fluctuation. Provision is to be made to prevent unintentional or unauthorized alteration of software and data.

13 Means are to be provided to prevent normal operating conditions from causing false alerts, e.g., provision of time delays because of normal transients.

14 The system is to be designed so that alerts can be acknowledged and silenced at the authorized control position. All alerts presented on the navigation bridge are to be capable of being acknowledged and silenced as required in module C of resolution MSC.252(83) where applicable to ships with Integrated Navigation Systems (INS) and, where fitted, with the requirements of a bridge alert management system.

15 To the extent considered practicable, general emergency alarm, fire alarm and fire-extinguishing pre-discharge alarm are to be arranged so that the audible signals can be heard regardless of failure of any one circuit or component.

16 Provision is to be made for functionally testing required alerts and indicators.

17 The number of alerts and indicators which are not required to be presented on the navigation bridge is to be minimized.

18 Cables for fire and general emergency alarms and public address systems and their power sources are to be of a fire-resistant type where they pass through high fire risk areas, and in addition for passenger ships, main vertical fire zones, other than those which they serve. Systems that are self-monitoring, fail-safe or duplicated with cable runs as widely separated as is practicable may be exempted provided that their functionality can be maintained. Equipment and cables for emergency alarms and indicators (e.g., watertight doors' position indicators) are to be arranged to minimize risk of total loss of service due to localized fire, collision, flooding or similar damage.

19 In order to facilitate maintenance and reduce risk of fire or harm to personnel, consideration is to be given to providing means of isolation of sensors fitted to tanks and

piping systems for flammable fluids or fluids at high temperature or pressure (e.g., valves, cocks, pockets for temperature sensors).

2.2 Audible Presentation of Alerts, Visual Presentation of Indicators and Calls

2.2.1 Audible Presentation of Alerts and Calls

1 Required alerts are to be clearly audible and distinguishable in all parts of the spaces where they are required. Where a distinct difference between the various audible signals and calls cannot be determined satisfactorily, as in machinery spaces with high ambient noise levels, it is permitted, to install common audible signal and call devices supplemented by visual indicators identifying the meaning of the audible signal or call.

2 The fire-extinguishing pre-discharge alarm is to have a characteristic which can be easily distinguished from any other audible signal or call installed in the space(s) concerned.

3 Audible signals of fire and fire detection alarm are to have a characteristic which can be easily distinguished from any other audible signal or call installed in the space(s).

4 Audible signals and calls are to have characteristics in accordance with 2.4.

5 In large spaces, more than one audible signal or call device are to be installed, in order to avoid shock to persons close to the source of sound and to ensure a uniform sound level over all the space as far as practicable.

6 Facilities for adjusting the frequency of audible signal within the prescribed limits may be provided to optimize their performance in the ambient conditions. The adjustment devices are to be sealed after setting has been completed.

7 Arrangements are not to be provided to adjust the sound pressure level of required audible signals. Where loudspeakers with built-in volume controls are used, the volume controls are to be automatically disabled by the release of the alert signal.

8 Electronically-generated signals may be accepted, provided all applicable requirements herein are complied with.

9 The use of a public address system for the general emergency alarm and the fire alarm may be accepted provided that:

(1) all requirements for those alerts in QCVN 21: 2015/BGTVT, QCVN 42: 2015/BGTVT, as well as in LSA Code, FSS Colde and SOLAS 74, as amended, are met;

(2) all the relevant requirements for required alerts in this Regulation are met;

(3) the system automatically overrides any other input system when an emergency alarm is required and the system automatically overrides any volume controls provided to give the required output for the emergency mode when an emergency alarm is required;

(4) the system is arranged to prevent feedback or other interference; and

(5) the system is arranged to minimize the effect of a single failure.

10 The general emergency alarm, fire alarm (if not incorporated in the general emergency alarm system), fire-extinguishing medium alarm and machinery alarm are to be so arranged that the failure of the power supply or the signal-generating and amplifying equipment (if any) to one will not affect the performance of the others. Where common audible signals and call devices are installed in accordance with 2.2.1-1, arrangements are to be provided to minimize the effect of such devices' failure.

11 The performance standards and functional requirements of the general emergency alarm are specified in 2.6.22-1 QCVN 42: 2015/BGTVT and Chapter 7 of LSA Code. In addition, the sound pressure level is to be in the 1/3-octave band about the fundamental frequency. In no case shall the level of an audible signal in a space exceed 120 dB(A).

12 With the exception of bells, audible signals are to have a signal frequency between 200 Hz and 2,500 Hz.

13 For the audible presentation of alerts on the navigation bridge, the requirements of resolution MSC.191(79), MSC/Circ.982, resolution A.694(17) and module C of resolution MSC.252(83) where applicable to ships with Integrated Navigation Systems (INS), and, where fitted, the requirements of a bridge alert management system, are to be observed.

14 For the audible presentation of navigational alerts on the bridge the sound pressure is to be at least 75 dB(A) but not greater than 85 dB(A) at a distance of one metre from the systems. Alternatively, it may be allowed to adjust the sound pressure to at least 10 dB(A) above the ambient noise level instead, if the ambient sound pressure on the bridge can be determined. The upper noise level is not to exceed 85 dB(A).

2.2.2 Visual Presentation of Indicators and Calls

1 Supplemental visual indicators and calls provided in machinery spaces with high ambient noise levels and in accommodation spaces are to:

(1) be clearly visible and distinguishable either directly or by reflection in all parts of the space in which they are required;

(2) be of a colour and symbol in accordance with tables 2/1 to 2/3;

(3) flash in accordance with 2.2.2-2. Instead of individual flashing lights a single flash or rotating white light in addition to a permanent individual indication may be used for light columns;

(4) be of high luminous intensity; and

(5) be provided in multiples in large spaces.

2 Flashing indicators and calls are to be illuminated for at least 50% of the cycle and have a pulse frequency in the range of 0.5 Hz to 1.5 Hz.

3 Visual indicators on the navigation bridge are not to interfere with night vision.

4 Indicators are to be clearly labeled unless standard visual indicator symbols, such as those in tables 2/1 to 2/3, are used. These standard visual indicator symbols are to be arranged in columns for ready identification from all directions. This applies in particular

to the emergency alarms in table 2/1. Standard visual indicator symbols may also be used on consoles, indicator panels, or as labels for indicator lights.

5 Indicator colours are to be in accordance with ISO Standard 2412. Indicator colours on navigational equipment are to be in accordance with par. 5.7 of Resolution MSC.191(79).

2.3 Requirements for Particular Alarms

2.3.1 Personnel alarm

1 The personnel alarm is to automatically set off an alarm on the navigation bridge or in the officers' quarters, as appropriate, and, if it is not reset from the machinery spaces in a satisfactory period, this is to be in a period not exceeding 30 min.

2 A pre-warning signal is to be provided in the machinery spaces which operates 3 min before the alarm required by 2.3.1-1 above.

3 The alarm system is to be put into operation:

(1) automatically when the engineer on duty has to attend machinery spaces in case of a machinery alarm; or

(2) manually by the engineer on duty when attending machinery spaces on routine checks.

4 The alarm system is to be disconnected by the engineer on duty after leaving the machinery spaces. When the system is brought into operation in accordance with 2.3.1-3(1), disconnection is not to be possible before the engineer has acknowledged the alarm in the machinery spaces.

5 The personnel alarm may also operate the engineers' alarm.

2.3.2 Bridge Navigational Watch Alarm Systems (BNWAS)

BNWAS is to conform to 5.5.22 Chapter 5 QCVN 42: 2015/BGTVT and Resolution MSC.128(75) on Performance Standards for a Bridge Navigational Watch Alarm System.

2.3.3 Engineers' alarm

In addition to manual operation from the machinery space, the engineers' alarm on ships with periodically unattended machinery spaces is to operate when the machinery alarm is not acknowledged in the machinery spaces or control room in a specified limited period of time, depending on the size of the ship but not exceeding 5 min.

2.3.4 General emergency alarm

1 Performance standards and functional requirements are provided in 2.6.22 Chapter 2 QCVN 42: 2015/BGTVT and Chapter 7 LSA Code. The general emergency alarm system is to be capable of being operated from the navigation bridge and at least one other strategic point. For passenger ships there is also to be an additional activation point in the safety centre. Strategic points are taken to mean those locations, other than the navigation bridge, from where emergency situations are intended to be controlled and the general

alarm system can be activated. A fire control station or a cargo control station is to normally be regarded as strategic points.

2 The system is to be audible throughout all the accommodation and normal crew working spaces. Normal crew working spaces include spaces where routine maintenance tasks or local control of machinery are undertaken.

3 In addition, on passenger ships, the system is to be recognizable at all places accessible to passengers as well as on all open decks.

2.4 Characteristics

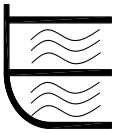
1 The emergency alarms, alarms and call signals listed are to have the audible and visual characteristics shown in tables 2/1 to 2/4.

2 All other alerts, indicators and call signals are to be clearly distinct from those listed in this section.

Table 2/1 Emergency alarms

Function	IMO Instrument	Applicable regulations	Audible		Visual		Remarks
			Device	Code	Colour	Symbol *	
General emergency alarm	LSA 7.2.1 SOLAS III/6.4 SOLAS II-2/7.9.4	QCVN 42: 2015/BGTVT 2.2.1-3; 2.6-22 QCVN 54:2015/BGTVT Part 8 1.2.1-2	Whistle Siren Bell Klaxon Horn	1a; 1b	Green/white	 	Used for summoning passengers to the assembly stations Used for summoning the crew to the boat stations. Sound levels in accordance with 7.2.1.2, 7.2.1.3 of LSA and 2.6-22 of QCVN 42: 2015/BGTVT
Fire alarm	SOLAS II-2/7.9.4		Bell Klaxon Siren Horn	2; 1b	Red		Used for summoning the crew to the fire stations on passenger ships.
	FSS 9.2.5.1	QCVN 21: 2015/BGTVT Part 5 29.2.5.1	Bell Klaxon Siren Horn	2; 3c; 3d	Red		Horn/bell in machinery space, buzzer/bell elsewhere
Fire-extinguishing pre-discharge alarm	FSS 5.2.1.3	QCVN 21: 2015/BGTVT Part 5 25.2.1-3	Siren Horn	2	Red	CO_2	Signal precedes release. Audible signal distinct from all others. When other fire-extinguishing mediums are used they are to be clearly identifiable.

Table 2/1 Emergency alarms (continued)

Function	IMO Instrument	Applicable regulations	Audible		Visual		Remarks
			Device	Code	Colour	Symbol *	
Power-operated sliding watertight door closing alarm	SOLAS II-1/13.7.1.6 and 13.8.2	QCVN 21: 2015/BGTVT Part 8F 3.6.4-2(6) and 3.6.4-4(2)	Horn Klaxon bell	2	Red, green	No symbol allocated	Signal at door precedes and continues during door closing. At remote position; door open – red indicator, door closed – green indicator. Red indicator on navigation bridge flashes while door closes.
Water ingress detection main	SOLAS XII/12.1, 12.2 and II-1/23-3	QCVN 21: 2015/BGTVT Part 3 13.8.5-1 13.8.5-2	Bell Buzzer Horn	2	Red		For cargo holds used for water ballast and the ballast tanks, an alarm overriding device may be installed.

Note: 1. * For use with visual indicator columns (see Appendix).

2. Audible signals are specified in Table 2/4.

Table 2/2 Alarms

Function	IMO Instrument	Applicable regulations	Audible		Visual		Remarks
			Device	Code	Colour	Symbol *	
Machinery alarm	SOLAS II-1/51.1	QCVN 60: 2013/BGTVT 4.3.3-1(5)	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere
Steering gear alarm	SOLAS II-1/29.5.2 II-1/29.8.4 II-1/29.12.2 II-1/30.3	QCVN 21: 2015/BGTVT Part 3 15.2.4-5;15.2.7-5; 15.2.7-7;15.3.1-2(4)	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere
Control system fault alarm	SOLAS II-1/29.8.4 II-1/49.5	QCVN 21:2015/BGTVT Part 3 15.3.1-2(4) 18.3.2-3(1)	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere
Bilge alarm	SOLAS II-1/48	QCVN 60:2013/BGTVT 4.2.3-1(2)	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere
Engineers' alarm	SOLAS II-1/38	QCVN 21: 2015/BGTVT Part 3 1.3.8	Horn Buzzer	3	Amber		Horn/buzzer in engineers' corridors, buzzer in engineers' cabins.
Personnel alarm	A.481(XII), Annex 2 7.3		Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere
Fire detection	FSS 8.2.5.2	QCVN 21: 2015/BGTVT Part 5 28.2.5-1	Bell Buzzer Horn	2	Red		

Table 2/2 Alarms (continued)

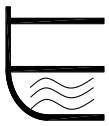
Function	IMO Instrument	Applicable regulations	Audible		Visual		Remarks
			Device	Code	Colour	Symbol *	
Fire detection alarm	SOLAS II-2/7.4.2 FSS 9.2.5.1	QCVN 21: 2015/BGTVT Part 5 7.4.2 29.2.5-1	Bell Buzzer Horn	2	Red		Should automatically actuate fire alarm if not acknowledged in 2 minutes or less. Horn/bell in machinery space, buzzer/bell elsewhere
	FSS10.2.4.1.3	30.2.4-1(3)	Bell Buzzer Horn	2	Red		
Activation of fixed local Application Fire-extinguishing system	SOLAS II-2/10.5.6.4	QCVN 21: 2015/BGTVT Part 3 10.5.5-4	Bell Buzzer Horn	2	Red		
Water ingress detection pre-alarm	SOLAS XII/12.1, 12.2 and II-1/23-3	QCVN 21: 2015/BGTVT Part 3 13.8.5-1 13.8.5-2	Bell Buzzer Horn	2	Amber		For cargo holds used for water ballast, an alarm overriding device may be installed.
Alarm system fault alarm	SOLAS II-1/51.2.2	QCVN 60: 2013/BGTVT 4.3.3-1(2)	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere.
Flashing light/ Rotating light	-	2.2.2-1 of this Regulation	-	-	White	No symbol allocated	
Cargo alarm	IBC BCH IGC GC	QCVN 21: 2015/BGTVT Part 8D Part 8E	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer in engine control room, cargo control station and navigation bridge

Table 2/2 Alarms (continued)

Function	IMO Instrument		Applicable regulations	Audible		Visual		Remarks
				Device	Code	Colour	Symbol *	
Gas detection alarm	For chlorine gas	IGC17.14.4., 17.14.1.4 GC 17.12.5(d)(iii) 17.12.5(a)(iv)	QCVN 21: 2015/BGTVT Part 8D 17.14.1.4 17.14.4.3	Siren Horn Bell	2	Red		
	Except for chlorine gas	IGC 13.6, 17.9, 16.2.1.2, 16.2.9 GC13.6, 17.11, 16.2(b), 16.10	QCVN 21: 2015/BGTVT Part 8D 13.6; 17.9	Buzzer Horn	3	Amber		xxx: Gas abbreviation may be indicated
Power-operated sliding watertight door	SOLAS II-1/13.7.3 II-1/13.7.8		QCVN 21: 2015/BGTVT Part 8F 3.6.4-3(1)(a) 3.6.4-3(6)(b)	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere

Notes: 1. * For use with visual indicator columns (see Appendix).

2. Audible signals are specified in Table 2/4.

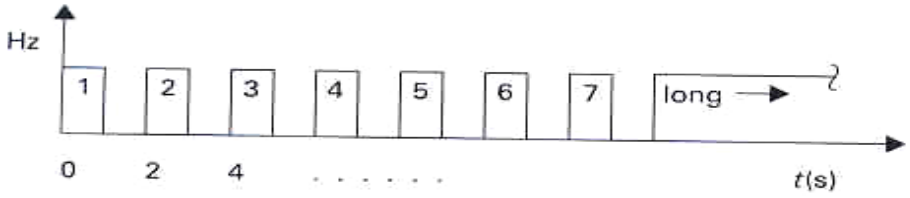
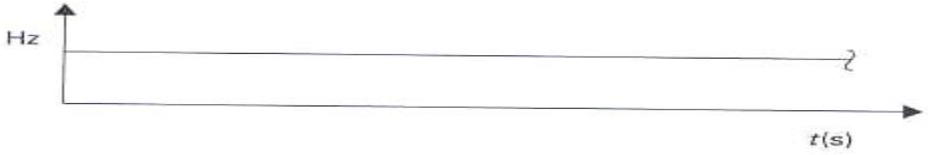
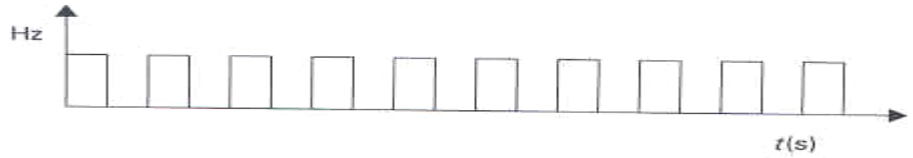
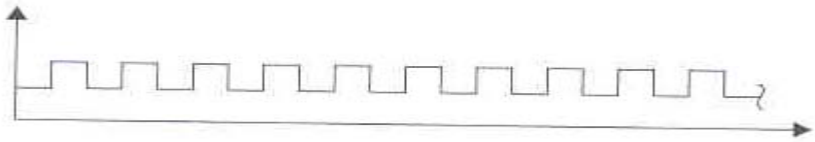
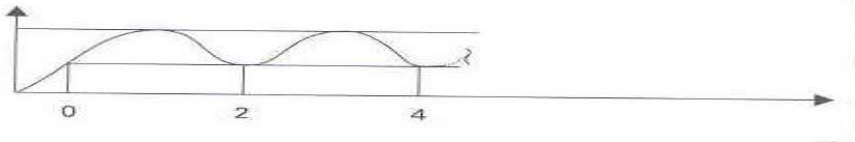
Table 2/3 Call Signal

Function	IMO Instrument	Applicable regulations	Audible		Visual		Remarks
			Device	Code	Colour	Symbol *	
Telephone	SOLAS II-1/50	QCVN 60: 2013/BGTVT 4.3.2	Horn Buzzer Bell	3.a	White		Horn/bell in machinery spaces and engineers‘ accommodation corridors; buzzer/bell in engine control room, on navigation bridge and in engineers‘ cabins.
Engine-room telegraph	SOLAS II-1/37	QCVN 21: 2015/BGTVT Part 3 1.3.7	Horn Bell Buzzer	2, 3.a	White		Horn/bell in machinery space, buzzer/bell in engine control room and on navigation bridge.

Notes: 1. * For use with visual indicator columns (see Appendix).

2. Audible signals are specified in Table 2/4.

Table 2/4 Audible signals and call waveforms

Audible Code	Waveform	Remarks
1.a 1.b	 Specific codes per muster list	General emergency alarm
2		Continuous until silenced or acknowledged
3.a 3.b 3.c 3.d	   	Optional waveforms to provide distinction between alarms. Pulse frequency between 0.5 Hz and 2.0 Hz

CHAPTER 3 GROUP AND AGGREGATION OF ALERTS AND INDICATORS

3.1 General

3.1.1 Purposes

1 In general, to reduce the variety in type and number of alerts and indicators so as to provide quick and unambiguous information to the personnel responsible for the safe operation of the ship.

2 On the navigation bridge:

(1) to enable the officer on watch to devote full attention to the safe navigation of the ship;

(2) to readily identify any condition or abnormal situation requiring action to maintain the safe navigation of the ship; and

(3) to avoid distraction by alerts which require attention but have no direct influence on the safe navigation of the ship and which do not require immediate action to restore or maintain the safe navigation of the ship.

3 In the machinery space/engine control room and at any machinery control station, to readily identify and locate any area of abnormal conditions (e.g., main propulsion machinery, steering gear, bilge level) and to enable the degree of urgency of remedial action to be assessed.

4 In the engineers' public rooms and in each of the engineers' cabins on ships where the machinery space/engine control room is periodically unattended, to inform the engineer officer on watch of any alert situation which requires immediate presence in the machinery space/engine control room.

3.2 General requirements

3.2.1 General requirements on group

1 Grouping and aggregation are not to conceal necessary information from the personnel responsible for the safe operation of the ship.

2 Where audible and visual alerts and indicators are required at central positions, e.g., on the navigation bridge, in the machinery space, or engine control room; the alerts and indicators, except emergency alarms, are to be arranged in groups, as far as practicable.

3 Where visual alerts are grouped or aggregated in accordance with 1.2.2-8 and 1.2.2-9 Section I, individual visual alerts are to be provided at the appropriate position to identify the specific alert condition.

4 The scope of alerts and indicators will vary with the type of ship and machinery. The basic recommendations given in tables 3/1.1 to 3/1.3 are to be adhered to.

3.2.2 Alert and Indicator Locations

1 Required alert and indicator type and location are to be in accordance with tables 3/2.1 to 3/2.8.

2 Applicable regulations in the IMO instruments referred to are to be consulted for additional requirements.

3 In applying tables 3/2.1 to 3/2.8, the following is to be noted:

(1) Abbreviation for priorities and indicators:

EM : emergency alarm

A : alarm

W : warning

C : caution

I : indication/indicator

AU : audible alert display (visual may be necessary in high-noise areas)

V : visual alert display

AU, V : both audible and visual alert display

VI : visual indicator

MI : measuring indicator

W/H : wheel house

CCR : cargo control room

FWBLAFFS: Fixed Water-Based Local Application Fire Fighting System

(2) “Cargo control station” means a position from which the cargo pumps and valves can be controlled. If a central cargo control station is not provided, then the alert or indicator is to be located in a suitable position for the operator (such as at the equipment monitored).

(3) If a cargo control station is not provided, the alert or indication is to be given at the gas detector device readout location.

(4) Where the types of alerts are not specifically identified in the IMO instruments referred to, the recommendations of the IMO Sub-Committee on Bulk Liquids and Gases are enclosed in parentheses, e.g. (A,V).

(5) Requirements for the function of alert and indication are also provided in other national technical regulations, including QCVN 21: 2015/BGTVT, QCVN 54: 2015/BGTVT and QCVN 42: 2015/BGTVT.

Table 3/1.1 Grouping/aggregation of alerts and indicators: machinery space attended, remote control of the main propulsion machinery from the navigation bridge not provided

<table>
<tr><td colspan="2">Navigation bridge [1]
One common audible alert device, except emergency alarms</td><td>Machinery space
Audible alert devices, in accordance with 1.2.2 Section I, 2.2.1 and 2.4 Chapter 2 Section II</td></tr>
<tr><td>Workstation for navigating and manoeuvring on navigation bridge</td><td>Other locations on navigation bridge</td><td>Machinery space or control room/station</td></tr>
<tr><td>Individual visual alerts and indicators for:
1. Each required steering gear
- Power unit power failure
- Control system power failure
- Hydraulic fluid level alarm
- Running indication
- Alarm system failure alarm
2. Engine-room telegraph
3. Rudder angle indicator
4. Propeller speed/direction/pitch
5. Telephone call</td><td>Visual alerts and indicators at any position on the navigation bridge other than the workstation for navigating and manoeuvring for:
1. Required alerts and indicators, as indicated under "Notes" in Table 3/2.1
2. Any non-required alert or indicator which the Administration considers necessary for the officer on watch.
3. Fire detection alarm</td><td>Visual alerts and indicators grouped at a position in the machinery space or, in the case of ships provided with a control room, in that control room. In complex machinery alarm arrangements, due account is to be taken of 3.1.1-3.
Alerts and indicators as indicated under "Notes" in Table 3/2.2
Engine-room telegraph.</td></tr>
<tr><td colspan="3">Note: [1] and/or ship safety centre on passenger ships.</td></tr>
</table>

Table 3/1.2 Grouping/aggregation of alerts and indicators: machinery space attended, remote control of the main propulsion machinery from the navigation bridge provided

Navigation bridge [2] One common audible alert device, except emergency alerts (e.g., buzzer, continuous)		**Machinery space** Audible alert devices, in accordance with 1.2.2 Section I, 2.2.1 and 2.4 Chapter 2 Section II
Workstation for navigating and manoeuvring on navigation bridge	**Other locations on navigation bridge**	**Machinery space or control room/station**
Individual visual alerts and indicators as in column 1 of Table 3/1.1 and plus: Failure of remote control for main propulsion machinery Starting air low pressure Propulsion control station in control	Visual alerts and indicators at any position on the navigation bridge other than the workstation for navigating and manoeuvring as in column 2 of Table 3/1.1 and plus: Machinery alarm, if provided	Visual Alerts and indicators as in column 3 of Table 3/1.1 and plus: Failure of remote control for main propulsion machinery Starting air low pressure Propulsion control station in control Indication of propulsion machinery orders from navigation bridge Alerts and indicators as indicated under "Notes" in Table 3/2.2
Note: [2] and/or ship safety centre on passenger ships.		

Table 3/1.3 Grouping/aggregation of alerts and indicators: machinery space unattended, remote control of the main propulsion machinery from the navigation bridge provided

Navigation bridge [2] One common audible alert device, except emergency alerts (e.g., buzzer, continuous)		**Machinery space** Audible alert devices, in accordance with 1.2.2 Section I, 2.2.1 and 2.4 Chapter 2 Section II	
Workstation for navigating and manoeuvring on navigation bridge	**Other locations on navigation bridge**	**Machinery space or control room**	**Engineers' public spaces and accommodations**
Individual visual alerts and indicators as in column 1 of Table 3/1.1 and Table 3/1.2, plus: Override of automatic propulsion shutdown, if provided.	Visual alerts and indicators at any position on the navigation bridge other than the workstation for navigating and manoeuvring as in column 2 of Table 3/1.1 and Table 3/1.2, plus: Machinery space fire detection alarm. Alarm conditions requiring action by or the attention of the officer on watch on the navigation bridge. Alerts and indicators as indicated under "Notes" in Table 3/2.1	As in column 3 of Table 3/1.1 and Table 3/1.2, plus: Alerts as indicated under "Notes" in Table 3/2.2. Alert system power failure alarm.	Engineers' alarm. Machinery space fire detection alarm. Machinery alarm *. Steering gear alarm (common) *. Machinery space bilge alarm *. Alarm system power failure alarm. Alerts and indicators under "Notes" in Table 3/2.5.
Notes: [2] and/or ship safety centre on passenger ships. * Alarm may be common.			

Table 3/2.1 Location: navigation bridge

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-1/QCVN 21: 2015/BGTVT	Rudder angle indicator	I	MI	Column 1, Table 3/1.1
	Steering gear power unit power failure	A	AU, V	Ditto
	Steering control system power failure	A	AU, V	Ditto
	Low steering gear hydraulic fluid level	A	AU, V	Ditto
	Steering gear running	I	VI	Ditto
	Steering system electric phase failure/ overload	A	AU, V	Column 1, Table 3/1.3
	Propulsion machinery remote control failure	A	AU, V	Column 1, Table 3/1.2 and Table 3/1.3
	Low propulsion starting air pressure	A	AU, V	Ditto
	Imminent slowdown or shutdown of propulsion system	A	AU, V	Column 1, Table 3/1.2
	Automatic propulsion shutdown override	I	VI	Column 1, Table 3/1.3
	Automatic shutdown of propulsion machinery	A	AU, V	Ditto
	Fault requiring action by or attention of the officer on watch	A	AU, V	Column 1, Table 3/1.3 (machinery alarm including 53.4.2 and 53.4.3)
	Propeller speed/direction/pitch	I	MI	Column 1, Table 3/1.2
	Propeller speed/direction/pitch	I	MI	Column 1, Table 3/1.3
	Engine-room telegraph	I	VI	Ditto
	Watertight door position	I	VI	Column 2, Table 3/1.1
	Watertight door low hydraulic fluid level	A	AU, V	Ditto
	Watertight door low gas pressure, loss of stored energy	A	AU, V	Ditto
	Watertight door electrical power loss	A	AU, V	Ditto

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-1/QCVN 21: 2015/BGTVT	High water level alarm	A	AU	!, where required
	Opening indicator	A	AU, V,VI	Column 2, Table 3/1.1
	Shell door position indicator	I	VI	Column 2, Table 3/1.1 Passenger ships with ro-ro cargo spaces or special category spaces. Recommended colours; red – door is not fully closed or not secured, green – door is fully closed and secured
	Water leakage detection indicator	I	VI	Column 2, Table 3/1.1 Passenger ships with ro-ro cargo spaces or special category spaces. (For details see regulation 17-1.3)
	Water level pre-alarm	A	AU, V	Column 2, Table 3/1.1 Bulk carriers and single hold cargo ships other than bulk carriers. For details see resolution MSC.188(79).
	Water level main-alarm	EM	AU, V	Ditto
	Propulsion control station in control	I	VI	Column 1, Table 3/1/2
	Alarm system normal power supply failure	A	AU, V	Column 2, Table 3/1.3
SOLAS II-2/QCVN 21: 2015/BGTVT	Hydrocarbon gas detection in tanker cargo pump rooms	A	AU, V	Column 2, Table 3/1.1
	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	Column 2, Table 3/1.2
	Loss of required ventilation	A	AU, V	Column 2, Table 3/1.1
	Fire door position	I	VI	Column 2, Table 3/1.1
	Fixed local application fire-extinguishing system activation	A	AU,V,VI	Column 2, Table 3/1.1 Indication of the activated zone

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS XII/QCVN 21:2015/BGTVT	Water level pre-alarm	A	AU, V	Column 2, Table 3/1.1 Bulk carriers and single hold cargo ships other than bulk carriers. For details see resolution MSC.188(79)
	Water level main-alarm	EM	AU, V	Ditto
A.481(XII)	Personnel alarm	A	AU, V	Column 2, Table 3/1.1
MSC.128(75)/QCVN 42: 2015/BGTVT	End of BNWAS dormant period	I	VI	Visible from all operational positions on the bridge where the Officer of the Watch may reasonably be expected to be stationed
	BNWAS first stage audible alarm	A	AU	Tone/modulation characteristics and volume level are to be adjustable during the commissioning
	Malfunction of, or power supply failure to, the BNWAS	W	AU, V	
SOLAS III/ QCVN 42: 2015/BGTVT	Position of stabilizer wings	I	VI	Column 2, Table 3/1.1
SOLAS V/QCVN 42: 2015/BGTVT	Rudder angle, propeller revolutions, the force and direction of thrust and, if applicable, the force and direction of lateral thrust and the pitch and operational mode	I	MI	Column 1, Table 3/1.1

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
IBC, IGC Code/QCVN 21: 2015/BGTVT	High and low temperature of cargo and high temperature of heat-exchanging medium	A	AU, V	Ammonium nitrate solution
	High temperature in tanks	A	AU,V,MI	Hydrogen peroxide solution over 60% but not over 70%
	Oxygen concentration in void spaces	A	AU,V,MI	Hydrogen peroxide solution over 60% but not over 70%
	Malfunctioning of temperature controls of cooling systems	A	(AU,V)	!, Propylene oxide
	High and low pressure in cargo tank	A	AU, V	High and low pressure alarms
	Gas detection equipment	A	AU, V	
	Hull or insulation temperature	A	AU, (V), MI	!
	Cargo high pressure, or high temperature at discharge of compressors	A	AU, V	Methylacetylene-propadiene mixtures
	Gas detecting system monitoring chlorine concentration	A	AU, V	!
	High pressure in chlorine cargo tank	A	AU,(V)	!
	High temperature in tanks	A	AU,V,MI	Hydrogen peroxide solution over 8% but not over 60%
	Oxygen concentration in void spaces	A	AU, V, MI	Ditto
	Failure of mechanical ventilation of cargo tanks	A	(AU, V)	!, Sulphur (molten)
	Liquid cargo in the ventilation system	A	(AU, V)	
	Vacuum protection of cargo tanks	A	(AU, V)	!
	Inert gas pressure monitoring	A	(AU, V)	!
	Gas detection equipment	A	AU, V	!
	Gas detection after bursting disk for chlorine	A	(AU, V)	!

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
HSC 2000/ QCVN 54: 2015/BGTVT	Automatic smoke detection system in areas of major and moderate fire hazard and other enclosed spaces in accommodation not regularly occupied	I	VI	!, Column 2, Table 3/1.2
	Automatic smoke detection and fire detection (with detectors sensing other than smoke) in main propulsion machinery room(s) additionally supervised by TV cameras monitored from the operating compartment	I	VI	Column 2, Table 3/1.2
	Fixed fire detection and fire alarm systems' power loss or fault condition	A	AU, V	Column 2, Table 3/1.2
	Fire detection signal +	A	AU	Column 2, Table 3/1.2 at alarm location easily accessible to crew at all time
	Fire detection manually operated call point section unit indicator	A	AU, V	Column 2, Table 3/1.3
	Fire detection for periodically unattended machinery spaces	A	AU, V	Column 2, Table 3/1.3; II-2/7.4.2*
	Fire door position	I	VI	Column 2, Table 3/1.2; II-2/9.6.4*
	Loss of required ventilation	A	AU, V	Column 2, Table 3/1.2; II-2/20.3.1.3*
	Fire door closing	I	VI	!Column 2, Table 3/1.2; II-2/9.6.4*
	Manually operated sprinkler system alarms	I	M, I	!, Column 2, Table 3/1.2
	Smoke detection system for cargo spaces	I	VI	!, Column 2, Table 3/1.2
	Liquid cooling system failure	A	AU, V	!
	Automatic fire detection system	A	AU, V	Column 2, Table 3/1.3; II-2/7.4.1.2;7.4.2*

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
HSC 2000/ QCVN 54: 2015/BGTVT	Bilge alarm	A	AU, V	Column 2, Table 3/1.3; II-1/48.1; 48.2*
	Remote machinery alarm system	A	AU, V	Column 2, Table 3/1.3
	Fuel line failure	A	AU, V	Column 2, Table 3/1.2
	Lubricating oil pressure or level falling below a safe level	A	AU, V	Column 2, Table 3/1.2
	Lubricating fluid supply failure or lubrication fluid pressure loss	A	AU, v	Column 2, Table 3/1.2
	Unattended space bilge alarm	A	AU, V	!, Column 2, Table 3/1.2; II-1/48.1*
	Failure of any remote or automatic control system	A	AU, V	Column 2, Table 3/1.3
	Malfunction or unsafe condition	A	AU, V	!, Column 2, Table 3/1.2
	Indication of conditions requiring immediate action	EM	AU, V	Column 2, Table 3/1.2 distinctive alarms in full view of crew members
	Indication of conditions requiring action to prevent degradation to an unsafe condition	C	V	Column 2, Table 3/1.2 visual display to be distinct from that of alarms referred to in previous row
	Emergency battery discharge	I	VI	Column 2, Table 3/1.2; II-1/42.5.3; 43.5.3*
	Steering system electric overload	A	AU, V	!, Column 2, Table 3/1.2; II-1/30.3*
	Steering system electric phase failure	A	AU, V	Column 2, Table 3/1.2; II-1/30.3*
	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 2, Table 3/1.2; II-1/45.4.2*
	Rudder angle indicator and rate-of-turn indicator	I	VI	Column 2, Table 3/1.2 II-1/29.11*; V/19.2.5.4*
	Propulsion indicator	I	VI	Column 2, Table 3/1.2
	Emergency steering position compass reading indicator	I	VI	Column 2, Table 3/1.2

Table 3/2.1 Location: navigation bridge (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
FSS Code/QCVN 21: 2015/BGTVT	Fire detection or automatic sprinkler operation	A	AU, V	Column 2, Table 3/1.1
	Fire detection system fault	A	AU, V	Ditto
	Smoke detection system power loss	A	AU, V	Ditto
	Smoke detection	A I	A, V, VI	Ditto
	Inert gas supply main pressure	I	MI	Column 2, Table 3/1.1 forward of non-return devices
	Inert gas pressure	I	MI	Column 2, Table 3/1.1 In slop tanks of combination carriers

Notes:

* Cross-reference to SOLAS regulation.

\+ These alarms may be omitted if they are provided at the central fire control station.

! Location is recommended.

Table 3/2.2 Location: machinery space/machinery control room

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-1/QCVN 21: 2015/BGTVT	Low steering gear fluid level	A	AU, V	Column 3, Table 3/1.1
	Steering gear running	I	VI	Column 3, Table 3/1.1
	Steering system electric phase failure or overload	A	AU, V	Column 3, Table 3/1.1
	Propulsion machinery remote control failure	A	AU, V	Column 3, Table 3/1.2 and Table 3/1.3
	Low propulsion starting air pressure	A	AU, V	Column 3, Table 3/1.2 and Table 3/1.3
	Oil-fired boiler low water level, air supply failure, or flame failure	A	AU, V	Column 3, Table 3/1.1
	Propulsion boiler high water level	A	AU, V	Column 3, Table 3/1.1
	Propulsion control station in control	I	VI	Column 3, Table 3/1.2
	Engine-room telegraph	I	VI	Column 3, Table 3/1.1
	Propulsion machinery orders from bridge	I	VI	Column 3, Table 3/1.2
	Boiler and propulsion machinery internal fire	A	AU, V	Column 3, Table 3/1.3
	Internal-combustion engine monitors	I	MI	Column 3, Table 3/1.3
	Bilge monitors	A	AU, V	Column 3, Table 3/1.3
	Alarm system normal power supply failure	A	AU, V	Column 3, Table 3/1.3
	Essential and important machinery parameters	A	AU, V	Column 3, Table 3/1.3 (machinery alarm)
	Emergency battery discharge	I	VI	Column 3, Table 3/1.1
	Automatic shutdown of propulsion machinery	A	AU, V	Column 3, Table 3/1.3
	Automatic propulsion shutdown override	I	VI	Column 3, Table 3/1.3
	Automatic change-over of propulsion auxiliaries	A	AU, V	Column 3, Table 3/1.3
	Electrical distribution system low insulation level	A or I	AU or I	!, Column 3, Table 3/1.1

Table 3/2.2 Location: machinery space/machinery control room (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-2/ QCVN 21: 2015/BGTVT	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	Column 3, Table 3/1.2
	High-pressure fuel oil leakage	A	AU, V	Column 3, Table 3/1.3
	Service fuel oil tank high temperature	A	AU, V	Column 3, Table 3/1.3
	Hydrocarbon gas detection in tankers cargo pump rooms	A	AU, V	Column 3, Table 3/1.1
	Fixed local application fire-extinguishing system activation	A I	AU, V I	Column 3, Table 3/1.1 Indication of the activated zone
IGC Code/QCVN 21: 2015/BGTVT	Loss of inert gas pressure between pipes	A	AU, V	!, Column 3, Table 3/1.1
	Cargo gas/fuel system gas detection	A	AU, V	!, Column 3, Table 3/1.1
	Flammable gas in ventilation duct	A	(AU, V)	!, Column 3, Table 3/1.1
	Flammable gas in ventilation casing	A	(AU, V)	!, Column 3, Table 3/1.1
A.481(XII)	Personnel alarm	A	AU, V	Column 3, Table 3/1.1
Marpol 73/78/ QCVN 26: 2014/BGTVT	Alarm for excessive oil content in oily mixture discharge into the sea	A	(AU, V)	!

Table 3/2.2 Location: machinery space/machinery control room (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
HSC 2000/ QCVN 54: 2015/BGTVT	Fire detection signal	A	AU, V	Column 3, Table 3/1.2
	Fire detection for periodically unattended machinery spaces	A	AU, V	Column 3, Table 3/1.3 II-2/7.4.2*
	Bilge alarm	A	AU, V	Column 3, Table 3/1. II-1/48.1;48.2*
	Remote machinery alarm system	A	AU, V	Column 3, Table 3/1.3
	Fuel line failure	A	AU, V	Column 3, Table 3/1.2
	Lubricating oil pressure or level falling below a safe level	A	AU, V	Column 3, Table 3/1.2
	Lubricating fluid supply failure or lubrication fluid pressure loss	A	AU, V	Column 3, Table 3/1.2
	High temperature alarm (oil fuel or settling tank)	A	V	!
	Unattended space bilge alarm	A	V	!, Column 3, Table 3/1.2 II-1/48.1*
	Failure of any remote or automatic control system	A	AU, V	Column 3, Table 3/1.3
	Malfunction or unsafe condition	A	AU, V	Column 3, Table 3/1.3
	Indication of conditions in 11.4.1.1 HSC 2000 requiring immediate action	A	AU, V	
	Indication of conditions in 11.4.1.2 HSC 2000 requiring action to prevent degradation to an unsafe condition	A	AU, V	Column 3, Table 3/1.2 visual display to be distinct from that of alarms referred to in 10.4.1.1
	Shutdown system activation	A	AU, V	!, Column 3, Table 3/1.2
	Steering system electric overload	A	AU, V	!, Column 3, Table 3/1.2 II-1/30.3*
	Steering system electric phase failure	A	AU, V	Column 3, Table 3/1.2 II-1/30.3*
	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 3, Table 3/1.2 II-1/45.4.2*

Table 3/2.2 Location: machinery space/machinery control room (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
FSS Code/ QCVN 21: 2015/BGTVT	Inert gas system			Column 3, Table 3/1.1
	- low water pressure/flow	A	AU, V	
	- high water level	A	AU, V	
	- high gas temperature	A	AU, V	
	- blower failure	A	AU, V	
	- oxygen content	A	AU, V	
	- power supply failure	A	AU, V	
	- water seal low level	A	AU, V	
	- low gas pressure	A	AU, V	
	- high gas pressure	A	AU, V	
	gas generator failure:	A	AU, V	
	- low fuel supply	A	AU, V	
	- power supply failure	A	AU, V	
	- control power failure	A	AU, V	
	Inert gas O2 content	I	MI	Column 3, Table 3/1.1

Notes:

* Cross-reference to SOLAS regulation.

! Location is recommended.

Table 3/2.3 Location: central fire control station where provided

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLASII-2/ QCVN 21: 2015/BGTVT	Fire detection in periodically unattended, automated or remotely controlled machinery space [+]	A	AU, V	
HSC 2000/ QCVN 54: 2015/BGTVT	Fixed fire detection and alarm systems' power loss or fault condition [+]	A	AU, V	
	Fire detection signal [+]	A	AU, V	
FSS Code/ QCVN 21: 2015/BGTVT	Automatic sprinkler system pressure	I	MI	
	Fire detection or automatic sprinkler operation [+]	A	AU, V	
	Fire detection system fault [+]	A	AU, V	
	Smoke detection system power loss [+]	A	AU, V	
	Smoke detection [+]	A I	AU, V VI	

Note:

[+] These alarms may be omitted if the central fire control station is on the navigation bridge.

Table 3/2.4 Location: at the equipment or at the location being monitored

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLASII-1/ QCVN 21: 2015/BGTVT	Rudder angle indicator	I	MI	At the steering gear compartment
	Shell valve closure	I	I	
	Water level of essential boiler	I	MI	
	Watertight door closing	EM	AU	Distinct from other alarms in area; in passenger areas and high-noise areas, add intermittent visual alarm
	Watertight door loss of stored energy	A	AU, V	At each local operating position
	Steam pressure	I	MI	
SOLAS II-2/ QCVN 21: 2015/BGTVT	Release of fire-extinguishing medium	EM	AU	Cargo pump-room
	Fuel oil tank level	I	MI	If provided
IGC, IGS Code/ QCVN 21: 2015/BGTVT	Content of oxygen in inert gas/trace of oxygen in nitrogen	A	(AU, V) MI	
	Warning on both sides of the airlock	A	AU, V	
	Indicates which one of the pressure-relief valves is out of service	I	VI	
	Inerting/extinguishing medium release	EM	AU	Gas-dangerous enclosed spaces
	Cargo pressure	I	MI	Local gauges if required
	Gas detection equipment	A	AU, V	
	Effluent drain valve position indicator	I	VI	!
	Tank pressure sensors	I	MI	!

Table 3/2.4 Location: at the equipment or at the location being monitored (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
VEC system/ QCVN 21: 2015/BGTVT	Isolation valve position indicator	I	VI	
	Liquid level indicator	I	MI	At the location where cargo transfer is controlled
	Liquid level indicator	I	MI	Portable gauging device on the tank
	Cargo vapour shutoff valve position indicator	I	VI	Near terminal vapour connection
	Terminal vapour pressure sensing device	I	MI	! (3)
	Terminal vapour pressure alarm	A	AU, V	! (3)
	Signal for sequential shutdown of onshore pumps and remotely operated cargo vapour shutoff valve	A	(AU, V)	! (3)
IMDG Code/ QCVN 21: 2015/BGTVT	Cargo control temperature less than +25 ^{o}C	A	AU, V	!, Alarms independent of power supply of the refrigeration system
HSC 2000/ QCVN 54: 2015/BGTVT	Release of fire-extinguishing medium	EM	AU, V	Spaces in which personnel normally work or to which they have access
	Fire door closing	EM	AU	Sounding alarm before the door begins to move and until completely closed
	Manually operated sprinkler system alarms	I	M, I	!, Column 2, Table 3/1.2
	Bilge cocks and valve position indication	I	VI	To indicate open or closed position

Table 3/2.4 Location: at the equipment or at the location being monitored (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
Diving Code/ QCVN 21: 2015/BGTVT	Diving bell internal pressure	I	MI	!, At the location of the attendant monitoring diving operations
	Diving bell, etc., overpressure alarm	A	AU,V	!, At the location of the attendant monitoring diving operations
	Diving equipment fire detection alarm	A	AU, V	!, At the location of the attendant monitoring diving operations
FSS Code/ QCVN 21: 2015/BGTVT	Release of fire-extinguishing medium	EM	AU	
	Automatic sprinkler system pressure	I	MI	At each section stop valve
	Automatic sprinkler system tank level	I	MI	
	Flue gas isolating valve open/closed	I	VI	
	Inert gas discharge temperature/pressure	I	MI	Measured at discharge of gas blower

Note:

! Location is recommended.

Table 3/2.5 Location: engineers' accommodation

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-1/ QCVN 21: 2015/BGTVT	Engineers‘ alarm	A	AU	Column 4, Table 3/1.3
	Fault requiring attention of the engineer on duty	A	AU, V	Column 4, Table 3/1.3 (machinery alarm)
SOLAS II-2/ QCVN 21: 2015/BGTVT	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	Column 4, Table 3/1.3
A.481(XII)	Personnel alarm	A	AU, V	Column 4, Table 3/1.3 (when the navigation bridge is unmanned)
HSC 2000/ QCVN 54: 2015/BGTVT	Fire detection for periodically unattended machinery spaces	A	AU, V	Column 4, Table 3/1.3 II-2/7.4.1.1;7.4.2*
Note: * Cross-reference to SOLAS regulation.				

Table 3/2.6 Location: miscellaneous

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLAS II-1/ QCVN 21: 2015/BGTVT	Watertight door position	I	VI	At operating stations from which the door is not visible. At all remote operating positions
	Bilge cocks and valves position	I	VI	At their place of operation
SOLAS II-2/ QCVN 21: 2015/BGTVT	Fire detection in periodically unattended, automated or remotely-controlled machinery space	A	AU, V	Alarm at attended location when navigation bridge is unmanned
	Fire detection alarm	A	AU, V	Alarm at location to ensure that any initial fire detection alarm is immediately received by a responsible member of crew
	Fire (special alarm to summon crew)	EM	AU	May be part of general emergency alarm
	Hydrocarbon gas detection in tankers cargo pump-rooms	A	AU, V	At the pump-room
	Temperature sensing devices for pumps installed in tankers cargo pump-rooms [+]	A	AU, V	At the pump control station
	Fixed local application fire-extinguishing system activation	A	AU, V	In each protected space. Protected space is a machinery space where a FWBLAFFS is installed.
	Fire alarm	EM	AU	Audible alarm within the space where detectors are located.
SOLAS III/ QCVN 42: 2015/BGTVT	General emergency alarm	EM	AU	Throughout all the accommodation and normal crew working spaces

Table 3/2.6 Location: miscellaneous (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
MSC.128(75)/ QCVN 42: 2015/BGTVT	BNWAS second stage audible alarm	A	AU	Locations of the master, officers and further crew members capable of taking corrective action
	BNWAS third stage audible alarm	A	AU	Locations of the master, officers and further crew members capable of taking corrective action
HSC 2000/ QCVN 54: 2015/BGTVT	General emergency alarm	EM	AU	Clearly audible throughout all the accommodation and normal spaces and open decks 8.2.2.2 III/6.4.2 *
	Fire detection signal	A	AU	Clearly audible throughout the crew accommodation and service spaces
	Fire detection manually operated call point section unit indicator	A	AU, V	Alarm at location easily accessible to crew at all times
Diving Code 1995/QCVN 21: 2015/BGTVT				
	Compression chamber internal pressure	I	MI	At central control position
	Diving bell external pressure	I	MI	Within the bell
	Diving equipment fire detection alarm	A	AU, V	!, At an attended location other than the above
	Compression chamber/diving bell parameters	I	MI	At central control position
	Diving bell oxygen and CO2 levels	I	MI	Within the bell

Table 3/2.6 Location: miscellaneous (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
FSS Code/ QCVN 21: 2015/BGTVT	Fire detection or automatic sprinkler operation	A	AU, V	Alarm at attended location other than navigation bridge and central fire control station
	Fire detection alarm	A	AU, V	Alarm at location easily accessible to crew at all times
	Fire detection alarm not receiving attention	EM	AU	Alarmed to crew; may be part of general emergency alarm
LSA Code/ QCVN 42: 2015/BGTVT	General emergency alarm	EM	AU	Throughout the accommodation and normal crew working spaces
Notes: * Cross-reference to SOLAS regulation. + These alarms may be omitted if they are provided at the cargo control station.				

Table 3/2.7 Location: cargo control station

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLASII-2/ QCVN 21: 2015/BGTVT	Cargo tank high level alarm and gauging +	A	AU, V MI	!, If required
	Temperature sensing devices for pumps installed in tankers cargo pump rooms +	A	AU, V	
	Hydrocarbon gas detection in tankers cargo pump rooms	A	AU, V	
IBC, IGC Code/ QCVN 21: 2015/BGTVT	High level of the liquid in any tank	A	AU, V MI	!, (2)
	Failure of mechanical ventilation system for maintaining low gas concentration in cargo tanks	A	AU, V	!, Sulphur liquid
	Power failure on any system essential for safe loading	A	AU, V	!, (2)
	High level alarm, cargo tank	A	AU, V	!, (2)
	Cargo level	I	MI	(2)
	High and low pressure in cargo tank	A	MI, AU, (V)	(2)
	Gas detection equipment	A	AU, (V)	
	Cargo high pressure, or high temperature at discharge of compressors	A	AU, V	(2), hỗn hợp Methylacetylenepropadiene mixtures
	Shutdown of submerged cargo pumps	A	(AU, V)	
	Gas detecting system monitoring chlorine concentration	A	AU, V	!, (3)
	High pressure in cargo tanks(chlorine)	A	AU, (V)	! (2)
	High liquid level in cargo tank	A	AU, V	! (2)
	Cargo temperature	I	MI	! (2)

Table 3/2.7 Location: cargo control station (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
IBC, IGC Code/ QCVN 21: 2015/BGTVT	Hull or insulation temperature	I A	MI AU, (V)	!
	Cargo tank temperature	I	MI	!, (2)
	Gas detection equipment	A	AU, V MI	!, (3)
	Gas detection after bursting disk for chlorine	A	(A, V) MI	!, (2)
	High level of phosphorus	A	(AU, V)	!, (2)
	Overflow alarm	A	AU, V	!
	Liquid cargo in the vent system	A	(AU, V)	! (2)
	Inert gas pressure monitoring	A	(AU, V)	!
	Effluent drain valve position indicator	I	VI	!
	Tank pressure sensors	I	MI	!, If required
VEC Sytem/ QCVN 21: 2015/BGTVT	Tank overflow alarm	A	AU, V	!, (2)
	Signal for sequential shutdown of onshore pumps or valves or both and of the ships‘ valves	A	(AU, V)	!, (2)
	Overflow alarm and shutdown signal	A	(AU, V)	At an attended location !, (2)
	Loss of power to the alarm system	A	(AU, V)	!, (2)
	Tank level sensor electrical circuitry failure	A	(AU, V)	!, (2)
	Main vapour collection line pressure	I	MI	!, (2) VEC is equipped, common to two or more tanks
	High vapour pressure alarm	A	(AU, V)	!, (2) VEC is equipped, common to two or more tanks
	Low vapour pressure alarm	A	(AU, V)	!, (2) VEC is equipped, common to two or more tanks

Table 3/2.7 Location: cargo control station (continued)

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
FSS Code/ QCVN 21: 2015/BGTVT	Inert gas pressure	I	MI	
	Inert gas O2 content	I	MI	
	Inert gas system			
	- low water pressure/flow	A	AU, V	
	- high water level	A	AU, V	
	- high gas temperature	A	AU, V	
	- blower failure	A	AU, V	
	- oxygen content	A	AU, V	
	- power supply failure	A	AU, V	
	- water seal low level	A	AU, V	
	- low gas pressure	A	AU, V	
	- high gas pressure	A	AU, V	
	gas generator failure	A	AU, V	
	- low fuel supply	A	AU, V	
	- power supply failure	A	AU, V	
	- control power failure	A	AU, V	

Notes:

* Cross-reference to SOLAS regulation.

+ These alarms may be omitted if they are provided at the pump control.

! Location is recommended (2) and (3) see notes following paragraph 3.2.2-3.

Table 3/2.8 Location: not indicated by IMO instruments and national technical regulations

IMO instrument/ Applicable regulations	Function	Priority	Display	Notes
SOLASII-1/ QCVN 21: 2015/BGTVT	Draught indicator	I	MI	Passenger ships only (if required), for details see regulation II-1/8.7.3* Recommended Location: W/H
SOLAS II-2/ QCVN 21: 2015/BGTVT	Pump-room bilge high level alarm	A	AU, V	Recommended Location: W/H or ECR
	Flammable vapour monitoring	I	MI	
IBC Code/ QCVN 21: 2015/BGTVT	Alarm & Monitoring of cargo temperature	A	A, V, MI	Alert system only required if overheating or overcooling could result in a dangerous condition Recommended Location: CCR
		I	MI	Recommended Location: CCR
	Cargo tank levels	A	AU, V	Recommended Location: W/H or CCR
Note: * Cross-reference to SOLAS regulation.				

III REGULATIONS ON MANAGEMENT

1 Regulations on supervision and certification of Vietnam Register

1.1 Alert and indication systems are to be type-approved by VR in accordance with QCVN 64: 2015/BGTVT to assure the compliance of the systems with corresponding requirements in Section II of the Regulation.

1.2 For alerts and indications as part of alert and safety devices required by applied regulations, the inspection and certification of those are to be carried out only in accordance with the applied regulations.

2 Document management

2.1 Archive of registry documents

All documents issued to alerts and indication by VR are to be stored and maintained at Vietnam Register offices.

IV RESPONSIBILITIES OF ORGANIZATIONS, INDIVIDUALS

1 Responsibilities of ship owners

To implement all relevant requirements for registry and maintain good working condition of alert and indication systems covered by this Regulation on seagoing ships.

2 Responsibilities of organizations, individuals in manufacturing and installing alert and indication systems

2.1 To be subjected to VR's supervision prescribed in this Regulation in manufacturing, installing alert and indication systems in seagoing ships.

3 Responsibilities of Vietnam Register

3.1 To carry out the technical supervision and to certify alert and indication systems on seagoing ships in accordance with relevant requirements specified in this Regulation.

3.2 Based on the fact, Vietnam Register is to have responsibility to petition the Ministry of Transport for amendment, supplementation of the Regulation where necessary or on schedule specified in the Law of Standards and Technical Regulations.

V IMPLEMENTATION

1 Application of the Regulation

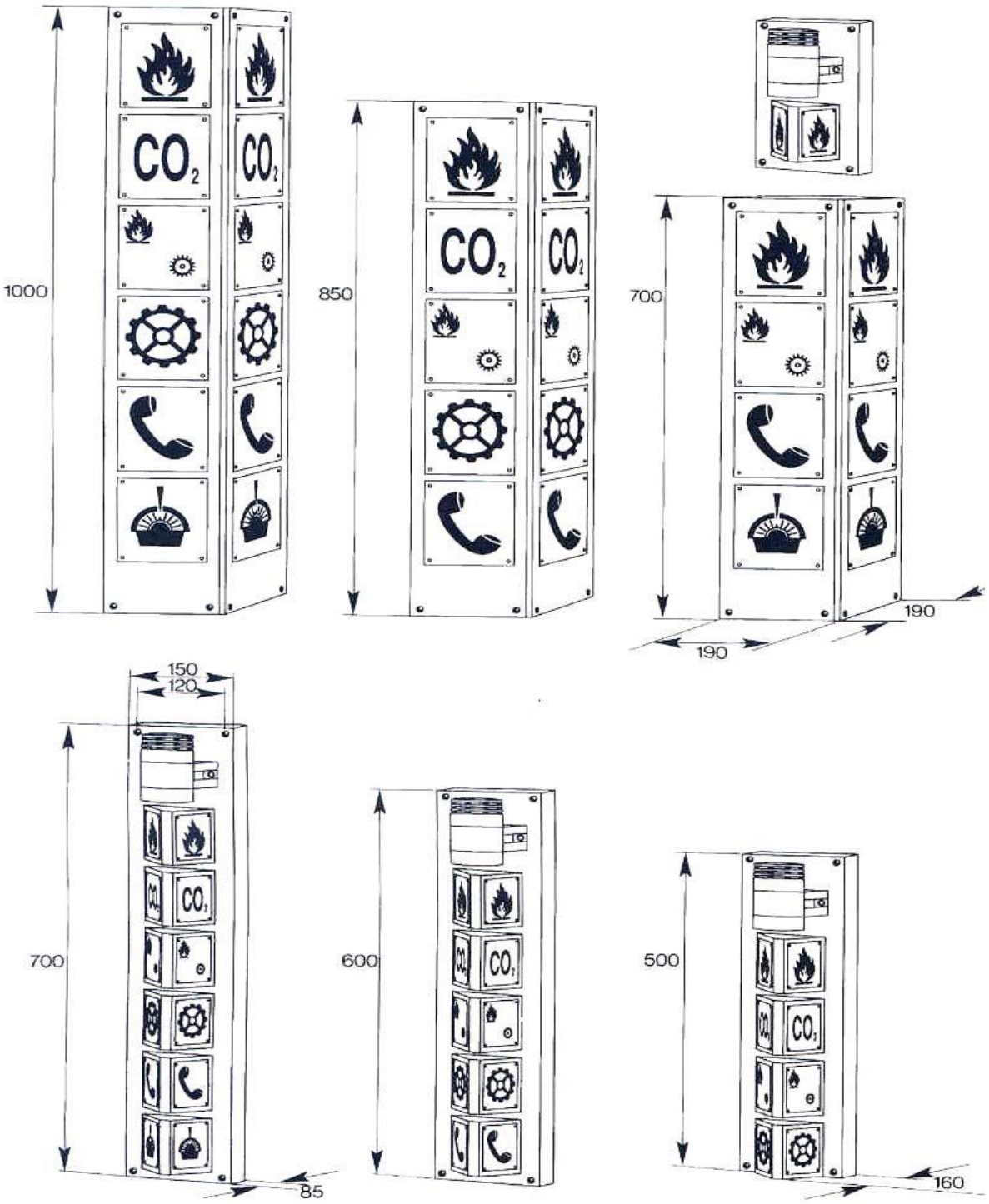
1.1 In case of inconsistency between the requirements in this Regulation and those in applied regulations, the requirements of applied regulations are to prevail.

1.2 In case of inconsistency between the requirements of this Regulation and those of international conventions to which Vietnam is a member, the requirements of those international Conventions are to prevail over the requirements of this Regulation for ships engaged in international voyages.

1.3 In case the documents referred to in this Regulation are amended, supplemented or replaced, the latter is to prevail over the former.

1.4 Unless detailed provision is made for existing ships, this Regulation is to apply to ships of which early stages of the new building are on or after effective date of this Regulation.

Appendix



Remark: Dimensions are in mm