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CODE ON ALERTS AND INDICATORS, 2025

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO that, by resolution A.1021(26), it adopted the Code on Alarms and Indicators, 2009, incorporating therein provisions on alarms and indicators contained in respective IMO instruments,

RECOGNIZING the need to further update the provisions of the Code, thereby ensuring compliance with the requirements of the IMO instruments that have been adopted and/or amended since the Code was adopted and, thus, to eliminate contradictions, ambiguities and unnecessary redundancies,

HAVING CONSIDERED the recommendations made by the Marine Environment Protection Committee at its eighty-third session and the Maritime Safety Committee at its 110th session,

1 ADOPTS the Code on Alerts and Indicators, 2025, set out in the annex to the present resolution;

2 RECOMMENDS that Governments:

(a) take appropriate action to implement the Code; and

(b) use the Code as an international safety standard for designing alarms and indicators for ships, ships' equipment and machinery;

3 REQUESTS the Marine Environment Protection Committee and the Maritime Safety Committee to keep the Code under review and to update it as necessary;

4 REVOKES resolution A.1021(26).

ANNEX

CODE ON ALERTS AND INDICATORS, 2025

1 PURPOSE AND SCOPE

1.1 The Code is intended to provide general design guidance and to promote uniformity of type, location and priority for those alerts and indicators which are required by the International Convention for the Safety of Life at Sea, 1974 (1974 SOLAS Convention); associated codes (BCH, Diving, FSS, Gas Carrier, 2000 HSC, IBC, IGC, IMDG, LSA, 2009 MODU, IGF, 2023 Diving, OSV Chemical, IP, ISPS and Nuclear Merchant Ship Codes); the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78); the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels (1993 Torremolinos (SFV) Protocol) as modified by the Cape Town Agreement of 2012; the Guidelines for Inert Gas Systems (IGS); the Standards for Vapour Emission Control Systems (VEC); the Performance Standards for a Bridge Navigational Watch Alarm System (BNWAS); EGCS Guidelines, BWM Convention, BWMS Code and the Revised Performance Standards for Integrated Navigation Systems (INS).

1.2 The Code benefits designers and operators by consolidating in one document the references to priorities, aggregation, grouping, locations and types, including colours, symbols, etc. of shipboard alerts and indicators. Where the applicable IMO instruments do not specify the type and location of particular alerts, this information, as far as practicable, is presented in this Code to promote uniform application.

1.3 In order to achieve similar uniformity, the Code also serves as guidance for alerts and indicators included in IMO instruments other than those referred to in 1.1.

1.4 The management and presentation of alerts should conform additionally to the appropriate performance standards adopted by the Organization.

2 APPLICATION

The Code applies to shipboard alerts and indicators.

3 DEFINITIONS

3.1 *Alert*: Alerts announce 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.

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

.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.

3.2 The following alerts are classified as emergency alarms:

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

.2 *Fire alarm*: An alarm to summon the crew in the case of fire.

.3 *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.

.4 Those alerts giving warning of immediate personnel hazard, including:

.1 *Fire-extinguishing pre-discharge alarm*: An alarm warning of the imminent release of fire-extinguishing medium into a space; and

.2 *Power-operated sliding watertight door closing alarm*: An alarm required by SOLAS regulation II-1/13.6.1.6, warning of the closing of a power-operated sliding watertight door.

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

3.3 The following alerts are classified as alarms:

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

.2 *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.

.3 *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.

.4 *Bilge alarm*: An alarm which indicates an abnormally high level of bilge water.

.5 *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 single hold cargo ships, or multiple hold cargo ships other than bulk carriers and tankers constructed on or after 1 January 2024.

.6 *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.

.7 *Personnel alarm*: An alarm to confirm the safety of the engineer on duty when alone in the machinery spaces.

.8 *Bridge Navigational Watch Alarm System (BNWAS)*: Second and third stage remote audible alarm as required by resolution MSC.128(75).

.9 *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.

.10 *Fixed local application fire-extinguishing system activation alarm*: An alarm to alert the crew that the system has been discharged, with indication of the section activated.

.11 Alarms indicating faults in alert management or detection systems or loss of their power supplies.

.12 *Cargo alarm*: An alarm which indicates abnormal conditions originating in cargo, or in systems for the preservation or safety of cargo.

.13 *Gas detection alarm*: An alarm which indicates that gas has been detected.

.14 *Power-operated sliding 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.

.15 Navigation-related alarms as specified in the Revised Performance Standards for Integrated Navigation Systems (INS) (resolution MSC.252(83), appendix 5).

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

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

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

3.6 *Required alert or indicator*: An alert or indicator required by IMO instruments referred to in paragraph 1.1. Any other alerts and indicators are referred to in this Code as non-required alerts or indicators.

3.7 *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.

3.8 *Silence*: Manual stopping of an audible signal.

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

3.10 *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.

3.11 *Grouping:* 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 for navigating and manoeuvring on the navigation bridge, or door indicators on a watertight door position indicating panel at the workstation for safety on the navigation bridge.

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

4 GENERAL

4.1 The presentation of alerts and indicators should be clear, distinctive, unambiguous and consistent.

4.2 All required alerts should be indicated by both audible and visual means, except the emergency alarms of 3.2 which should be indicated primarily by a signal. In machinery spaces with high ambient noise levels, signals should be supplemented by indicators, presented in accordance with 6.1. Signals and announcements may also be supplemented by indicators in accommodation spaces.

4.3 Where audible alerts are interrupted by public announcements the visual alert should not be affected.

4.4 A new alert condition should 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 should be stopped when silenced or acknowledged. At control positions or other suitable positions as required, alert systems should clearly distinguish between no alert (normal condition), alert, silenced and acknowledged alert conditions.

4.5 Alerts should be maintained until they are acknowledged and the visual indications of individual alerts should 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 should be repeated.

4.6 Alerts and acknowledged alerts should be capable of being reset only in case the abnormal condition is rectified.

4.7 The presentation and handling of alarms, warnings and cautions indicated on the navigation bridge should 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.

4.8 Required alert systems should be continuously powered and should have an automatic change-over to a stand-by power supply in case of loss of normal power supply. Emergency alarms and alarms should be powered from the main source of electrical power and from the emergency sources of electrical power defined by SOLAS regulations II-1/42 or II-1/43 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.

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

4.10 Failure of power supply of required alert and alarm systems should be indicated by an audible and visual alarm or warning.

4.11 Required alert and alarm systems should, as far as is practicable, be designed on the fail-to-safety principle, e.g. a detection circuit fault should cause an audible and visual alarm; see also FSS Code, chapter 9, paragraph 2.5.1.5.

4.12 Provision should be made for functionally testing required alerts and indicators. The Administration should ensure, e.g. by training and drills, that the crew is familiar with all alerts.

4.13 Required alert, alarm and indicator systems should be functionally independent of control systems and equipment, or should achieve equivalent redundancy. Any additional requirements for particular alerts in the IMO instruments applicable to the ship should be complied with.

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

4.15 Cables for fire and general emergency alarms and public address systems and their power sources should 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) should be arranged to minimize risk of total loss of service due to localized fire, collision, flooding or similar damage.

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

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

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

4.19 The system should be designed so that alerts can be acknowledged and silenced at the authorized control position. All alerts presented on the navigation bridge should 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.

4.20 In order to facilitate maintenance and reduce risk of fire or harm to personnel, consideration should 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).

5 AUDIBLE PRESENTATION OF ALERTS AND CALLS

5.1 Required alerts should 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.

5.2 The fire-extinguishing pre-discharge alarm should have a characteristic which can be easily distinguished from any other audible signal or call installed in the space(s) concerned. Audible signals of fire and fire detection alarm should have a characteristic which can be easily distinguished from any other audible signal or call installed in the space(s).

5.3 Audible signals and calls should have characteristics in accordance with section 7.

5.4 In large spaces, more than one audible signal or call device should 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.

5.5 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 should be sealed, to the satisfaction of the Administration, after setting has been completed.

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

5.7 Administrations may accept electronically-generated signals, provided all applicable requirements herein are complied with.

5.8 Administrations may accept the use of a public address system for the general emergency alarm and the fire alarm provided that:

.1 all requirements for those alerts of the LSA Code, FSS Code and the 1974 SOLAS Convention, as amended, are met;

.2 all the relevant requirements for required alerts in this Code 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.

5.9 The general emergency alarm, fire alarm (if not incorporated in the general emergency alarm system), fire-extinguishing medium alarm and machinery alarm should be arranged so 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 5.1, arrangements should be provided to minimize the effect of such devices' failure.

5.10 The performance standards and functional requirements of the general emergency alarm are specified in the LSA Code, chapter VII, section 7.2. In addition, the sound pressure level should be in the 1/3-octave band about the fundamental frequency. In no case should the level of an audible signal in a space exceed 120 dB(A).

5.11 With the exception of bells, audible signals should have a signal frequency between 200 Hz and 2,500 Hz.

5.12 For the audible presentation of alerts on the navigation bridge, the requirements of resolution MSC.191(79) as amended by resolution MSC.466(101), MSC.1/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, should be observed.

5.13 For the audible presentation of navigational alerts on the bridge, the sound pressure should 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 should not exceed 85 dB(A).

6 VISUAL PRESENTATION OF INDICATORS AND CALLS

6.1 Supplemental visual indicators and calls provided in machinery spaces with high ambient noise levels and in accommodation spaces should:

.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 7.1.1 to 7.1.3;

.3 flash in accordance with 6.2. 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.

6.2 Flashing indicators and calls should 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.

6.3 Visual indicators on the navigation bridge should not interfere with night vision. For the visual presentation of alerts on the navigation bridge the requirements of resolution MSC.191(79) as amended by resolution MSC.466(101), 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, should be observed.

6.4 Indicators should be clearly labelled unless standard visual indicator symbols, such as those in tables 7.1.1 to 7.1.3, are used. These standard visual indicator symbols should be arranged in columns for ready identification from all directions. This applies in particular to the emergency alarms in table 7.1.1. Standard visual indicator symbols may also be used on consoles, indicator panels, or as labels for indicator lights.

6.5 Indicator colours should be in accordance with ISO Standard 2412, as deemed appropriate by the Administration. Indicator colours on navigational equipment should be in accordance with resolution MSC.191(79), paragraph 5.7.

6.6 On mobile offshore drilling units (MODUs), where supplemental visual indicators are installed for general emergency alarms, the colour of these supplemental indicators may be amber, provided they flash with a pulse frequency of at least 4 Hz.

7 CHARACTERISTICS

The emergency alarms, alarms and call signals listed should have the audible and visual characteristics shown in the tables of this section. All other alerts, indicators and call signals should be clearly distinct from those listed in this section to the satisfaction of the Administration. These tables are not all-inclusive and other alerts may be added by the Administration in a manner consistent with this Code.

Table 7.1.1 – Emergency alarms

(*Note*: See table 7.2 for audible signals)

Function	IMO Instrument	Audible		Visual		Remarks
		Device	Code	Colour	Symbol*	
General emergency alarm	LSA Ch. VII 7.2.1 SOLAS III/6.4 SOLAS II-2/7.9.4	Whistle Siren Bell Klaxon Horn	1.a, 1.b	Green/ White	 passengers crew	Used for summoning passengers to the assembly stations. Used for summoning the crew to the boat stations. Sound levels in accordance with LSA Code Ch. VII 7.2.1.2, 7.2.1.3.
Fire alarm	SOLAS II-2/7.9.4	Bell Klaxon Siren Horn	2, 1.b	Red		Used for summoning the crew to the fire stations on passenger ships.
	FSS 9.2.5.1	Bell Klaxon Siren Horn	2, 3.c, 3.d	Red		Horn/bell in machinery space, buzzer/bell elsewhere.
Fire-extinguishing pre-discharge alarm	FSS 5.2.1.3	Siren Horn	2	Red	CO_2	Signal precedes release. Audible signal distinct from all others. When other fire-extinguishing mediums are used they should be clearly identifiable.
Power-operated sliding watertight door closing alarm	SOLAS II-1/13.6.1.6 and 13.7.2	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 alarm	SOLAS XII/12.1, 12.2, II-1/25.3 and II-1/25-1	Bell Buzzer Horn	2	Red		For cargo holds used for water ballast and the ballast tanks, an alarm overriding device may be installed.

* For use with visual indicator columns (see appendix).

Table 7.1.2 – Alarms

(*Note*: See table 7.2 for audible signals. For the presentation of navigation related alerts, resolution MSC.191(79) should be observed.)

Function	IMO Instrument	Audible		Visual*		Remarks
		Device	Code	Colour	Symbol*	
Machinery alarm	SOLAS II-1/51.1	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	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere.
Control system fault alarm	SOLAS II-1/29.8.4 II-1/49.5	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere.
Bilge alarm	SOLAS II-1/48 II-1/25-1.3.2, II-1/35-1.2.6.2, XII/9.2	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere.
Engineers' alarm	SOLAS II-1/38	Horn Buzzer	3	Amber		Horn/buzzer in engineers' corridors, buzzer in engineers' cabins.
Personnel alarm	3.3.7 and 8.1 of the present Code	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere.
Fire detection alarm	FSS 8.2.5.2	Bell Buzzer Horn	2	Red		
	SOLAS II-2/7.4.2 FSS 9.2.5.1	Ditto	2	Red		Should automatically actuate fire alarm if not acknowledged in 2 minutes or less. Horn/bell in machinery space, buzzer/bell elsewhere.
	FSS 10.2.4.1.2	Ditto	2	Red		
Activation of fixed local Application Fire-extinguishing system	SOLAS II-2/10.5.6.4	Ditto	2	Red		
Water ingress detection pre-alarm	SOLAS XII/12.1, 12.2, II-1/25.3 and II-1/25-1	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 II-1/51.1.1, II-1/51.1.3	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere.
Flashing light/ Rotating light	6.1 of the present Code	-	-	White	No symbol allocated	

* For use with visual indicator columns (see appendix).

Table 7.1.2 – Alarms (continued)

Function		IMO Instrument	Audible		Visual*		Remarks
			Device	Code	Colour	Symbol*	
Cargo alarm		IBC, BCH, 2014 IGC, GC	Horn Buzzer	3	Amber	No symbol allocated	See tables 10.1.1 to 10.1.8 of the present Code for IMO instrument references. Horn in machinery space, buzzer in engine control room, cargo control station and navigation bridge.
Gas detection alarm	For chlorine gas	2014 IGC 17.13.4.3 17.13.4.4 GC 17.12.5(d)(iii) 17.12.5(d)(iv)	Siren Horn Bell	2	Red	GAS Cl	
	Except for chlorine gas	2014 IGC 17.5.2, 16.4.2, 16.4.8 16.5.3 GC 13.6, 17.11, 16.2(a), 16.10	Buzzer Horn	3	Amber	GAS XXX	xxx Gas abbreviation may be indicated.
Power-operated sliding watertight door fault alarm		SOLAS II-1/13.6.3 II-1/13.6.8	Horn Buzzer	3	Amber	No symbol allocated	Horn in machinery space, buzzer elsewhere.

* For use with visual indicator columns (see appendix).

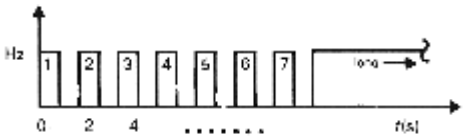
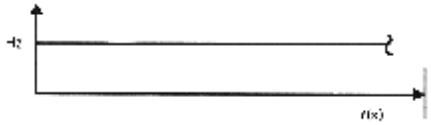
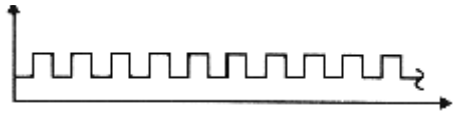
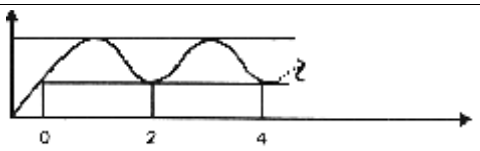
Table 7.1.3 – Call signals

(Note: See table 7.2 for audible signals.)

Function	IMO Instrument	Audible		Visual*		Remarks
		Device	Code	Colour	Symbol*	
Telephone	SOLAS II-1/50	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	Horn Bell Buzzer	2, 3.a	White		Horn/bell in machinery space, buzzer/bell in engine control room and on navigation bridge.

* For use with visual indicator columns (see appendix).

Table 7.2 – Audible signals and call waveforms

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

8 REQUIREMENTS FOR PARTICULAR ALARMS

8.1 Personnel alarm

8.1.1 The personnel alarm should 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 period satisfactory to the Administration, this should be in a period not exceeding 30 min.

8.1.2 A pre-warning signal should be provided in the machinery spaces which operates 3 min before the alarm required by 8.1.1 is given.

8.1.3 The alarm system should 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.

8.1.4 The alarm system should be disconnected by the engineer on duty after leaving the machinery spaces. When the system is brought into operation in accordance with 8.1.3.1, disconnection should not be possible before the engineer has acknowledged the alarm in the machinery spaces.

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

8.2 Bridge Navigational Watch Alarm Systems (BNWAS)

BNWAS should conform to resolution MSC.128(75) on Performance Standards for a Bridge Navigational Watch Alarm System.

8.3 Engineers' alarm

In addition to manual operation from the machinery space, the engineers' alarm on ships with periodically unattended machinery spaces should 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.

8.4 General emergency alarm

8.4.1 Performance standards and functional requirements are provided in the LSA Code, chapter VII, section 7.2. The general emergency alarm system should be capable of being operated from the navigation bridge and other strategic points. For passenger ships there should also 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 should normally be regarded as strategic points.

8.4.2 The system should 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.

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

9 GROUPING AND AGGREGATION OF ALERTS AND INDICATORS

9.1 Grouping and aggregation should not conceal necessary information from the personnel responsible for the safe operation of the ship.

9.2 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, should be arranged in groups, as far as practicable.

9.3 The scope of alerts and indicators will vary with the type of ship and machinery. The basic recommendations given in tables 9.1 to 9.3 should be adhered to.

9.4 Where visual alerts are grouped or aggregated in accordance with 3.10 and 3.11, individual visual alerts should be provided at the appropriate position to identify the specific alert condition.

9.5 The purpose of grouping and aggregation is to achieve the following:

.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.

Table 9.1 – Grouping/aggregation of alerts and indicators: machinery space attended, remote control of the main propulsion machinery from the navigation bridge not provided

Navigation bridge[2]		**Machinery space**
One common audible alert device, except emergency alarms (e.g. buzzer, continuous)		Audible alert devices, in accordance with sections 5, 7 and 9
1	2	3
Workstation for navigating and manoeuvring on navigation bridge	Other locations on navigation bridge	Machinery space or control room/station
Individual visual alerts and indicators for: Each required steering gear: - Power unit power failure - Control system power failure - Hydraulic fluid level alarm - Running indication - Alarm system failure alarm Engine-room telegraph Rudder angle indicator Propeller speed/direction/pitch Telephone call	Visual alerts and indicators at any position on the navigation bridge other than the workstation for navigating and manoeuvring for: Required alerts and indicators, as indicated under "Notes" in table 10.1.1 Any non-required alert or indicator which the Administration considers necessary for the officer on watch Fire detection alarm	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 should be taken of 9.5.3 Alerts and indicators as indicated under "Notes" in table 10.1.2 Engine-room telegraph

[2] and/or ship safety centre on passenger ships.

Table 9.2 – Grouping/aggregation of alerts and indicators: machinery space attended, remote control of the main propulsion machinery from the navigation bridge provided

Navigation bridge[2]		**Machinery space**
One common audible alert device, except emergency alerts (e.g. buzzer, continuous)		Audible alert devices, in accordance with sections 3, 5 and 7
1	2	3
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 9.1, plus: Threshold alarm for imminent slowdown or shutdown of propulsion system Failure of remote control for main propulsion machinery Starting air low pressure, when the engine can be started from the navigation bridge 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 9.1, plus: Machinery alarm, if provided	Visual Alerts and indicators as in column 3 of table 9.1, 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 10.1.2

Table 9.3 – Grouping/aggregation of alerts and indicators: machinery space unattended, remote control of the main propulsion machinery from the navigation bridge provided

Navigation bridge[3]		**Machinery space**	**Accommodation**
One common audible alert device, except emergency alarms (e.g. buzzer, continuous)		Audible alert devices, in accordance with sections 3, 5 and 7	
1	2	3	4
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 tables 9.1 and 9.2, 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 tables 9.1 and 9.2, 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 10.1.1	As in column 3 of tables 9.1 and 9.2, plus: Alerts as indicated under "Notes" in table 10.1.2 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 10.1.5

* Alarm may be common.

[3] and/or ship safety centre on passenger ships.

10 ALERT AND INDICATOR LOCATIONS

10.1 Required alert and indicator type and location should be in accordance with tables 10.1.1 to 10.1.9.

10.2 Applicable regulations in the IMO instruments referred to should be consulted for additional requirements.

Notes to be applied to tables 10.1.1 to 10.1.9:

(1) Abbreviation for priorities and indicators:
EM – emergency alarm
A – alarm
W – warning
C – caution
I – indication/indicator

Abbreviation for presentation:
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

(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 should 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 should 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. (AU, V).

Table 10.1.1 – Location: navigation bridge

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
29.11	Rudder angle indicator	I	MI	Column 1, table 9.1
29.5.2	Steering gear power unit power failure	A	AU,V	Ditto
29.8.4	Steering control system power failure	A	AU,V	Ditto
29.12.2	Low steering gear hydraulic fluid level	A	AU,V	Ditto
30.1	Steering gear running	I	VI	Ditto
30.3	Steering system electric phase failure/ overload	A	AU,V	Column 1, table 9.3
31.2.7, 49.5	Propulsion machinery remote control failure	A	AU,V	Column 1, table 9.2, 9.3
31.2.9, 49.7	Low propulsion starting air pressure	A	AU,V	Ditto
31.2.10	Imminent slowdown or shutdown of propulsion system	A	AU,V	Column 1, table 9.2
52	Automatic propulsion shutdown override	I	VI	Column 1, table 9.3
52	Automatic shutdown of propulsion machinery	A	AU,V	Ditto
51.1.3	Fault requiring action by or attention of the officer on watch	A	AU,V	Column 2, table 9.3 (machinery alarm including 53.4.2 and 53.4.3).
31.2.8	Propeller speed/direction/pitch	I	MI	Column 1, table 9.2
49.6	Propeller speed/direction/pitch	I	MI	Column 1, table 9.3
37	Engine-room telegraph	I	VI	Column 1, table 9.1
13.6.1.4,13.7.2, 13.7.3, 13-1.2, 13-1.3, 14.2,15-1.2	Watertight door position	I	VI	Column 2, table 9.1
13.6.3.1	Watertight door low hydraulic fluid level	A	AU,V	Ditto
13.6.3.1 13.6.3.2	Watertight door low gas pressure, loss of stored energy	A	AU,V	Ditto
13.6.8	Watertight door electrical power loss	A	AU,V	Ditto
35-1.2.6.2	High water level alarm	A	AU	!, where required
17-1.1.2, 17-1.1.3	Access open/close indicators	A	AU,V,VI	Column 2, table 9.1
17-1.2	Non closure of shell doors	I	VI	Column 2, table 9.1. Passenger ships with ro-ro cargo spaces or special category spaces.
17-1.3	Water leakage detection indicator	I	VI	Column 2, table 9.1. Passenger ships with ro-ro cargo spaces or special category spaces.
25.3	Water level pre-alarm	A	AU,V	Column 2, table 9.1. Single hold cargo ships other than bulk carriers. For details see resolution MSC.188(79) as amended
25.3	Water level main-alarm	EM	AU,V	Ditto
31.2.5, 49.3	Propulsion control station in control	I	VI	Column 1, table 9.2
51.2.2	Alarm system normal power supply failure	A	AU,V	Column 2, table 9.3

IMO Instrument	Function	Priority	Display	Notes
13-1.2	Closure of doors provided to ensure the watertight integrity	A	AU	Column 2 table 9.1
17-1.2	Shell doors, loading doors and other closing appliances not fully closed	A	AU,V	Column 2 table 9.1
17-1.2	Alarm when ship leaves harbour with bow doors, inner doors, stern ramp or side shell doors are open or any closing device not in the correct position	A	AU	Column 2 table 9.1
25-1.2.1	Water level pre-alarm	A	AU, V	Column 2, table 9.1. Multiple hold cargo ships other than bulk carriers and tankers. For details see resolution MSC.188(79) as amended.
25-1.2.1	Water level main-alarm	EM	AU, V	Column 2, table 9.1. Multiple hold cargo ships other than bulk carriers and tankers. For details see resolution MSC.188(79) as amended.
25-1.3.2	Bilge sensor	A	AU, V	Column 2, table 9.1. Multiple hold cargo ships other than bulk carriers and tankers. For details see resolution MSC.188(79) as amended.
SOLAS II-2				
4.5.10.1.3	Hydrocarbon gas detection in tanker cargo pump rooms	A	AU,V	Column 2, table 9.1
7.4.1, 7.4.2	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU,V	Column 2, table 9.3
20.3.1.3	Loss of required ventilation	A	AU,V	Column 2, table 9.1
9.4.1.1.5.6, 9.6.2	Fire door closure	I	VI	Ditto
10.5.6.4	Fixed local application fire-extinguishing system activation	A,	AU,V; VI	Column 2, table 9.1. Indication of the activated zone
9.4.1.1.5.10	Release of remote released sliding or power operated door	A	AU	Column 2, table 9.1
10.6.4.4	Operation of the fire-extinguishing system in the galley	A	AU	Column 2, table 9.1
SOLAS III				
16.9	Position of stabilizer wings	I	VI	Column 2, table 9.1
SOLAS V				
19.2.5.4	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 9.1
19.2.9.1	Rate-of-turn indicator	I	VI	Column 2, table 9.1
19.2.3.4,19.2.8, 19.2.9.2	Speed and distance measuring device	I	MI	Column 2, table 9.1
19.6	Failure of subsystem of Integrated bridge system	A	AU, V	Column 2, table 9.2

IMO Instrument	Function	Priority	Display	Notes
SOLAS XII				
12.2	Water level pre-alarm	A	AU,V	Column 2, table 9.1. Bulk carriers and single hold cargo ships other than bulk carriers. For details see resolution MSC.188(79) as amended.
12.2	Water level main-alarm	EM	AU,V	Ditto
9.2	Bilge well high water level alarms	A	AU, V	Column 2, table 9.1 For bulk carriers constructed before 1 July 1999
Present Code				
3.3.7 and 8.1 of the present Code	Personnel alarm	A	AU,V	Column 2, table 9.1
Resolution MSC.128(75), Annex				
4.1.2.2, 5.2.2	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.
4.1.2.3, 5.2.3	BNWAS first stage audible alarm	A	AU	Tone/modulation characteristics and volume level should be adjustable during the commissioning.
4.4.1	Malfunction of, or power supply failure to, the BNWAS	W	AU,V	
Gas or chemical codes				Column 2, table 9.1 for the following:
IBC 15.2.4 BCH 4.19.4	High and low temperature of cargo and high temperature of heat-exchanging medium	A	AU,V	Ammonium nitrate solution
IBC 15.5.1.6 BCH 4.20.6	High temperature in tanks	A	AU,V,MI	Hydrogen peroxide solution over 60% but not over 70%
IBC 15.5.1.7 BCH 4.20.7	Oxygen concentration in void spaces	A	AU,V,MI	Hydrogen peroxide solution over 60% but not over 70%
IBC 15.8.23.1 BCH 4.7.15(a)	Malfunctioning of temperature controls of cooling systems	A	(AU,V)	!, Propylene oxide
2014 IGC 13.4.2 GC 13.4.1	High and low pressure in cargo tank	A	AU,V	High and low pressure alarms
2014 IGC 13.6.13 GC 13.6.4, 17.11.1	Gas detection equipment	A	AU,V	
2014 IGC 13.7.2.2 GC 13.5.2	Hull or insulation temperature	A;	AU, (V), MI	!
2014 IGC 17.16.4.4 GC 17.12.2(d)(iv)	Cargo high pressure, or high temperature at discharge of compressors	A	AU,V	Methylacetylene-propadiene mixtures
2014 IGC 17.13.4.3 GC 17.12.5(d)(iii)	Gas detecting system monitoring chlorine concentration	A	AU,V	!
2014 IGC 17.13.1.4 GC 17.12.5(d)(iv)	High pressure in chlorine cargo tank	A	AU, (V)	!
IBC 15.5.2.5 BCH 4.20.19	High temperature in tanks	A	AU,V,MI	Hydrogen peroxide solution over 8% but not over 60%

IMO Instrument	Function	Priority	Display	Notes
IBC 15.5.2.6 BCH 4.20.20	Oxygen concentration in void spaces	A	AU,V,MI	Ditto
IBC 15.10.2 BCH 4.3.1(b)	Failure of mechanical ventilation of cargo tanks	A	(AU,V)	!, Sulphur (molten)
2014 IGC 5.2.2.4, GC 5.2.5(b)	Liquid cargo in the ventilation system	A	(AU,V)	
2014 IGC 8.3.1.1, GC 8.4.2(a)	Vacuum protection of cargo tanks	A	(AU,V)	!
2014 IGC 9.5.2, GC 9.5.2	Inert gas pressure monitoring	A	(AU,V)	!
2014 IGC 13.6.13 GC 13.6.11	Gas detection equipment	A	AU,V	!
2014 IGC 17.14.1.4 GC 17.12.5(a)(iv)	Gas detection after bursting disk for chlorine	A	(AU,V)	!
2014 IGC 17.21.4	Cargo tank low pressure alarm for carbon dioxide	A	AU, V, MI	
SFV Protocol 1993 ***Chapter IV***				
4(5), 8(1)(e)(iii)	Machinery automatic shut-off advance alarm	A	AU,V	Column 1, table 9.3 Column 2, table 9.2
6(2)	Oil-fired steam boiler low water level, air supply failure or flame failure	A	AU,V	!, Column 2, table 9.3 II-1/32.2*
8(1)(d)	Propulsion control station in control	I	VI	Column 1, table 9.2 II-1/31.2.5; II-1/49.3*
8(1)(e)(i), 8(1)(e)(ii)	Propeller speed/direction/pitch	I	MI	Column 1, table 9.2 II-1/31.2.8*
8(1)(g)	Propulsion machinery remote control failure	A	AU,V	Column 1, table 9.2 II-1/31.2.7*
8(1)(h)	Low propulsion starting air pressure	A	A,UV	!, Column 1, table 9.2 II-1/31.2.9*
13(3)	Rudder angle indicator	I	MI	Column 1, table 9.1 II-1/29.11*
13(4)	Steering gear power unit power failure	A	AU,V	Column 1, table 9.1 II-1/29.5.2*
13(5)	Steering gear running	I	VI	Column 1, table 9.1 II-1/30.1*
13(5)	Steering gear overload/no volts	A	AU,V	Column 1, table 9.1 II-1/30.3*
15(5)	Refrigerating machinery spaces and refrigerating rooms alarm	A	AU,V	Column 2, table 9.1
19(1)	High pressure fuel oil pipe leakage	A	AU,V	!, Column 2, table 9.3
19(3)	Fuel heating high temperature alarm	A	AU,V	!, Column 2, table 9.3
19(5)	Fire detection alarm	A	AU,V	!, Column 2, table 9.3
20(1)	Bilge high water level alarm	A	AU,V	Column 2, table 9.3 II-1/35-1.2.6.2*
22(2)(a)	Essential and important machinery parameters	A	AU,V	Column 2, table 9.3 II-1/51.1.1
22(2)(d)	Fault requiring action by or attention of the officer on watch	A	AU,V	Column 2, table 9.3 (machinery alarm including 22(2)(c), 23(2), 23(3)(c) and 23(3)(d)) II-1/51.1.3*
22(3)(b)	Alarm system normal power supply failure	A	AU,V	Column 2, table 9.3 II-1/51.2.2*

IMO Instrument	Function	Priority	Display	Notes
24	Automatic propulsion shutdown override	I	VI	Column 1, table 9.3 II-1/52*
24	Automatic shutdown of propulsion machinery	A	AU,V	Column 1, table 9.3 II-1/52*
Chapter V				
14(2)(b)	Fire detection or automatic sprinkler operation	A	AU,V	Column 2, table 9.1 II-2/7, II-2/10*
15(2)(b)	Fire detection alarm	A	AU,V	Column 2, table 9.1 II-2/7*
Chapter X				
3(11)	Speed and distance indicator	I	VI	
3(12)	Indicator for rudder angle, the rate of revolution of each propeller and pitch and operational mode of variable pitch propellers or lateral thrust propellers	I	VI	
IGS				
3.14.11	Low water level alarm	A	AU,V	
MARPOL 73/78 Annex I				
28(3.1)	Hinged watertight access doors with open/closed indicator	I	VI	!
2000 HSC Code				
7.7.1	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 9.2
7.7.1	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 9.2
7.7.1.1.2	Fixed fire detection and fire alarm systems' power loss or fault condition	A	AU,V	+,Column 2, table 9.2
7.7.1.1.4	Fire detection signal	A	AU	+,Column 2, table 9.2
7.7.1.1.6	Fire detection manually operated call point section unit indicator	A	AU,V	Column 2, table 9.3 At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times
7.7.2.1	Fire detection for periodically unattended machinery spaces	A	AU,V	Column 2, table 9.3 II-2/7.4.2*
7.8.1.3	Fire door position	I	VI	Column 2, table 9.2 II-2/9.6.2*
7.8.5.3	Loss of required ventilation	A	AU,V	Column 2, table 9.2 II-2/20.3.1.3*
7.9.3.3.3	Fire door closing	I	VI	!, Column 2, table 9.2 II-2/9.6.2*
7.13.1	Manually operated sprinkler system alarms	A	AU,V	!, Column 2, table 9.2
7.15	Smoke detection system for cargo spaces	I	VI	!, Column 2, table 9.2
9.1.14	Liquid cooling system failure	A	AU,V	!
9.2.1	Automatic fire detection system	A	AU,V	Column 2, table 9.3 II-2/7.4.1.2; 7.4.2*

IMO Instrument	Function	Priority	Display	Notes
9.2.1	Bilge alarm	A	AU,V	Column 2, table 9.3 II-1/48.1; 48.2*
9.2.1	Remote machinery alarm system	A	AU,V	Column 2, table 9.3
9.4.2	Fuel line failure	A	AU,V	Column 2, table 9.2
9.4.5	Lubricating oil pressure or level falling below a safe level	A	AU,V	Column 2, table 9.2
9.5.6	Lubricating fluid supply failure or lubrication fluid pressure loss	A	AU,V	Column 2, table 9.2
10.3.12	Unattended space bilge alarm	A	AU,V	!, Column 2, table 9.2 II-1/48.1*
11.2.1	Failure of any remote or automatic control system	A	AU,V	Column 2, table 9.3
11.4.1	Malfunction or unsafe condition	A	AU,V	!, Column 2, table 9.2
11.4.1.1	Indication of conditions requiring immediate action	EM	AU,V	Column 2, table 9.2; distinctive alarms in full view of crew members
11.4.1.2	Indication of conditions requiring action to prevent degradation to an unsafe condition	C	V	Column 2, table 9.2; visual display to be distinct from that of alarms referred to in 11.4.1.1
12.3.9	Emergency battery discharge	I	VI	Column 2, table 9.2 II-1/42.5.3; II-1/43.5.3*
12.5.1	Steering system electric overload	A	AU,V	!, Column 2, table 9.2 II-1/30.3*
12.5.2	Steering system electric phase failure	A	AU,V	Column 2, table 9.2 II-1/30.3*
12.6.3	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 2, table 9.2 II-1/45.4.2*
13.7	Rudder angle indicator and rate-of-turn indicator	I	VI	Column 2, table 9.2 5.4.3 II-1/29.11*, V/19.2.5.4*
13.11.2	Propulsion indicator	I	VI	Column 2, table 9.2
13.11.3	Emergency steering position compass reading indicator	I	VI	Column 2, table 9.2
2.2.2.4	Watertight door position	I	VI	Column 2, table 9.1
2.2.2.6	Watertight door remote closing	A	AU, V	Column 1, table 9.1 II-1/13.6.1.6*
2.2.4.4	Access open/close indicator	A	AU, V, VI	Column 2, table 9.1 II-1/17-1.1.2
2.2.5.1	Shell doors, loading doors and other closing appliances not fully closed	A	AU, V, VI	Column 2, table 9.1 II-1/17-1.2*
2.2.5.1	Alarm when craft leaves harbour with bow doors, inner doors, stern ramp or side shell doors is open or any closing device not in the correct position	A	AU	Column 2, table 9.1 II-1/17-1.2*
2.2.5.2	Water leakage detection indicator	A	AU, V	Column 2, table 9.1 II-1/17-1.3*
13.3.1	Speed and distance measuring device	I	MI	V/19.2.3.4*

IMO Instrument	Function	Priority	Display	Notes
2009 MODU Code				
7.4.1	Propeller pitch indicator	I	VI	Column 2, table 9.1
7.4.2.5, 8.5.5	Propulsion station in control indication	I	VI	Columns table 9.2, table 9.3 II-1/31.2.5; II-1/49.3*
7.4.2.7, 8.5.7	Propulsion machinery remote control failure	A	AU,V	Column 1, table 9.2, table 9.3 II-1/31.2.7; II-1/49.5*
7.4.2.8	Propeller speed/direction/pitch	I	MI	Column 1, table 9.2 II-1/31.2.8*
7.4.2.9, 8.5.9	Low starting air pressure	A	AU,V	Columns 1 table 9.2, table 9.3 II-1/31.2.9; II-1/49.7*
7.4.2.10	Imminent slowdown or shutdown of the propulsion	A	AU, V	Column 1, table 9.2 II-1/31.2.10*
7.5.15	Rudder angle indicator	I	MI	Column 1, table 9.1 II-1/29.11*
7.6.1	Steering gear running	I	VI	Columns, table 9.1 II-1/30.1*
7.6.3	Steering gear phase failure/overload alarm	A	AU,V	Column 1, table 9.3 II-1/30.3*
8.5.8	Propeller speed/direction/pitch	I	MI	Column 1, table 9.3 II-1/49.6*
8.7.1	Fault requiring attention	A	AU,V	Column 2, table 9.3, including 8.3.5.1, 8.4.1, 8.4.3,8.8.5 and 8.9 II-1/51.1.3*
8.7.3	Alarm system normal supply failure	A	AU,V	Column 2, table 9.3 II-1/51.2.2*
9.11.1	Fire detection system alarm	A	AU,V	Column 2, table 9.1
9.12.1	Gas detection and alarm system	A	AU,V	!, Column 2, table 9.1
7.7	Orders from the navigating bridge to the machinery space or control room	I	VI	
8.9	Automatic propulsion shutdown override	I	VI	
9.11.3	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	II-2/7.4.1*
9.13.1	Hydrogen sulphide detection and alarm system	A	AU, V	
FSS Code				
+8.2.5.2.1, +9.2.5.1.2, 9.2.5.1.3	Fire detection or automatic sprinkler operation	A	AU, V	Column 2, table 9.1
+8.2.5.2.1, +9.2.5.1.5, +9.2.5.1.2	Fire detection system fault	A	AU, V	Ditto
10.2.4.1.4	Smoke detection system power loss	A	AU, V	Ditto
+10.2.4.1.1 +10.2.4.1.2	Detection of smoke or other products of combustion	A I	A, V, VI	Ditto
15.2.2.4.4.1	Inert gas supply main pressure	I	MI	Ditto; forward of non-return devices.
15.2.2.4.4.1	Inert gas pressure	I	MI	Column 2, table 9.1. In slop tanks of combination carriers.
16.2.2.3.3	Vapour concentration reaching a preset value	A	AU, V	

IMO Instrument	Function	Priority	Display	Notes
IGF Code				
6.14.2	Inert gas pressure monitoring	A	(AU, V)	
10.3.2.2 10.3.4.2 (Part 15, Table 1)	Manually activated emergency shutdown of engine	A	(AU, V)	
11.7.1 (Part 15, Table 1)	Fixed fire detection and fire alarm system	A	(AU, V)	In fuel storage hold spaces, ventilation trunk to the tank connection space, in the tank connection space and for all other rooms of the fuel gas system where fire cannot be excluded.
14.3.7	Automatic shutdown of the motors in the event of low-low liquid level	A	AU, V	
15.3.2	High level in the bilge well	A	(AU, V)	
15.4.2.1	High liquid level alarm	A	AU, V	Giving an audible and visual warning when activated
15.4.2.5	Overflow control override operation indicator	I	VI	
15.4.3	Direct reading gauge	I	VI	
15.4.5	High- and low-pressure alarm	A	(AU, V)	
15.4.10	Automatic shutdown of the motors	A	AU, V	
15.6.1	Gas compressor low gas input pressure, low gas output pressure, high gas output pressure and operation	A	AU, V	
15.6.2	Temperature monitor for the bulkhead shaft glands and bearings	A	AU, V	
15.7.1	Operation of the engine in case of gas-only engines	I	VI	
15.7.2	Operation and mode of operation of the engine in the case of dual fuel engines	I	VI	
15.8.1.1 15.8.6	Gas detection in tank connection space at 20% LEL	A	AU, V	
15.8.1.1 15.8.6	Gas detection on two detectors in tank connection space at 40% LEL	A	AU, V	
15.8.7	Gas detection in ventilated duct around gas pipes in the machinery space at 30% LEL	A	AU, V	
15.8.7	Gas detection on two detectors in ventilated duct around gas pipes in the machinery space at 60% LEL	A	AU, V	
Part 15, Table 1	Bilge well high level in tank connection space	A	(AU, V)	
Part 15, Table 1	Bilge well low temperature in tank connection space	A	(AU, V)	
15.8.1.1 Part 15, Table 1	Gas detection in duct between tank and machinery space containing gas-fuelled engines at 20% LEL	A	(AU, V)	
15.8.1.1 Part 15, Table 1	Gas detection on two detectors in duct between tank and machinery space containing gas-fuelled engines at 40% LEL	A	(AU, V)	
15.8.1.4 Part 15, Table 1	Gas detection in fuel preparation room at 20% LEL	A	(AU, V)	
15.8.1.4 Part 15, Table 1	Gas detection on two detectors in fuel preparation room at 40% LEL	A	(AU, V)	

IMO Instrument	Function	Priority	Display	Notes
15.8.1.2	Gas detection in all ducts around fuel pipes;	A	(AU, V)	
15.8.1.3	Gas detection in Machinery spaces containing gas piping, gas equipment or gas consumers;	A	(AU, V)	
15.8.1.4	Gas detection in Compressor rooms	A	(AU, V)	
15.8.1.5	Gas detection in other enclosed spaces containing fuel piping or other fuel equipment without ducting;	A	(AU, V)	
15.8.1.6	Gas detection in other enclosed or semi-enclosed spaces where fuel vapours may accumulate including inter-barrier spaces and fuel storage hold spaces of independent tanks other than type C;	A	(AU, V)	
15.8.1.7	Gas detection in airlocks	A	(AU, V)	
15.8.1.8	Gas heating circuit expansion tanks;	A	(AU, V)	
15.8.1.9	Gas detection in motor rooms associated with the fuel systems;	A	(AU, V)	
15.8.1.10	Gas detection in ventilation inlets to accommodation and machinery spaces if required based on the risk assessment required in 4.2.	A	(AU, V)	
15.8.2 (Part 15, Table 1)	Gas detection in ESD protected machinery space containing gas-fuelled engines at 20% LEL	A	(AU, V)	
15.8.2 (Part 15, Table 1)	Gas detection on two detectors in ESD protected machinery space containing gas-fuelled engines at 40% LEL	A	(AU, V)	
15.9 (Part 15, Table 1)	Gas detection in duct inside machinery space containing gas-fuelled engines at 30% LEL	A	(AU, V)	
15.9 (Part 15, Table 1)	Gas detection on two detectors in duct inside machinery space containing gas-fuelled engines at 60% LEL	A	(AU, V)	
15.10.1 (Part 15, Table 1)	Loss of ventilation in duct between tank and machinery space containing gas-fuelled engines	A	(AU, V)	
15.10.1 (Part 15, Table 1)	Loss of ventilation in duct inside machinery space containing gas-fuelled engines	A	(AU, V)	
15.10.2 (Part 15, Table 1)	Loss of ventilation in ESD protected machinery space containing gas-fuelled engines	A	(AU, V)	
Part 15, Table 1	Abnormal gas pressure in gas supply pipe	A	(AU, V)	
Part 15, Table 1	Failure of valve control actuating medium	A	(AU, V)	
ISPS Code				
9.43	Automatic intrusion-detection device	A	AU, V	
IP Code ***Part II***				
6.2.2	Safe operation of periodically unattended machinery space	A	AU, V	
8.2.4	Emergency communication to all persons on board	A	AU, V	

* Cross-reference to SOLAS regulation.
\+ These alarms may be omitted if they are provided at the central fire control station.
! No location specified in other IMO instruments. Location is recommended.

Table 10.1.2 – Location: machinery space/machinery control room

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
29.12.2	Low steering gear fluid level	A	AU,V	Column 3, table 9.1
30.1	Steering gear running	I	VI	Ditto
30.3	Steering system electric phase failure or overload	A	AU,V	Ditto
31.2.7, 49.5	Propulsion machinery remote control failure	A	AU,V	Column 3, tables 9.2 and 9.3
31.2.9, 49.7	Low propulsion starting air pressure	A	AU,V	Ditto
32.2	Oil-fired boiler low water level, air supply failure, or flame failure	A	AU,V	Column 3, table 9.1
32.3	Propulsion boiler high water level	A	AU,V	Ditto
31.2.5, 49.3	Propulsion control station in control	I	VI	Column 3, table 9.2
37	Engine-room telegraph	I	VI	Column 3, table 9.1
31.2.4, 49.2	Propulsion machinery orders from bridge	I	VI	Column 3, table 9.2
47.1.1, 47.1.2	Boiler and propulsion machinery internal fire	A	AU,V	Column 3, table 9.3
47.2	Internal-combustion engine monitors	I	MI	Ditto
48.1, 48.2	Bilge monitors	A	AU,V	Ditto
51.2.2	Alarm system normal power supply failure	A	AU,V	Ditto
53.4.3, 51.1.1	Essential and important machinery parameters	A	AU,V	Column 3, table 9.3 (machinery alarm)
42.5.3, 43.5.3	Emergency battery discharge	I	VI	Column 3, table 9.1
52	Automatic shutdown of propulsion machinery	A	AU,V	Column 3, table 9.3
52	Automatic propulsion shutdown override	I	VI	Ditto
53.4.2	Automatic change-over of propulsion auxiliaries	A	AU,V	Ditto
45.4.2	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 3, table 9.1
SOLAS II-2				
7.4.1, 7.4.2	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU,V	Column 3, table 9.2
4.2.2.5.2	High-pressure fuel oil leakage	A	AU,V	Column 3, table 9.3
4.2.5.2	Service fuel oil tank high temperature	A	AU,V	Ditto
4.5.10.1.3	Hydrocarbon gas detection in tankers cargo pump rooms	A	AU,V	Column 3, table 9.1
10.5.6.4	Fixed local application fire-extinguishing system activation	A I	AU,V, VI	Column 3, table 9.1 Indication of the activated zone
Gas or chemical codes				
GC 16.2(a)	Loss of inert gas pressure between pipes	A	AU,V	!, Column 3, table 9.1
2014 IGC 16.4.8 GC 16.10	Cargo gas/fuel system gas detection	A	AU,V	!, Ditto
GC 16.2(b)	Flammable gas in ventilation duct	A	(AU,V)	!, Ditto
GC 16.5	Flammable gas in ventilation casing	A	(AU,V)	!, Ditto
2014 IGC 16.4.2	Leak in piping system in the enclosed spaces	A	AU, V	!, Column 3, table 9.1

IMO Instrument	Function	Priority	Display	Notes
2014 IGC 16.5.1	Gas detection system	A	AU, V	!, Column 3, table 9.1 All equipment (heaters, compressors, vaporizers, filters, etc.) in an enclosed space.
2014 IGC 16.5.3	Cargo/cargo vapour in the Heating and cooling mediums	A	AU, V	!, Column 3, table 9.1
2014 IGC 16.6.3.4	Automatic fuel changeover system	A	AU, V	!, Column 3, table 9.1
2014 IGC 16.7.3.3	Gas detection system	A	AU, V	!, Column 3, table 9.1 For crankcases, sumps, scavenge spaces and cooling system vents.
2014 IGC 16.7.3.5, 16.8.3.1	Poor combustion or misfiring detection	I	MI	
Present Code				
3.3.7 and 8.1	Personnel alarm	A	AU,V	Column 3, table 9.1
SFV Protocol 1993 *Chapter IV*				
6(2)	Oil-fired steam boiler low water level, air supply failure or flame failure	A	AU,V	Column 3, table 9.1 II-1/32.2*
8(1)(e)(iii) 4(5)	Machinery failure advance alarm	A	AU,V	Column 3, table 9.2
8(1)(d)	Propulsion control station in control	I	VI	Column 3, table 9.2 II-1/31.2.5; 49.3*
8(1)(g)	Propulsion machinery remote control failure	A	AU,V	!, Column 3, table 9.2 II-1/31.2.7*
8(1)(h)	Low propulsion starting air pressure	A	AU,V	!, Column 3, table 9.2 II-1/31.2.9*
15(4)(b)	Refrigerant leak alarm	A	AU,V	
17(6)	Emergency battery discharge	I	VI	!, Column 3, table 9.1 II-1/42.5.3*
18(4)(b)	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 3, table 9.1 II-1/45.4.2*
19(7)	Internal-combustion engine monitors	I	MI	Column 3, table 9.3 II-1.47.2*
22(2)(a)	Essential and important machinery parameters	A	AU,V	Column 3, table 9.3 II-1/51.1.1*
22(3)(b)	Alarm system normal power supply failure	A	AU,V	Column 3, table 9.3 II-1/51.1.1*
23(2)	Automatic change-over of propulsion auxiliaries	A	AU,V	Column 3, table 9.3 II-1/53.4.2*
24	Automatic shutdown of propulsion machinery	A	AU,V	Column 3, table 9.3 II-1/52*
24	Automatic propulsion shutdown override	I	VI	Column 3, table 9.3 II-1/52*
IGS				
3.14.11	Low water level alarm	A	AU,V	Column 3, table 9.1
MARPOL 73/78 Annex I				
14(7)	Alarm for excessive oil content in oily mixture discharge into the sea	A	(AU,V)	!

IMO Instrument	Function	Priority	Display	Notes
2000 HSC Code				
7.7.1.1.4	Fire detection signal	A	AU,V	Column 3, table 9.2
7.7.2.1	Fire detection for periodically unattended machinery spaces	A	AU,V	Column 3, table 9.3 II-2/7.4.2*
9.2.1	Automatic fire detection system	A	AU,V	Column 3, table 9.3 II-2/7.4.1.2; 7.4.2*
9.2.1	Bilge alarm	A	AU,V	Column 3, table 9.3 II-1/48.1; 48.2*
9.2.1	Remote machinery alarm system	A	AU,V	Column 3, table 9.3
9.4.2	Fuel line failure	A	AU,V	Column 3, table 9.2
9.4.5	Lubricating oil pressure or level falling below a safe level	A	AU,V	Column 3, table 9.2
9.5.6	Lubricating fluid supply failure or lubrication fluid pressure loss	A	AU,V	Column 3, table 9.2
10.2.7.3	High temperature alarm (oil fuel or settling tank)	A	AU, V	Column 3, table 9.3 II-2/4.2.5.2*
10.3.12	Unattended space bilge alarm	A	AU, V	!, Column 3, table 9.2, II-1/48.1*
11.2.1	Failure of any remote or automatic control system	A	AU,V	Column 3, table 9.3
11.4.1	Malfunction or unsafe condition	A	AU,V	Column 3, table 9.2
11.4.1.3	Indication of conditions in 11.4.1.1 requiring immediate action	EM	AU,V	Column 3, table 9.2
11.4.1.3	Indication of conditions in 11.4.1.2 requiring action to prevent degradation to an unsafe condition	A C	AU,V	Column 3, table 9.2; visual display to be distinct from that of alarms referred to in 11.4.1.1
11.5	Shutdown system activation	A	AU,V	!, Column 3, table 9.2
12.5.1	Steering system electric overload	A	AU,V	!, Column 3, table 9.2 II-1/30.3*
12.5.2	Steering system electric phase failure	A	AU,V	Column 3, table 9.2, II-1/30.3*
12.6.3	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 3, table 9.2 II-1/45.4.2*
2009 MODU Code				
4.3.7	Machinery failure pre-alarm	A	AU,V	!, Column 3, table 9.1
4.6.2	Manual overriding of the automatic control indicator	I	VI	Column 3, table 9.1
5.4.12	Emergency battery discharge	I	VI	Column 3, table 9.1 II-1/42.5.3*
5.6.7	Electrical distribution system low insulation level	A or I	AU or VI	!, Column 3, table 9.1 II-1/45.4.2*
7.3.1	Water tube boiler high water level alarm	A	AU,V	Column 3, table 9.1
7.4.2.4, 8.5.4	Propulsion machinery orders from bridge	I	VI	Column 3, table 9.2 II-1/31.2.4; 49.2*
7.4.2.5, 8.5.5	Propulsion station in control indication	I	VI	Columns 1 and 3, table 9.2 II-1/31.2.5; 49.3*
7.4.2.9	Low starting air pressure	A	AU,V	Columns 1 and 3, table 9.2 II-1/31.2.9*
7.4.2.10	Imminent slowdown or shutdown of the propulsion system	A	AU, V	Column 1, table 9.2
7.6.1	Steering gear running	I	VI	Columns 1 & 3, table 9.1 II-1/30.1*
7.7	Orders from the navigating bridge to the machinery space or control room	I	VI	

IMO Instrument	Function	Priority	Display	Notes
8.3.1 4.8.7	High pressure fuel oil pipe leakage	A	AU,V	!, Column 3, table 9.3 II-2/4.2.2.5.2*
8.3.3	Fuel heating temperature alarm	A	AU,V	!, Column 3, table 9.3 II-2/4.2.5.2*
8.3.6	Fire detection alarm for boiler/propulsion machinery	A	AU,V	!, Column 3, table 9.3 II-1/47.1*
8.3.7	Internal-combustion engine monitors	I	MI	Column 3, table 9.3 II-1/47.2*
8.5.7	Propulsion machinery remote control failure	A	AU,V	Column 3, table 9.3 II-1/49.5*
8.7.1	Fault requiring attention	A	AU,V	At a normally manned control station in addition to main machinery control station including 8.3.5.1, 8.4.1, 8.4.3, 8.8.5 and 8.9 II-1/51.1*
8.8.2	Automatic change-over of propulsion auxiliaries	A	AU,V	Column 3, table 9.3 II-1/53.4.2*
8.9	Automatic propulsion shutdown override	I	VI	
9.11.3	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	II-2/7.4.1*
FSS Code				
15.2.2.4.5.1	All systems:			Column 3, table 9.1
15.2.2.4.5.1.1	- oxygen content	A	AU, V	
15.2.2.4.5.1.2	- indicating devices power supply failure	A	AU, V	
15.2.2.4.5.1.3 15.2.2.4.5.3	- low gas pressure	A	AU, V	
15.2.2.4.5.1.4	- high gas pressure	A	AU, V	
15.2.2.4.5.1.5	- automatic control system power supply failure	A	AU, V	
15.2.3.2.2	Flue gas and inert gas generator systems:			Column 3, table 9.1
15.2.3.2.2.1	- insufficient fuel oil supply	A	AU, V	
15.2.3.2.2.2	- generator power supply failure	A	AU, V	
15.2.3.2.2.3	- low water pressure or flow rate	A	AU, V	
15.2.3.2.2.4	- high water level	A	AU, V	
15.2.3.2.2.5	- high gas temperature	A	AU, V	
15.2.3.2.2.6	- blower failure	A	AU, V	
15.2.3.2.2.7 15.2.2.3.1.4	- water seal low level	A	AU, V	
15.2.4.2.2	Nitrogen generator systems:			Column 3, table 9.1
15.2.4.2.2.1	- electric heater failure	A	AU, V	
15.2.4.2.2.2	- low feed-air pressure or flow	A	AU, V	
15.2.4.2.2.3	- high-air temperature	A	AU, V	
15.2.4.2.2.4	- water separator high condensate level	A	AU, V	
15.2.2.4.4.2	Inert gas oxygen content	I	MI	Column 3, table 9.1
15.2.2.4.5.4	Oxygen level below 19%	A	AU, V	Column 3, table 9.1
IGF Code				
9.6.1.1	Loss of inert gas pressure between the pipes	A	(AU, V)	
10.4.9	Automatic fuel changeover system	A	(AU, V)	

IMO Instrument	Function	Priority	Display	Notes
15.6.1	Gas compressor low gas input pressure, low gas output pressure, high gas output pressure and operation	A	AU, V	
15.7.1	Operation of the engine in case of gas-only engines	I	VI	At the engine control room
15.7.2	Operation and mode of operation of the engine in the case of dual fuel engines	I	VI	At the engine control room
15.8.2 (Part 15, table 1)	Gas detection in ESD protected machinery space containing gas-fuelled engines at 20% LEL	A	(AU, V)	
15.8.2 (Part 15, table 1)	Gas detection on two detectors in ESD protected machinery space containing gas-fuelled engines at 40% LEL	A	(AU, V)	It shall also disconnect non certified safe electrical equipment in machinery space containing gas-fuelled engines
15.9 (Part 15, table 1)	Gas detection in duct inside machinery space containing gas-fuelled engines at 30% LEL	A	(AU, V)	If double pipe fitted in machinery space containing gas-fuelled engines
15.9 (Part 15, table 1)	Gas detection on two detectors in duct inside machinery space containing gas-fuelled engines at 60% LEL	A	(AU, V)	If double pipe fitted in machinery space containing gas-fuelled engines
15.10.1 (Part 15, table 1)	Loss of ventilation in duct between tank and machinery space containing gas-fuelled engines	A	(AU, V)	
15.10.1 (Part 15, table 1)	Loss of ventilation in duct inside machinery space containing gas-fuelled engines	A	(AU, V)	If double pipe fitted in machinery space containing gas-fuelled engines
15.10.2 (Part 15, table 1)	Loss of ventilation in ESD protected machinery space containing gas-fuelled engines	A	(AU, V)	
IP Code ***Part II***				
6.2.2	Safe operation of periodically unattended machinery space	A	AU, V	

* Cross-reference to SOLAS regulation.
! No location specified in other IMO instruments. Location is recommended.

Table 10.1.3 – Location: central fire control station where provided

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-2				
7.4.1, 7.4.2	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU,V	+
7.9.3	Fire detection alarms	A	AU, V	For passenger ships carrying more than 36 passengers only
7.9.3	Positions of fire doors and status of the detectors, alarms and fans	I	VI	For passenger ships carrying more than 36 passengers only
SFV Protocol 1993 ***Chapter V***				
14(3)(c)	Automatic sprinkler system pressure	I	MI	
2000 HSC Code				
7.7.1.1.2	Fixed fire detection and alarm systems' power loss or fault condition	A	AU,V	+
7.7.1.1.4	Fire detection signal	A	AU,V	+

IMO Instrument	Function	Priority	Display	Notes
7.9.3.3.3	Fire door indicator	I	VI	
2009 MODU Code				
9.11.1	Fire detection system	A	AU,V	
9.12.1	Gas detection and alarm systems	A	U, V	!
9.11.3	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	II-2/7.4.1*
9.13.1	Hydrogen sulphide detection and alarm system	A	AU, V	
FSS Code				
5.2.2.4.11	Alarm for low and high pressure in the vessel, failure of refrigerating units, low level of the liquid in the vessels	A	AU, V	
8.2.4.2.5	Automatic sprinkler system pressure	I	MI	
8.2.5.2.1, 9.2.5.1.2, 9.2.5.1.3, 9.2.5.1.1	Fire detection or automatic sprinkler operation	A	AU,V	+ +
8.2.5.2.1, 9.2.5.1.5, 9.2.5.1.2	Fire detection system fault	A	AU,V	+ + +
10.2.4.1.4	Smoke detection system power loss	A	AU,V	+
10.2.4.1.1 10.2.4.1.2 10.2.2.3	Smoke detection	A I	AU,V VI	+ + +

* Cross-reference to SOLAS regulation.
\+ These alarms may be omitted if the central fire control station is on the navigation bridge.

Table 10.1.4 – Location: at the equipment or at the location being monitored

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
29.11	Rudder angle indicator	I	MI	At the steering gear compartment
15.8.2.1. 15.8.3	Shell door open/close indicator	I	VI	
32.6	Water level of essential boiler	I	MI	
13.6.1.6	Watertight door closing	EM	AU	Distinct from other alarms in area; in passenger areas and high-noise areas, add intermittent visual alarm
13.6.3.2	Watertight door loss of stored energy	A	AU,V	At each local operating position
33.3	Steam pressure	I	MI	
SOLAS II-2				
10.9.1.1.1	Release of fire-extinguishing medium	EM	AU	Cargo pump-room
4.2.2.3.5.1.1 4.2.2.3.5.2	Fuel oil tank level	I	MI	If provided
10.6.4.2	Alarm for failure of thermostat	A	AU, V	
10.6.4.4	Fire-extinguishing system operation	A	AU	
Gas or chemical codes				
2014 IGC 3.7.1, 3.7.2	Leakage detection	I	VI	
2014 IGC 9.4.6	Gas supply quantity monitoring	I	MI, VI	At insulation spaces continually supplied with an inert gas as part of a leak detection system
2014 IGC 9.5.1 GC 9.5.1	Content of oxygen in inert gas/trace of oxygen in nitrogen	A	(AU,V) MI	
2014 IGC 3.6.3 GC 3.6.3	Warning on both sides of the airlock	A	AU,V	
GC 8.2.8(b)	Indicates which one of the pressure-relief valves is out of service	I	VI	
GC 11.5.2	Inerting/extinguishing medium release	EM	AU	Gas-dangerous enclosed spaces
GC 13.4	Cargo pressure	I	MI	Local gauges required by 13.4.1, 13.4.2, 13.4.3 and 13.4.4
2014 IGC 13.6.4	Oxygen deficiency monitoring	A	(AU, V)	
2014 IGC 13.6.13, 17.5.2; GC 13.6.4, 17.11.1	Gas detection equipment	A	AU,V	
2014 IGC 17.18.18	Oxygen monitor	I	MI	
2014 IGC 17.21.6	Monitoring carbon dioxide build up	I	MI	Location to be monitored: Cargo hold spaces, cargo compressor rooms and other enclosed spaces
IBC 11.2.1	Release of fire-extinguishing medium	EM	AU	II-2/10.9.1.1
IBC 15.8.18	Inert gas and Oxygen monitor in the cargo	I	VI	Cargo tanks, void spaces and other enclosed spaces adjacent to cargo tank carrying propylene oxide

IMO Instrument	Function	Priority	Display	Notes
IBC 15.14.5 BCH 4.11.3	Pressure gauge to indicate pressure in the vapour space above cargo	I	MI	Cargoes which have a vapour pressure greater than 1.033 kp/cm² at 37.8°C
BCH 2.1.2	Airlock door position indicator	A	(AU, V)	Refer: Recommendation on uniform interpretation of the application of 2.7.1 and 2.7.3 of the Bulk Chemical Code to existing chemical tankers
BCH 2.15.6	Detection of toxic cargo	I	VI	In case of heating and cooling of products with a significant toxic vapour hazard
MARPOL 73/78 ***Annex I***				
28(3.1)	Hinged watertight access doors with open/closed indicator	I	VI	!
Annex IV				
9(1.3) 9(2.2)	Indicator for contents in sewage holding tank	I	VI	
SFV Protocol 1993 ***Chapter II***				
13(1)	Automatic non-return valve open/close indicator	I	VI	II-1/15.8.2.1*
13(2)	Sea inlets and discharges valve open/close indicator	I	VI	II-1/15.8.3*
Chapter IV				
11(7)	Collision bulkhead valve closure	I	VI	II-1/21.2.12*
13(3)	Rudder angle indicator	I	MI	II-1/29.11*
15(4)(a)	Refrigerant leak indicator	I	VI	
15(5)	Refrigerating machinery spaces alarm	A	AU,V	At escape exits
Chapter V				
14(3)(c)	Automatic sprinkler system pressure	I	MI	At each section stop valve
14(5)(a)	Automatic sprinkler tank level	I	MI	
15(2)(b)	Fire detection alarm	A	AU	To ensure fire alarm sounding on the deck where the fire is detected
IGS				
3.9.9	Regulating valve open/close indicator	I	VI	
3.14.4.1	Low water flow alarm	A	AU, V	
3.14.4.2	High water level alarm	A	AU, V	
3.14.4.3	Inert gas temperature reaching 65 °C	A	AU, V	If precooler is provided 3.14.4.4 to be followed
3.14.4.5	Cooler water inlet and outlet temperature and scrubber differential pressure	I	VI	
3.14.6	High inert gas pressure alarm	A	AU, V	
3.14.10	Low inert gas pressure of non-return devices	A	AU	
3.15.3.2.1	Effluent drain valve position indicator	I	VI	!
6.2	Tank pressure sensors	I	MI	!
VEC systems				
2.3.1	Isolation valve position indicator	I	VI	
2.4.1.3	Liquid level indicator	I	MI	At the location where cargo transfer is controlled

IMO Instrument	Function	Priority	Display	Notes
2.4.1.4	Liquid level indicator	I	MI	Portable gauging device on the tank
3.2.1.3	Cargo vapour shutoff valve position indicator	I	VI	Near terminal vapour connection
3.3.3	Terminal vapour pressure sensing device	I	MI	!, (3)
3.3.3.2	Terminal vapour pressure alarm	A	AU,V	!, (3)
3.3.3.3	Signal for sequential shutdown of onshore pumps and remotely operated cargo vapour shutoff valve	A	(AU,V)	!, (3)
IMDG Code (Vol I)				
6.2.1.3.5	Pressure receptacle level indicator	I	MI	
6.7.2.8.3, 6.7.3.7.3, 6.7.5.4.3	Pressure gauge/tell-tale indicator of pressure relief system	I	MI	
6.7.3.5.9, 6.7.4.5.8, 6.7.2.5.6, 6.7.5.3.3, 6.9.3.2.1	Stop valve open/close indicator	I	VI	
7.3.7.4.3	Cargo temperature indicator	I	MI	
7.3.7.4.4	Cargo control temperature less than +25°C	A	AU,V	!, Alarms independent of power supply of the refrigeration system
2000 HSC Code				
2.2.9.1	Automatic non-return valve open/close indicator	I	VI	II-1/15.8.2.1*
2.2.9.3	Sea inlets and discharges valve open/close indicator	I	VI	II-1/15.8.3
4.7.7	Indicator for closing, latching and locking arrangements for exits	I	VI	
7.6.1	Ventilation shut-off open/close indicator	I	VI	II-2/5.2.1.1*
7.7.3.3.7	Release of fire-extinguishing medium	EM	AU,V	Spaces in which personnel normally work or to which they have access
7.7.6.2	Alarm for failure of thermostat	A	AU	II-2/10.6.4.2*
7.7.6.4	Fire-extinguishing system operation	A	AU	II-2/10.6.4.4*
7.8.2.3	Fire-extinguishing valve manifold pressure indicator	I	MI	
7.9.3.3.2	Fire door closing	EM	AU	Sounding alarm before the door begins to move and until completely closed
7.13.1	Manually operated sprinkler system alarms	A	AU, V	
10.9.5	Bilge cocks and valve position indication	I	VI	To indicate open or closed position
2009 MODU Code				
3.6.5.2	Watertight doors and hatch cover positions alarm	A	AU,V	
4.4.5	Water level of essential boiler	I	MI	II-1/32.6*
4.5.3	Steam pressure	I	MI	II-1/33.3*
4.9.6	Bilge valve indicator	I	VI	
4.10.8	Ballast valve position indicator	I	VI	
4.12.11	Cable tension, windlass power load and amount of cable paid out	I	VI	
9.3.14.2	Fire damper open/close indicator	I	VI	
12.1.8	Crane hook load and rated load for each radius indicator	I	VI	

IMO Instrument	Function	Priority	Display	Notes
FSS Code				
5.2.1.3.2	Release of fixed gas fire-extinguishing medium	EM	AU	
6.3.1.20	Release of fixed foam fire-extinguishing systems	EM	AU	
8.2.4.2.5	Automatic sprinkler system pressure	I	MI	At each section stop valve
8.2.3.2.1	Automatic sprinkler system tank level	I	MI	
15.2.3.2.1	Inert gas temperature	I	MI	Measured at discharge side of the system during operation
15.2.3.1.5	Flue gas isolating valve open/closed	I	VI	
15.2.4.2.1	Inert gas discharge temperature/pressure	I	MI	Measured at discharge of gas blower
16.2.2.1.6	Clogging of gas sampling lines of fixed hydrocarbon gas detection systems	A	AU, V	
16.2.2.3.3	Vapour concentration reaching a preset value	A	AU, V	
LSA Code				
4.8	Pressure of air supply of lifeboat	I	VI	At self-contained air support system of the life boat
IGF Code				
5.12.5	Gastight bulkheads moved from the closed position	W	AU, V	An audible and visual alarm system to give a warning on both sides of the airlock
6.14.1	Oxygen content by volume	A, I	AU, V, MI	Equipment for producing inert gas
6.14.3	Low oxygen alarm	A	(AU, V)	Nitrogen generator or nitrogen storage facilities
11.7.1 (Part 15, Table 1)	Fixed fire detection and fire alarm system	A	(AU, V)	in fuel storage hold spaces, ventilation trunk to the tank connection space, in the tank connection space
14.3.7	Low liquid level	A	(AU, V)	
15.4.1.1	Liquid level gauge	I	MI	Level reading is always obtainable whenever the liquefied gas fuel tank is operational
15.4.2.1	High liquid level alarm	A	AU, V	Giving an audible and visual warning when activated
15.4.6	Local pressure indicator	I	MI	Each fuel pump discharge line and each liquid and vapour fuel manifold At least one indicator shall be capable of indicating throughout the operating pressure range as per 15.4.9
15.4.7	Pressure indicator	I	MI	Between ship's manifold valves and hose connections to the shore. At least one indicator shall be capable of indicating throughout the operating pressure range as per 15.4.9

IMO Instrument	Function	Priority	Display	Notes
15.4.8	Pressure indicator	I	MI	Fuel storage hold spaces and inter-barrier spaces without open connection to the atmosphere. At least one indicator shall be capable of indicating throughout the operating pressure range as per 15.4.9
15.4.10	Low liquid level	A	(AU, V)	
15.4.11	Temperature of fuel in tank	I	MI	Measure and indicate temperature in at least three locations in the tank except for independent type-C tank with vacuum insulation and pressure build-up fuel discharging units
1995 Diving Code				
2.5.3	Diving bell internal pressure	I	MI	!, At the location of the attendant monitoring diving operations
2.5.5	Diving bell, etc. overpressure alarm	A	AU,V	!, At the location of the attendant monitoring diving operations
2.9.3	Diving equipment fire detection alarm	A	AU,V	!, At the location of the attendant monitoring diving operations
2023 Diving Code				
3.5.3.10	Diving system high/low-level oxygen content alarm	A	AU, V	Mounted at the entrance to enclosed compartments.
3.8.3.5	Diving equipment fire detection alarm	A	AU, V	At the location of attendant monitoring the operation of the PVHO
4.4.5.3.10.1	HBSC internal pressure (Diving depth monitoring)	I	MI	within HBSC
4.7.3.3	Pressure and safe environment indicator	I	MI	Inside PVHO
4.7.3.5	PVHO overpressure alarm	A	AU, V	At the location of attendant monitoring the operation of the PVHO
4.12.3.2	Diving bell and HBSC O_2 and CO_2 level monitor	I	MI	Within the diving bell and HBSC
4.12.3.4	Control system high- and low-level oxygen content alarm	A, I	AU, V, MI	Confined areas with gas control systems using gases with an oxygen content less than 20% or greater than 22%
4.13.3.6	Dynamic Positioning status alarm	A	AU, V	Activated by the DP operator and fitted at the dive control stand/station
EGCS Guidelines				
2.1.2.2	Indication of Emission ratio when EGCS is in operation	I	VI	Scheme B schemes for approval of an EGCS
2.1.5	Monitoring systems for exhaust emissions, operating parameters, inlet water, wash water and discharge water in relation to either Scheme A or Scheme B	I	VI	For details refer to section 8 of EGCS Guidelines
2.1.7	Discharge water monitoring system	I	VI	For details refer to section 10 of EGCS Guidelines
OSV Chemical Code				
7.2.3	Over-pressure or under-pressure in tank	A	AU, V	II-2/11.6.3.2*

IMO Instrument	Function	Priority	Display	Notes
9.2	Release of fire-extinguishing medium	EM	AU	II-2/10.9.1.1.1*
15.5.4	Cargo tank pressure and vapour release	A, I	AU, V, MI	At cargo areas
16.4.2.2.1	Fixed vapour detection instruments to indicate H2S and LEL levels	A	AU, V	Installed in the venting system of the relevant tanks
18.7	Oxygen content monitor	I	MI	At enclosed space for handling and storage of liquified gas

* Cross-reference to SOLAS regulation.
! No location specified in other IMO instruments. Location is recommended.

Table 10.1.5 – Location: engineers' accommodation

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
38	Engineers' alarm	A	AU	Column 4, table 9.3
51.1.2, 51.1.5	Fault requiring attention of the engineer on duty	A	AU,V	Ditto (machinery alarm)
SOLAS II-2				
7.4.1, 7.4.2	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU,V	Ditto
Present Code				
3.3.7 and 8.1	Personnel alarm	A	AU,V	Column 4, table 9.3 (when the navigation bridge is unmanned)
SFV Protocol 1993 ***Chapter IV***				
14	Engineers' alarm	A	AU	Column 4, table 9.3 II-1/38*
22(2)(b) 22(2)(c)	Fault requiring attention of engineer on duty	A	AU,V	Column 4, table 9.3 II-1/51.1.2; II-1/51.1.5*
2000 HSC Code				
7.7.2.1	Fire detection for periodically unattended machinery spaces	A	AU,V	Column 4, table 9.3 II-2/7.4.1.1; II-1/7.4.2*
2009 MODU Code				
7.8	Engineers' alarm	A	AU	Column 4, table 9.3 II-1/38*
8.7.1	Fault requiring attention	A	AU	Activate engineers' alarm required by 7.8 including 8.3.5.1, 8.4.1, 8.4.3, 8.8.5 and 8.9 II-1/51.1.5*
9.11.3	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	II-2/7.4.1*

* Cross-reference to SOLAS regulation.

Table 10.1.6 – Location: miscellaneous

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
13.6.1.4,13-1.2,13-1.3	Watertight door position	I	VI	To be provided at the accessible position above the bulkhead deck. To be provided locally
35-1.3.12	Bilge cocks and valves position	I	VI	At their place of operation
SOLAS II-2				
7.4.1, 7.4.2	Fire detection in periodically unattended, automated or remotely-controlled machinery space	A	AU,V	Alarm at attended location when navigation bridge is unmanned
7.9.1	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
7.9.4	Fire (special alarm to summon crew)	EM	AU	May be part of general emergency alarm
4.5.10.1.3	Hydrocarbon gas detection in tankers cargo pump-rooms	A	AU,V	At the pump-room
+4.5.10.1.1	Temperature sensing devices for pumps installed in tankers cargo pump-rooms	A	AU,V	At the pump control station
10.5.6.4	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.
7.5.2, 7.5.3.1	Fire alarm	EM	AU	Audible alarm within the space where detectors are located.
9.4.1.1.9, 9.7.2.6,9.7.3.1.3	Open position of damper	I	VI	
5.2.1.1,9.7.1.5	Open/close of inlets and outlets of ventilation systems	I	VI	
10.3.2.4	Indication if portable fire extinguishers have been used	I	VI	
11.6.3.3	Open/close of bypass in vent mains of cargo tanks	I	VI	
SOLAS III				
6.4.2	General emergency alarm	EM	AU	Throughout all the accommodation and normal crew working spaces
Gas or Chemical Codes				
IBC 13.2.2, BCH 3.11.2	Vapour detection instrument	I	MI	Vapour-detection instruments may be portable or fixed. If a fixed system is installed, at least one portable instrument should be provided
IBC 15.11.7, BCH 4.8.7	Cargo leakage detector	I	VI	
IBC 15.15, BCH 4.24	Hydrogen sulphide (H2S) detection equipment	I	VI	
IBC 15.21, BCH 4.23	Cargo pump temperature	I	VI	
IBC 3.1.4	Leak detection	I	VI	In case cargo piping systems or cargo ventilation systems are to be separated

IMO Instrument	Function	Priority	Display	Notes
SFV Protocol 1993 ***Chapter II***				
2(6)	Watertight door position	I	VI	At remote operating position II-1/13.6.1.4*
4(1)	Freezer room weathertight door position	A	AU,V	!, At the attended location
Chapter IV				
15(5)	Refrigerating machinery spaces alarm	A	AU,V	At an attended location (control station) or escape exits
19(5)	Fire detection alarm	A	AU,V	At appropriate spaces when the ship is in harbour
20(1)	Bilge high-water level alarm	A	AU,V	At places where continuous watch is maintained when navigation bridge is not manned II-1/35-1.2.6.2*
Chapter V				
14(2)(b)	Fire detection or automatic sprinkler operation	A	AU,V	Alarm at location easily accessible to crew at all times
15(2)(b)	Fire detection alarm	A	AU,V	Alarm at location easily accessible to crew at all times II-2/7.9.1*
9(1)(b)(ii)	Open position of damper	I	VI	II-2/7.3.1.3*
Resolution MSC.128(75), Annex				
4.1.2.4, 5.2.4	BNWAS second stage audible alarm	A	AU	Locations of the master, officers and further crew members capable of taking corrective action
4.1.2.5, 5.2.4	BNWAS third stage audible alarm	A	AU	Locations of the master, officers and further crew members capable of taking corrective action. If provided (ref. 4.1.2.6)
SFV Protocol 1993 ***Chapter VIII***				
2(1)	General emergency alarm	EM	AU	Throughout all the accommodation and normal crew working spaces III/6.4.2*
Nuclear Merchant Ship Code				
3.9.3	Spaces containing NSSS safety equipment fire detection alarm	A	AU,V	!, Alarm at main control position and emergency control position
6.4.3	Controlled areas indication of radiation levels and airborne contamination	I	VI	At main control position
6.10.2	Containment structure purge system radioactivity alarm	A	AU,V	At main control position
6.10.4	Controlled and supervised areas exhaust for radioactivity alarm	A	AU,V	At main control position
4.3.2.6	Position of neutron absorber element	I	VI	Shall be provided at the main reactor control room
4.9.6	Failure or malfunction of any item of equipment in any instrument channel	A	AU,V	
4.9.7	Continuity of operation or safety	A	AU,V	

IMO Instrument	Function	Priority	Display	Notes
4.9.9	Continuity of operation, safety or maintenance	I	VI	Shall be provided in the reactor control room, locally and in the emergency control position
4.10.6	Failure or malfunction of instrument channel of the reactor protection system	A	AU,V	
4.11.2.3	Pressure gauge and water level indicator	I	MI	Equipped on pressurized water accumulators
6.4.1.2	Radiation levels and activity concentrations	I	VI	For primary and secondary coolant circuits and of all radioactive wastes stored on board and of all potentially radioactive discharges from the ship
6.4.1.3	Activity concentrations of fluids	I	VI	
6.4.3	Radiation and airborne contamination levels in secondary and intermediate coolant circuits as well as the atmosphere inside the containment structure	I	VI	Presented at central control point
6.4.3	Significant increase in radiation and airborne contamination levels detected inside safety enclosure	W	AU,V	Presented inside safety enclosure
6.4.10.3	Rate of release of radioactivity and the total activity released in the gaseous discharge lines	A	AU,V	
6.4.10.6	Liquid waste activity concentration and the discharge flow rate	A	AU,V	
2000 HSC Code				
2.2.5.2	Water leakage detection indicator	I	VI	II-1/17-1.3*
4.2.1	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*
7.5.6.6	Fixed vapour detection system	A	AU, V	
7.7.1.1.4	Fire detection signal	A	AU,V	Clearly audible throughout the crew accommodation and service spaces
7.7.1.1.6	Fire detection manually operated call point section unit indicator	A	AU,V	Alarm at location easily accessible to crew at all times
2009 MODU Code				
2.7.14	Underwater bracing leak detection system	I	VI	
3.6.2	Watertight boundary valve position indicator	I	VI	At the remote control station
4.4.2	Oil-fired boiler low water level, air supply failure or flame failure	A	AU,V	Alarm at an attended location II-1/32.2*
4.9.1	Presence of water indicator	I	VI	
4.12.12	Cable tension and speed and direction of wind	I	VI, MI	At a manned station
4.14.3.1	Jacking system overload alarm, out of level alarm, rack phase differential alarm (when provided)	A	AU, V	At the jacking system control station
4.14.3.2.1	Inclination of the unit on two horizontal perpendicular axes	I	MI	At the jacking system control station
4.14.3.2.2	Power consumption or other indicators or lifting or lowering the legs, as applicable	I	MI	At the jacking system control station

IMO Instrument	Function	Priority	Display	Notes
4.14.3.2.3	Brake release status	I	VI	At the jacking system control station
6.3.1.1.3	Loss of ventilation	A	AU,V	At a manned station
6.3.1.2.3	Loss of ventilation	A	AU,V	At a manned station
6.3.1.3.3	Loss of ventilation overpressure	A	AU,V	At a manned station
8.7.1	Fault requiring attention	A	AU,V	Including 8.3.5.1, 8.4.1, 8.4.3, 8.8.5 and 8.9 II-1/51.1*
9.11.1	Fire detection system alarm	A	AU,V	At alarm location easily accessible to crew at all times
9.12.1	Gas detection and alarm system	A	AU,V	!, Alarm at a location easily accessible to crew at all times
9.11.3	Fire detection in periodically unattended, automated or remotely controlled machinery space	A	AU, V	II-2/7.4.1*
9.13.1	Hydrogen sulphide detection and alarm system	A	AU, V	
5.7.2	General emergency alarm	EM	AU	Clearly perceptible in all parts of the unit III/6.4.2*
13.5.1	Wind direction indicator	I	MI	It should be free from the effects of airflow disturbances caused by nearby objects or rotor downwash and be visible from a helicopter in flight or in a hover over the helideck
13.5.26	Status light	A	V	To be visible to the helicopter pilot from any direction of approach
13.6	Motion sensing system	I	MI	Display should be located at the aeromobile VHF radiotelephone station
9.3.14.2	Fire damper position	I	VI	Not required where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce
FSS Code				
8.2.5.2.1	Fire detection or automatic sprinkler operation	A	AU, V	Alarm at attended location other than navigation bridge and central fire control station
9.2.5.1.3	Fire detection alarm	A	AU, V	Alarm at location easily accessible to crew at all times
9.2.5.1.1	Fire detection alarm not receiving attention	EM	AU	Alarmed to crew; may be part of general emergency alarm
3.2.1.2.2	Reduction in volume of air of compressed air breathing apparatus	A	AU, V	
5.2.2.4.3.6	Liquid CO_2 level indicator	I	MI	
9.2.1.7	Fire detection alarm	A	AU	In passenger ships within spaces where fire detectors are located
9.2.3.1.7	Fixed fire detection and fire alarm systems	A	AU, V	Installed on cabin balconies of ships. II-2/7.10*
LSA Code				
Ch. VII 7.2.1	General emergency alarm	EM	AU	

IMO Instrument	Function	Priority	Display	Notes
IGF Code				
5.12.6	Loss of pressure and opening of the airlock doors	A	AU, V	Audible and visual alarms shall be given at a manned location when pressure is lost
13.3.9.2.1	Failure of the overpressure ventilation	A	AU, V	An audible and visual alarm shall be given at a manned location
13.3.10.1	Failure of the extraction ventilation	A	AU, V	An audible and visual alarm shall be given at a manned location
11.7.1 (Part 15, table 1)	Fixed fire detection and fire alarm system	A	(AU, V)	For all rooms of the fuel gas system where fire cannot be excluded.
14.3.7	Automatic shutdown of the motors in the event of low-low liquid level	A	AU, V	At continuously manned central control station or onboard safety centre.
15.3.2	High level in the bilge well	A	(AU, V)	Alarm shall be given - bilge well in each tank connection space
15.3.2	Bilge water level indicator	I	MI	
15.3.2	Low temperature indicator	I	VI	
15.4.2.5	Overflow control override operation indicator	I	VI	At continuously manned central control station or onboard safety centre.
15.4.3	Direct reading gauge	I	VI	At continuously manned central control station or onboard safety centre.
15.4.5	High- and low-pressure alarm	A	(AU, V)	At continuously manned central control station or onboard safety centre.
15.4.10	Automatic shutdown of the motors	A	AU, V	At continuously manned central control station or onboard safety centre.
15.6.2	Temperature monitor for the bulkhead shaft glands and bearings	A	AU, V	In the continuously manned central control station as per 15.8.8
15.7.1	Operation of the engine in case of gas-only engines	I	VI	At the manoeuvring platform
15.7.2	Operation and mode of operation of the engine in the case of dual fuel engines	I	VI	At the manoeuvring platform
15.8.1.1 15.8.6	Gas detection in tank connection space at 20% LEL	A	AU, V	In the continuously manned central control station as per 15.8.8
15.8.1.1 15.8.6	Gas detection on two detectors in tank connection space at 40% LEL	A	AU, V	In the continuously manned central control station as per 15.8.8
15.8.7	Gas detection in ventilated duct around gas pipes in the machinery space at 30% LEL	A	AU, V	In the continuously manned central control station as per 15.8.8
15.8.7	Gas detection on two detectors in ventilated duct around gas pipes in the machinery space at 60% LEL	A	AU, V	In the continuously manned central control station as per 15.8.8
Part 15, table 1	Bilge well high level in tank connection space	A	(AU, V)	
Part 15, table 1	Bilge well low temperature in tank connection space	A	(AU, V)	
15.8.1.1 Part 15, table 1	Gas detection in duct between tank and machinery space containing gas-fuelled engines at 20% LEL	A	(AU, V)	

IMO Instrument	Function	Priority	Display	Notes
15.8.1.1 Part 15, table 1	Gas detection on two detectors in duct between tank and machinery space containing gas-fuelled engines at 40% LEL	A	(AU, V)	
15.8.1.4 Part 15, table 1	Gas detection in fuel preparation room at 20% LEL	A	(AU, V)	
15.8.1.4 Part 15, table 1	Gas detection on two detectors in fuel preparation room at 40% LEL	A	(AU, V)	
15.8.1.2	Gas detection in all ducts around fuel pipes;	A	(AU, V)	
15.8.1.3	Gas detection in Machinery spaces containing gas piping, gas equipment or gas consumers;	A	(AU, V)	
15.8.1.4	Gas detection in Compressor rooms	A	(AU, V)	
15.8.1.5	Gas detection in other enclosed spaces containing fuel piping or other fuel equipment without ducting;	A	(AU, V)	
15.8.1.6	Gas detection in other enclosed or semi-enclosed spaces where fuel vapours may accumulate including inter-barrier spaces and fuel storage hold spaces of independent tanks other than type C;	A	(AU, V)	
15.8.1.7	Gas detection in airlocks	A	(AU, V)	
15.8.1.8	Gas heating circuit expansion tanks;	A	(AU, V)	
15.8.1.9	Gas detection in motor rooms associated with the fuel systems;	A	(AU, V)	
15.8.1.10	Gas detection in ventilation inlets to accommodation and machinery spaces if required based on the risk assessment required in 4.2.	A	(AU, V)	
15.8.2 (Part 15, table 1)	Gas detection in ESD protected machinery space containing gas-fuelled engines at 20% LEL	A	(AU, V)	
15.8.2 (Part 15, table 1)	Gas detection on two detectors in ESD protected machinery space containing gas-fuelled engines at 40% LEL	A	(AU, V)	
15.9 (Part 15, table 1)	Gas detection in duct inside machinery space containing gas-fuelled engines at 30% LEL	A	(AU, V)	
15.9 (Part 15, table 1)	Gas detection on two detectors in duct inside machinery space containing gas-fuelled engines at 60% LEL	A	(AU, V)	
15.10.1 (Part 15, table 1)	Loss of ventilation in duct between tank and machinery space containing gas-fuelled engines	A	(AU, V)	In a continuously manned central control station or safety centre
15.10.1 (Part 15, table 1)	Loss of ventilation in duct inside machinery space containing gas-fuelled engines	A	(AU, V)	In a continuously manned central control station or safety centre
15.10.2 (Part 15, table 1)	Loss of ventilation in ESD protected machinery space containing gas-fuelled engines	A	(AU, V)	In a continuously manned central control station or safety centre
Part 15, table 1	Abnormal gas pressure in gas supply pipe	A	(AU, V)	
Part 15, table 1	Failure of valve control actuating medium	A	(AU, V)	Time delayed as found necessary
1995 Diving Code				
2.5.2	Compression chamber internal pressure	I	MI	At central control position
2.5.3	Diving bell external pressure	I	MI	Within the bell

IMO Instrument	Function	Priority	Display	Notes
2.9.3	Diving equipment fire detection alarm	A	AU, V	!, At an attended location other than the above
2.11.2	Compression chamber/diving bell parameters	I	MI	At central control position
2.11.3	Diving bell oxygen and CO_2 levels	I	MI	Within the bell
2023 Diving Code				
3.5.3.10	Diving system high/low-level oxygen content alarm	A	AU, V	Repeated at a manned control station for the diving platform.
3.8.3.5	Diving equipment fire detection alarm	A	AU, V	
4.7.3.2	Internal pressure and safe environment indicator	I	VI	At central control position
4.7.3.3	External pressure on submerged PVHO	I	MI	Inside PVHO
4.12.3.6	Life support parameter alarms	A	AU, V	At the central control position if any life-support parameter is outside of acceptable limits.
4.13.3.8	Diving unit general alarm	A	AU, VI	In the dive and saturation control stands.
ISPS Code				
9.43	Automatic intrusion-detection device	A	AU, V	At location that is continuously attended or monitored
IP Code ***Part II***				
8.2.4	Emergency communication to all persons on board	A	AU, V	
OSV Chemical Code				
7.2.3	Over-pressure or under-pressure in tank	A	AU, V	II-2/11.6.3.2*

* Cross-reference to SOLAS regulation.
\+ These alarms may be omitted if they are provided at the cargo control station.

Table 10.1.7 – Location: cargo control station

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-2				
11.6.3.1	Cargo tank high level alarm and gauging	A	AU, V MI	+,!, If required
4.5.10.1.1	Temperature sensing devices for pumps installed in tankers cargo pump rooms	A	AU, V	+
4.5.10.1.3	Hydrocarbon gas detection in tankers cargo pump rooms	A	AU, V	
4.5.3.2.2	Operation status of the valve of venting arrangement of cargo tank	I	VI	
11.6.3.2	Over-pressure or under-pressure in tank	A	AU, V	
Gas or chemical codes				
IBC 8.2.3 BCH 2.13.1	High level of the liquid in any tank	A	AU, V	!, (2)
IBC 15.10.2 BCH 4.3.1(b)	Failure of mechanical ventilation system for maintaining low gas concentration in cargo tanks	A	AU, V	!, Sulphur liquid
IBC 15.19.2 BCH 4.14.3	Power failure on any system essential for safe loading	A	AU, V	!, (2)
IBC 15.19.6 BCH 4.14.1	High level alarm, cargo tank	A	AU, V	!, (2)
IBC 8.3.3 BCH 2.14.3	Controlled tank venting system vapour pressure monitoring and alarm	A	AU, V	
IBC 11.1.4 BCH 3.13.5	Flammable vapour monitoring and alarm	A	AU, V	
IBC 15.3.15 BCH 4.1.15	Inert Gas pressure monitoring and over-/under-pressure alarms	A	AU, V	Carbon disulphide
IBC 15.3.18 BCH 4.1.18	Pump temperature alarm	A	AU, V	
2014 IGC 13.2.1 GC 13.2.1	Cargo level	I	MI	(2)
2014 IGC 13.4.1, 13.4.2 GC 13.4.1	High and low pressure in cargo tank	A	MI AU, (V)	(2)
2014 IGC 13.6.13, 17.5.2 GC 13.6.4, 17.11.1	Gas detection equipment	A	AU, (V)	
2014 IGC 17.16.4.4 GC 17.12.2(d)(iv)	Cargo high pressure, or high temperature at discharge of compressors	A	AU, V	(2), Methylacetylene-propadiene mixtures
GC 10.2.2	Shutdown of submerged cargo pumps	A	(AU, V)	
2014 IGC 17.13.4.3 GC 17.12.5(d)(iii)	Gas detecting system monitoring chlorine concentration	A	AU, V	!, (3)
2014 IGC 17.13.4.4 GC 17.12.5(d)(iv)	High pressure in cargo tanks(chlorine)	A	AU, (V)	!, (2)
2014 IGC 13.3.1 GC 13.3.1	High liquid level in cargo tank	A	AU, V	!, (2)
2014 IGC 13.5.1 GC 13.5.1	Cargo temperature	I	MI	!, (2)
2014 IGC 13.7.2.2 GC 13.5.2	Hull or insulation temperature	I A	MI AU,(V)	!
2014 IGC 13.7.2.3 GC 13.5.3	Cargo tank temperature	I	MI	!, (2)

IMO Instrument	Function	Priority	Display	Notes
2014 IGC 13.6.14, 13.6.15 GC 13.6.11	Gas detection equipment	A	AU,V MI	!, (3)
2014 IGC 17.13.1.4 GC 17.12.5(a)(iv)	Gas detection after bursting disk for chlorine	A	(AU, V) MI	!, (2)
IBC 15.7.10 BCH 4.5.10	High level of phosphorus	A	(AU,V)	!, (2)
IBC 15.19.7.2 BCH 4.14.2(b)	Overflow alarm	A	AU,V	!
2014 IGC 5.2.2.4 GC 5.2.5(b)	Liquid cargo in the vent system	A	(AU,V)	!, (2)
2014 IGC 8.4.2.8.3 GC 8.4.2(a)	Vacuum protection of cargo tanks	A	(AU,V)	!, (2)
2014 IGC 9.5.2, GC 9.5.2	Inert gas pressure monitoring	A	(AU,V)	!
2014 IGC 5.6.6	Cargo filter blockage indictor	I	VI	
2014 IGC 10.2.9	Submerged cargo pump motors shutdown alarm	A	AU, V	
2014 IGC 17.21.4	Cargo tank low pressure alarm for carbon dioxide	A	AU, V, MI	
IGS				
3.15.3.2.1	Effluent drain valve position indicator	I	VI	!
6.2	Tank pressure sensors	I	MI	!, If required
VEC systems				
2.5.2.3	Tank overflow alarm	A	AU,V	!, (2)
2.5.2.4	Signal for sequential shutdown of onshore pumps or valves or both and of the ships' valves	A	(AU,V)	!, (2)
2.5.2.5	Overflow alarm and shutdown signal	A	(AU,V)	At an attended location !, (2)
2.5.2.6	Loss of power to the alarm system	A	(AU,V)	!, (2)
2.5.2.6	Tank level sensor electrical circuitry failure	A	(AU,V)	!, (2)
2.6.4	Main vapour collection line pressure	I	MI	!, (2) VEC is equipped, common to two or more tanks
2.6.4.1	High vapour pressure alarm	A	(AU,V)	!, (2) VEC is equipped, common to two or more tanks
2.6.4.2	Low vapour pressure alarm	A	(AU,V)	!, (2) VEC is equipped, common to two or more tanks
2.5.2.7	Alarm circuitry and sensor condition monitor	I	VI	!, (2)
FSS Code				
9.2.5.1.3	Fire detection alarm	A	AU, V, VI	Indicating units for identifying the activated detector in ships constructed on or after 1 July 2014
15.2.2.4.4.2.1 15.2.2.4.4.3	Inert gas pressure	I	MI	
15.2.2.4.4.2 15.2.2.4.3	Inert gas O_2 content	I	MI	
16.2.2.3.3	Vapour concentration reaching a preset value	A	AU, V	
15.2.2.4.5.1	All systems:			
15.2.2.4.5.1.1	- oxygen content	A	AU, V	
15.2.2.4.5.1.2	- indicating devices power supply failure	A	AU, V	

IMO Instrument	Function	Priority	Display	Notes
15.2.2.4.5.1.3 15.2.2.4.5.3	- low gas pressure	A	AU, V	
15.2.2.4.5.1.4	- high gas pressure	A	AU, V	
15.2.2.4.5.1.5	- automatic control system power supply failure	A	AU, V	
15.2.2.4.5.4	oxygen level below 19%	A	AU, V	
15.2.3.2.2	Flue gas and inert gas generator systems:			
15.2.3.2.2.1	- insufficient fuel oil supply	A	AU, V	
15.2.3.2.2.2	- generator power supply failure	A	AU, V	
15.2.3.2.2.3	- low water pressure or flow rate	A	AU, V	
15.2.3.2.2.4	- high water level	A	AU, V	
15.2.3.2.2.5	- high gas temperature	A	AU, V	
15.2.3.2.2.6	- blower failure	A	AU, V	
15.2.3.2.2.7 15.2.2.3.1.4	- water seal low level	A	AU, V	
15.2.4.2.2	Nitrogen generator systems:			
15.2.4.2.2.1	- electric heater failure	A	AU, V	
15.2.4.2.2.2	- low feed-air pressure or flow	A	AU, V	
15.2.4.2.2.3	- high-air temperature	A	AU, V	
15.2.4.2.2.4	- water separator high condensate level	A	AU, V	
OSV Chemical Code				
6.6.3	Pump discharge pressure gauge	I	MI	Outside cargo pump-room
11.1.1, 11.1.2	Level indicators for cargo tanks	I	MI	
11.3	High-level alarm	A	AU, V	As per requirements of 15.19 of the IBC Code
15.5.4	Cargo tank pressure and vapour release	A, I	AU, V, MI	

* Cross-reference to SOLAS regulation.
! No location specified in other IMO instruments. Location is recommended.
(2) and (3) See notes following paragraph 10.2.
\+ These alarms may be omitted if they are provided at the pump control.

Table 10.1.8 – Location: not indicated by IMO instruments

IMO Instrument	Function	Priority	Display	Notes
SOLAS II-1				
5.6	Draught indicator	I	MI	For every ship as required by II-1/5.6*
SOLAS II-2				
4.5.10.1.4	Pump-room bilge high level alarm	A	AU,V	Recommended Location: w/h or ecr
4.5.4.2	Flammable vapour monitoring	A, I	AU, V,MI	
Gas or chemical codes				
IBC 7.1.5 BCH 2.15.5(a)	Alarm & Monitoring of cargo temperature	A	AU, V, MI	Alert system only required if overheating or overcooling could result in a dangerous condition Recommended Location: w/h or cargo control station
IBC 13.1.1 BCH 3.9	Cargo tank levels	I	MI	Recommended Location: cargo control station
IBC 15.7.7 BCH 4.5.7	High temperature of phosphorus	A	AU, V	Recommended Location: w/h or cargo control station
2009 MODU Code				
4.10.15	Draught indicator	I	MI	At an attended location II-1/5.6*
2000 HSC Code				
2.7.8	Draught indicator	I	MI	At an attended location. II-1/5.6*
BWMS Code (MEPC.300(72))				
4.7	Proper operation of the BWMS	A	AU,V	Recommended Location: All stations from which ballast water operations are controlled
4.9.2	Cleaning, calibration or repair indication	I	VI	
4.9.3, 7.2	Bypass alarm	A	AU, V	
4.21	BWMS that could emit dangerous gases	A	AU, V	Recommended Location: local area and at a manned BWMS control station in case of leakage
Annex, part 5-5.3.5	Shutdown of system while in operation	A	(AU, V)	
	When maintenance is required	C	(AU, V)	
	BWMS bypass valve status	A	(AU, V)	
Annex, part 5-5.3.6	Alert for BWMS parameter exceeding acceptable range	W	(AU, V)	
	Combination of relevant parameters exceeds system specifications	W	(AU, V)	
	Safety relevant parameter exceeds approved limits	A	AU	note: e.g. hydrogen level at appropriate measurement points
BWM Convention				
Guidelines (G10) (MEPC.140(54)) annex (3.9.5)	Prototype ballast water treatment technology failure	A	AU, V	

* Cross-reference to SOLAS regulation.

Table 10.1.9 – Location: central ballast control station of column-stabilized MODUs

IMO Instrument	Function	Priority	Type	Notes
2009 MODU Code				
3.6.5.1	Watertight doors and hatch cover position indicator	I, A	VI, V	
3.6.5.2	Watertight doors and hatch cover position alarm	A	AU, V	
4.9.8.1	Flooding detector	I	VI	
4.9.8.3	Propulsion room and pump-room bilge high water level alarm	A	AU, V	
4.10.10.2	Ballast pump status-indicating system	I	VI	For details see also 4.10.12
4.10.10.4	Ballast valve position-indicating system	I	VI	For details see also 4.10.17
4.10.10.5	Tank level indicating system	I	VI	For details see also 4.10.14
4.10.10.6	Draught indicating system	I	VI, MI	For details see also 4.10.15
4.10.10.7	Heel and trim indicators	I	VI, MI	
4.10.10.8	Main and emergency power available indication	I	VI	
4.10.10.9	Ballast system hydraulic/pneumatic pressure indicating system	I	VI, MI	
4.10.14.1	Ballast tanks liquid level	I	MI	
4.10.14.2	Other tanks liquid level	I	MI	
4.10.17	Ballast valve position	I	VI	!

Table 10.1.10 – Location: bunkering control station

IMO Instrument	Function	Priority	Type	Notes
IGF Code				
6.14.2	Inert gas pressure monitoring	A	(AU, V)	
8.5.8	Operation of remote operated shutdown valve	A	(AU, V)	15.5.1 Trigger of the alarm to full closure of the remote operated valve
14.3.7	Automatic shutdown of the motors in the event of low-low liquid level	A	AU, V	15.5.1
15.4.10	Automatic shutdown of the motors	A	AU, V	15.5.1
15.5.1	Overfill alarm	A	(AU, V)	
15.5.2	Ventilation stopped in the ducting enclosing the bunkering lines	A	AU, V	
15.5.3	Gas detected in the ducting around the bunkering lines	A	AU, V	
10.3.2.2 10.3.4.2 (Part 15, table 1)	Manually activated emergency shutdown of engine	A	(AU, V)	
15.4.1.1	Liquid level gauge	I	MI	
15.4.11	Temperature of fuel in tank	I	MI	

11 LIST OF REFERRED INSTRUMENTS

11.1 *IBC Code*. The International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (resolution MSC.4(48), considering amendments until resolution MSC.440(99)).

11.2 *BCH Code*. The Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (resolution MSC.9(53), considering amendments until resolution MSC.463(101)).

11.3 *IGC Code*. The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (resolution MSC.5(48), considering amendments until resolution MSC.492(104)).

11.4 *Gas Carrier (GC) Code*. The Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (resolution A.328(IX), considering amendments until resolution MSC.225(82)).

11.5 *SFV Protocol 1993*. The Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 as modified by the Cape Town Agreement of 2012.

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

11.7 *2000 HSC Code*. The International Code of Safety for High-Speed Craft, 2000 (resolution MSC.97(73), considering amendments until resolution MSC.499(105)).

11.8 *VEC Systems*. The Standards for Vapour Emission Control Systems (MSC/Circ.585).

11.9 *IMDG Code*. The International Maritime Dangerous Goods Code (resolution MSC.122(75), considering amendments until resolution MSC.501(105)).

11.10 *1995 Diving Code*. The Code of Safety for Diving Systems, 1995 (resolution A.831(19), considering amendments until resolution MSC.185(79)).

11.11 *2009 MODU Code*. The Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (resolution A.1023(26) considering amendments until resolution MSC.547(107)).

11.12 *Nuclear Merchant Ship Code*. The Code of Safety for Nuclear Merchant Ships (resolution A.491(XII)).

11.13 *FSS Code*. The International Code for Fire Safety Systems (resolution MSC.98(73), considering amendments until resolution MSC.484(103)).

11.14 *LSA Code*. The International Life-Saving Appliance (LSA) Code (resolution MSC.48(66), considering amendments until resolution MSC.485(103)).

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

11.16 *IGF Code.* The International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (resolution MSC.391(95), as amended)

11.17 *IP Code.* International Code of Safety for Ships Carrying Industrial Personnel (resolution MSC.521(106)).

11.18 *SOLAS.* International Convention for Safety of Life at Sea considering amendments, 1974, considering amendments until resolution MSC.521(106).

11.19 *MARPOL.* International Convention for the Prevention of Pollution from Ships (Annex I to VI), considering amendments until resolution MEPC.362(79).

11.20 *BWM Convention.* Ballast Water Management Convention, considering amendments until resolution MEPC.325(75).

11.21 *BWMS Code*. Code for Approval of Ballast Water Management Systems (resolution MEPC.300(72)).

11.22 *ISPS Code.* International Ship and Port Facility Security Code, considering amendments until resolution MSC.196(80).

11.23 *2023 Diving Code.* International Code of Safety for Diving Operations, 2023, as adopted by MSC.548(107).

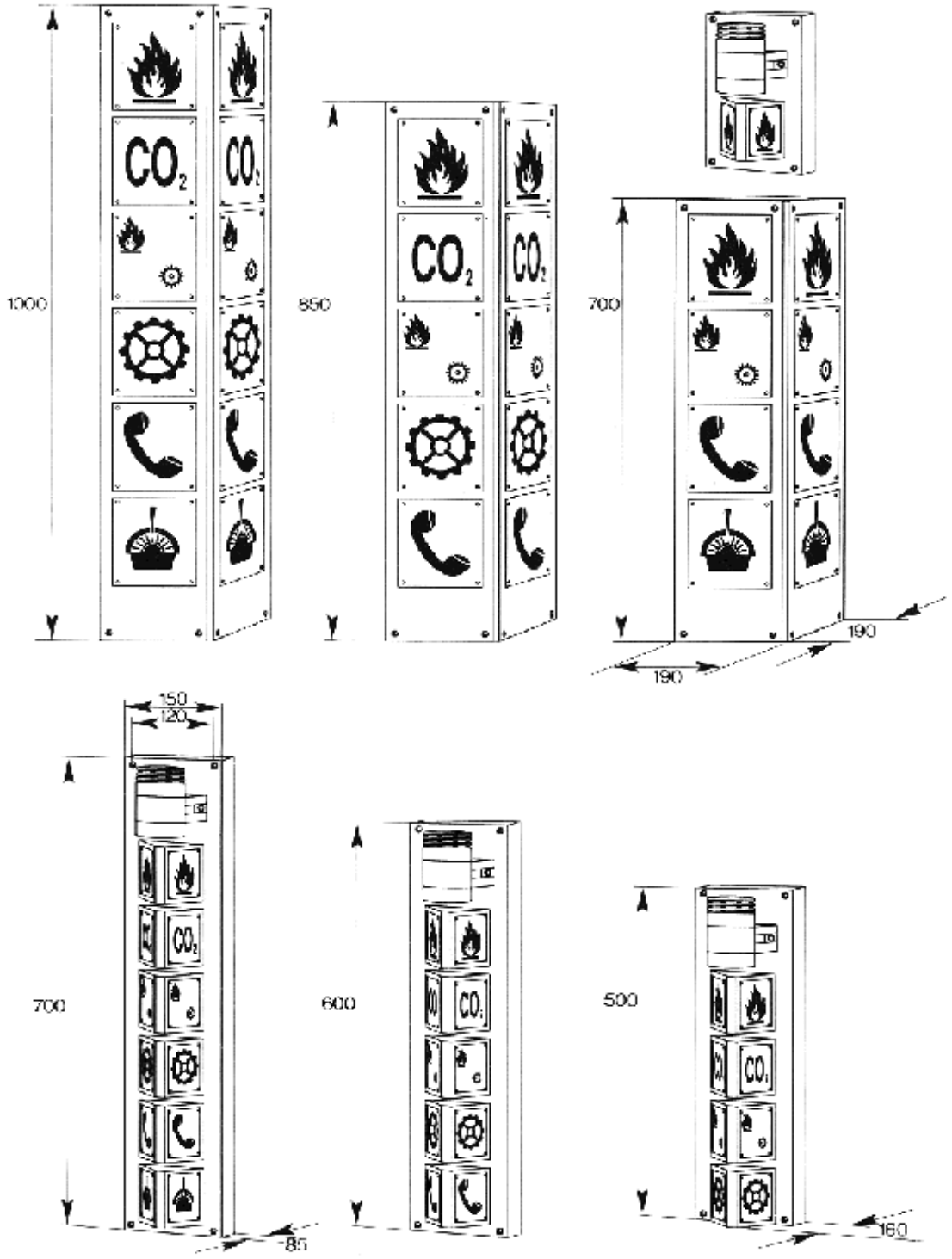
11.24 *EGCS Guidelines*. 2021 Guidelines for Exhaust Gas Cleaning Systems (resolution MEPC.340(77)).

11.25 *OSV Chemical Code*. Code for the Transport and Handling of Hazardous and Noxious Liquid Substances in Bulk on Offshore Support Vessels (resolution A.1122(30)).

11.26 *Resolution MSC.252(83).* Revised Performance Standards for Integrated Navigation Systems (INS).

APPENDIX

SAMPLE OF INDICATOR COLUMNS WITH DIMENSIONS (mm)



Note: Diagrams above are representative only. Symbols should be as in tables 7.1.1 to 7.1.3.