





IMO

ASSEMBLY - 17th session  
Agenda item 10

RESOLUTION A.686(17)  
adopted on 6 November 1991

CODE ON ALARMS AND INDICATORS

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,

NOTING that many IMO instruments, such as the 1974 SOLAS Convention, as amended, and the IBC, BCH, IGC and GC Codes, as amended, contain provisions for alarms and indicators,

NOTING ALSO the proliferation of alarm systems, indicators and monitoring equipment which are being installed in accordance with or in excess of the above IMO instruments,

RECOGNIZING the need to develop guidelines for alarm and indicator systems in order to promote consistency, to reduce the number and variety of alarms and indicators used and thereby to avoid confusion to crew members and also to ensure uniformity in application of the above IMO instruments,

RECOGNIZING ALSO the need for such guidelines for alarms and indicators to be extended in the future to cover all IMO instruments which have been or may be developed,

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee at its fifty-ninth session,

1. ADOPTS the Code on Alarms and Indicators set out in the annex to the present resolution;
2. RECOMMENDS Governments:
  - (a) to take appropriate steps to apply the Code;
  - (b) to use the Code as an international safety standard for designing alarms and indicators for ships, ships' equipment and machinery;
  - (c) to inform the Organization of measures taken for the application of the Code;

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3. URGES the Maritime Safety Committee and the Marine Environment Protection Committee to take account of the provisions of the Code when developing new standards on alarms and indicators;

4. AUTHORIZES the Maritime Safety Committee and the Marine Environment Protection Committee to amend or extend the Code as may be necessary.

ANNEX

CODE ON ALARMS AND INDICATORS

PREAMBLE

This Code has been developed on the basis of the following principles:

1 The Code is a recommendatory document primarily directed to ships covered by the International Convention for the Safety of Life at Sea, 1974 (1974 SOLAS Convention), as amended, and associated Codes (IBC, BCH, IGC and GC Codes). Although alarms and indicators required by the Codes on mobile offshore drilling units, nuclear merchant ships, dynamically supported craft and similar specialized vessels and also by MARPOL 73/78 are not specifically included, the Code can be used for guidance where appropriate, and in the future it could be extended to include these instruments. The Code can also be used for guidance for alarms and indicators fitted in excess of or in addition to those required by IMO instruments. It permits present practices in use in world fleets and provides flexibility for alternative methods. It is, however, intended to promote uniformity of the system between ships which will improve crew safety and training.

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

3 Although preference was given to promoting consistency of terminology with IMO instruments, harmonization with the contents of IEC publication 92-203:1985 "Electrical Installations in Ships. System Design - Acoustic and Optical Signals" was achieved as far as practicable.

4 It is recognized that changing technology and future amendments to the IMO instruments referred to in the Code will necessitate changes to the Code itself. Accordingly, the Organization will review the Code as necessary taking into account both amendments to IMO instruments and future development.

5 Administrations are encouraged to give wide dissemination of this Code to shipowners, operators, designers and other interested bodies.

1 Purpose and application

1.1 This Code is a recommendatory document for alarms and indicators. It is intended to provide general design guidance and to promote uniformity of type, location and priority for those alarms and indicators which are required by the 1974 SOLAS Convention, as amended, and associated Codes (IBC, BCH, IGC and GC Codes).

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

1.3 The Code applies to shipboard alarms and indicators on ships constructed on or after 1 July 1992. The Code also applies to major modifications to, or new installations of, alarms and indicators carried out on or after 1 July 1992.

## 2 Definitions

2.1 Alarm. An alarm or alarm system which announces by audible means, or audible and visual means, a condition requiring attention.

2.2 Emergency alarms. Alarms which indicate that immediate danger to human life or to the ship and its machinery exists and that immediate action must be taken. The following 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 muster stations.
- .2 Fire alarm. An alarm to summon the crew in the case of fire.
- .3 Those alarms giving warning of immediate personnel hazard, including:
  - .3.1 Fire-extinguishing medium alarm. An alarm warning of the imminent release of fire-extinguishing medium into a space.
  - .3.2 Power-operated sliding watertight door closing alarm. An alarm required by SOLAS regulation II-1/15.9.1, or SOLAS regulation II-1/15.7.1.6 for ships constructed on or after 1 February 1992, warning of the closing of a power-operated sliding watertight door.

2.3 Primary alarms. Alarms which indicate a condition that requires prompt attention to prevent an emergency condition. The following are classified as primary alarms:

- .1 Machinery alarm. An alarm which indicates a malfunction or other abnormal condition of the machinery and electrical installation.
- .2 Steering gear alarm. An alarm which indicates a malfunction or other abnormal condition of the steering gear system, i.e. 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 navigating bridge propulsion control failure alarm.
- .4 Bilge alarm. An alarm which indicates an abnormally high level of bilge water.
- .5 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.

- .6 Personnel alarm. An alarm to confirm the safety of the engineer on duty when alone in the machinery spaces.
  - .7 Fire detection alarm. An alarm to alert the crew on the navigating bridge, at the fire control station or elsewhere that a fire has been detected.
  - .8 Alarms indicating faults in emergency or primary alarm or detection systems or failure of their power supplies.
  - .9 Cargo alarm. An alarm which indicates abnormal conditions originating in cargo, or in systems for the preservation or safety of cargo.
  - .10 Gas detection alarm. An alarm which indicates that gas has been detected.
  - .11 Power-operated watertight door fault alarms. Alarms which indicate low level in hydraulic fluid reservoir, low gas pressure or loss of stored energy in hydraulic accumulators, and loss of electrical power supply for power-operated sliding watertight doors.
- 2.4 Secondary alarms. Alarms which are not included in 2.2 and 2.3.
- 2.5 Indicator. Visual indication giving information about the condition of a system or equipment.
- 2.6 Required alarm or indicator. An alarm or indicator required by IMO instruments referred to in 1.1 and 1.2. Any other alarms and indicators are referred to in this Code as non-required alarms or indicators.
- 2.7 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.
- 2.8 Accept. Manually acknowledge receipt of an alarm or call.
- 2.9 Cancel. Manual stopping of an alarm or call after the cause has been eliminated.
- 2.10 Grouping. Grouping is a generic term meaning:
- .1 the arrangement of individual alarms on alarm panels or individual indicators on indicating panels, e.g., steering gear alarms at the navigating bridge steering position, or door indicators on a watertight door position indicating panel;
  - .2 the combining of individual alarms to provide one alarm at a remote position, e.g., the machinery alarm at the engineers' accommodation or at the navigating bridge; and
  - .3 the arrangement of alarms in terms of their priority, e.g., emergency alarms, primary alarms, secondary alarms.

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

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

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

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

### 3 General

3.1 The presentation of alarms and indicators should be clear, unambiguous, and consistent.

3.2 All required alarms should be indicated by both audible and visual means, except the emergency alarms of 2.2 which should be indicated primarily by audible alarms. In machinery spaces with high ambient noise level, audible alarms should be supplemented by visual alarms in accordance with 5.1. Audible alarms may also be supplemented by visual alarms in accommodation spaces.

3.3 A new alarm condition should be clearly distinguishable from those existing and accepted, e.g., existing and accepted alarms are indicated by a constant light and new alarms are indicated by a flashing light. At control positions or other suitable positions as required, alarm systems should clearly distinguish between normal, alarm, and accepted alarm conditions.

3.4 Alarms should be maintained until they are accepted and the visual indications of individual alarms should remain until the fault has been corrected, when the alarm system should automatically reset to the normal operating condition. If an alarm has been accepted and a second fault occurs before the first is rectified, the audible and visual alarms are to operate again.

3.5 Alarms should only be capable of being cancelled if the condition causing them has been dealt with successfully.

3.6 Required alarm 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 primary alarms should be powered from the main source of electrical power and from emergency source 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 medium 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.

- 3.7 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 change-over to the emergency source of electrical power in case of loss of normal power supply.
- 3.8 Failure of the normal power supply of required alarm systems should be indicated by an audible and visual alarm.
- 3.9 Required alarm systems should, as far as is practicable, be designed on the fail-to-safety principle, e.g., an open detection circuit should cause an audible and visual alarm; see also SOLAS regulations II-2/13.1.2 and II-1/51.1.4.
- 3.10 Provision should be made for functionally testing required alarms and indicators. The Administration should ensure, e.g., by training and drills, that the crew is familiar with all emergency and primary alarms.
- 3.11 Required alarms and indicator systems should be functionally independent of control systems and equipment, or should achieve equivalent redundancy. Any additional requirements for particular alarms in the IMO instruments applicable to the ship should be complied with.
- 3.12 Computer programs for computerized alarm and indicator 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 computer programs.
- 3.13 Cables for emergency alarms and their power sources should be of a fire-resistant type and be run as directly as is considered practicable by the Administration. Equipment and cables for emergency alarms should be arranged to minimize risk of total loss of service due to localized fire, collision, flooding or similar damage.
- 3.14 To the extent considered practicable by the Administration, emergency alarms should be arranged so that the audible alarm signal can be heard regardless of failure of any one circuit or component.
- 3.15 Means should be provided to prevent normal operating conditions from causing false alarms, e.g., provision of time delays because of normal transients.
- 3.16 Alarms and indicators on the navigating bridge are to be minimized. Alarms and indicators which are not required alarms and indicators for the navigating bridge should not be placed on the navigating bridge, unless permitted by the Administration.
- 3.17 The system should be arranged so that all alarm signals can be accepted or cancelled at the appropriate control position only.
- 3.18 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).

4 Audible alarms and calls

4.1 Required alarms should be clearly audible and distinguishable in all parts of the spaces where they are called for. Where a distinct difference between the various audible alarms and calls cannot be determined satisfactorily, as in machinery spaces with high ambient noise levels, it is permitted, with the exception of the fire-extinguishing medium alarm, to install common audible alarm and call devices supplemented by visual alarms and indicators identifying the meaning of the audible alarm or call.

4.2 The fire-extinguishing medium alarm should have a characteristic which can be easily distinguished from any other audible alarm or call installed in the space(s) concerned, and should not be combined with any other audible alarm or call.

4.3 Audible alarms and calls should have characteristics in accordance with section 6.

4.4 In large spaces, more than one audible alarm 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.

4.5 Facilities for adjusting the frequency of audible alarms 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.

4.6 Arrangements should not be provided to adjust the sound pressure level of required audible alarms.

4.7 Administrations may accept electronically generated sound signals provided all applicable requirements herein are complied with.

4.8 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 alarms in chapters II and III of the 1974 SOLAS Convention, as amended, are met;
- .2 all the relevant requirements for required alarms 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, e.g., by the use of multiple amplifiers with segregated cable routes to public rooms, alleyways, stairways and control stations; use of more than one device for generating electronic sound signals; and use of electrical protection for individual loudspeakers against short circuits.

4.9 The general emergency alarm, fire alarm (if not incorporated in the general emergency alarm system), fire-extinguishing medium alarm, and

machinery alarm should be so arranged that the failure of the power supply or the signal generating and amplifying equipment (if any) to one will not affect the performance of the others.

4.10 The general emergency alarm should be audible in the spaces specified by SOLAS regulation III/50 with all doors and accesses closed.

4.11 In general, audible alarm sound pressure levels at the sleeping positions in the cabins and one metre from the source should be at least 75 dB(A) and at least 10 dB(A) above ambient noise levels existing during normal equipment operation with the ship under way in moderate weather. The sound pressure level should be in the 1/3-octave band about the fundamental frequency. In no case should audible alarm levels in a space exceed 120 dB(A).

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

## 5 Visual alarms, calls and indicators

5.1 Supplemental visual alarms 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 6.1.1-6.1.3;
- .3 flash in accordance with 5.2;
- .4 be of high luminous intensity; and
- .5 be provided in multiple in large spaces.

5.2 Flashing alarms 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.

5.3 Visual alarms and indicators on the navigating bridge should not interfere with night vision.

5.4 Alarms and indicators should be clearly labelled unless standard visual indicator symbols, such as those in tables 6.1.1-6.1.3, 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 6.1.1. Standard visual indicator symbols may also be used on consoles, indicator panels, or as labels for indicator lights.







5.5 Alarm and indicator colours should be in accordance with ISO Standard 2412 as deemed appropriate by the Administration.

## 6 Characteristics

6.1 The emergency and primary alarms and call signals listed should have the audible and visual characteristics shown in the tables of this section. All other alarms, 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 alarms may be added by the Administration in a manner consistent with this Code.

Table 6.1.1 - Emergency alarms






Note: see table 6.2 for audible codes.




Function		IMO instrument	Audible Device Code	Visual Colour Symbol*	Remarks
General emergency alarm		SOLAS III/50 III/6.4	Whistle Siren 1.a, Bell 1.b Klaxon Horn	Green/ White   passengers crew	Muster stations for passengers. Boat stations for crew.
Fire alarm	Other than in machinery space	SOLAS II-2/40.4 II-2/13	Bell Klaxon 2, Siren 1.b Horn	Red 	Fire stations for crew.
	In machinery space	SOLAS II-2/11.8 II-2/14	Bell Buzzer 2 Horn	Red  	Horn/bell in machinery space, buzzer/bell elsewhere.
Fire-extinguishing medium release alarm		SOLAS II-2/5.1.6	Siren 2 Horn	Red 	Signal precedes release. Audible signal distinct from all others.
Power-operated sliding watertight door closing alarm		SOLAS II-1/15.9.1; for ships constructed on or after 1 February 1992 II-I/15.7.1.6 and 15.8.2	Horn 2 Klaxon Bell	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. On ships constructed on or after 1 February 1992, red indicator on navigating flashes while door closes.

\* For use with alarm indicator columns.

**Table 6.1.2 - Primary alarms**

Note: see table 6.2 for audible codes.

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 29.8.4 29.12.2 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	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	Resolution A.481(XII), paragraph 7.3	Horn Buzzer	3	Amber		Horn in machinery space, buzzer elsewhere.



Function	IMO instrument	Audible		Visual		Remarks
		Device	Code	Colour	Symbol*	
Fire detection alarm	SOLAS II-2/12	Bell Buzzer Horn	2	Red		
	SOLAS II-2/13	Ditto	2	Red		Should automatically actuate fire alarm if not accepted in 2 minutes or less. Horn/bell in machinery space, buzzer/bell elsewhere.
	SOLAS II-2/13-1 for ships constructed on or after 1 February 1992	Ditto	2	Red		

Function		IMO instrument	Audible Device Code	Visual Colour Symbol*	Remarks
Alarm system fault alarm		II-1/51.2.2	Horn 3 Buzzer	Amber No symbol allocated	Horn in machinery space, buzzer elsewhere
Cargo alarm		IBC, BCH IGC, GC	Horn 3 Buzzer	Amber No symbol allocated	See tables 9.1.1-9.1.8 for IMO instrument references. Horn in machinery space; buzzer in engine control room, cargo control station and navigating bridge.
Gas detection alarm	For chlorine gas	IGC 17.14.4.3 17.14.1.4 GC 17.12.5(d)(iii) 17.12.5(a)(iv)	Siren 2 Horn Bell	Red <b>GAS</b> Cl	
	Except for chlorine gas	IGC 13.6.17.9, 16.2.1.2,16.2.9 GC 13.6, 17.11, 16.2(b),16.10	Buzzer 3 Horn	Amber <b>GAS</b> xxx	xxx Gas abbreviation may be indicated
Power-operated sliding water- tight door fault alarm		SOLAS II-1/15.7.3 15.7.8 for ships cons- tructed on or after 1 February 1992	Horn 3 Buzzer	Amber No symbol allocated	Horn in machinery spaces, buzzer elsewhere

\* For use with alarm indicator columns

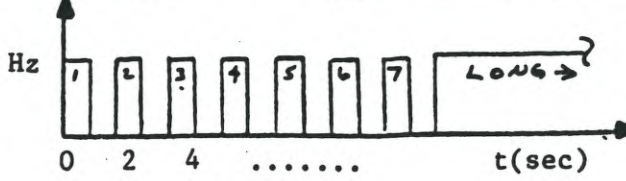
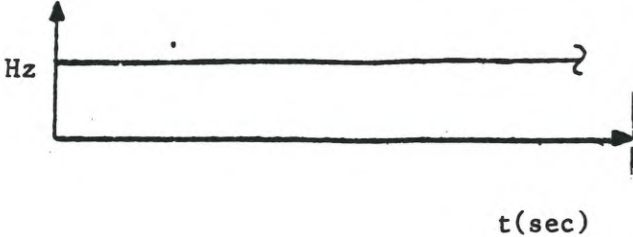
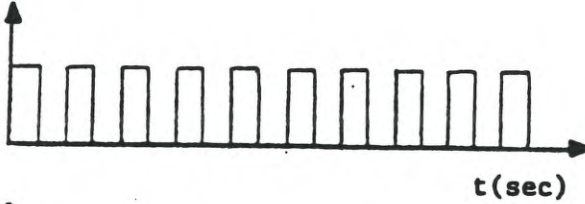

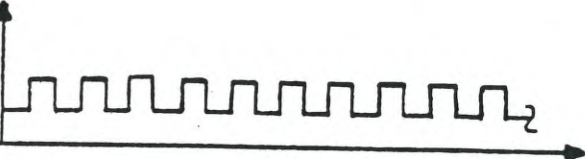
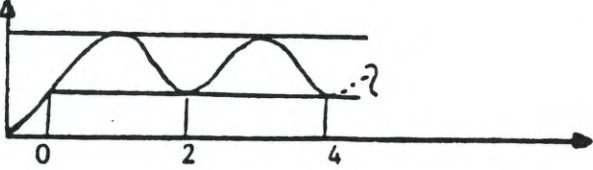
**Table 6.1.3 - Call signals**

Note: see table 6.2 for audible codes.

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 navigating 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 navigating bridge.

\* For use with alarm indicator columns.

Table 6.2 - Audible alarm and call waveforms

AUDIBLE CODE	WAVEFORM	REMARKS
1.a.		General emergency alarm
1.b.	Specific codes per muster list.	
2.		Continuous until cancelled or accepted
3.a.		Optional waveforms to provide distinction between alarms. To be used consistently for primary and secondary alarms. Pulse frequency between 0.5 Hz and 2.0 Hz.
3.b.		
3.c.		
3.d.		

## 7 Requirements for particular alarms

### 7.1 Personnel alarm

7.1.1 The personnel alarm should automatically give an alarm on the navigating bridge or in the officers' quarters as appropriate, if it is not reset from the machinery spaces in a period satisfactory to the Administration, but not exceeding 30 minutes.

7.1.2 A pre-warning signal should be provided in the machinery spaces which operates 3 minutes before the alarm required by 7.1.1 is given.

7.1.3 The alarm system is to be put into operation:

- .1 automatically when the engineer on duty has to attend machinery spaces in case of a machinery alarm; or
- .2 manually by the engineer on duty when attending machinery spaces on routine checks.

7.1.4 The alarm system is to be disconnected by the engineer on duty after leaving the machinery spaces. When the system is brought into operation in accordance with 7.1.3.1, disconnection should not be possible before the engineer has accepted the alarm in the machinery spaces.

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

### 7.2 Engineers' alarm

In addition to manual operation from the machinery space, the engineers' alarm on vessels with periodically unattended machinery spaces should operate when the machinery alarm is not accepted in the machinery spaces or control room in a specified period of time, e.g. two minutes.

## 8 Grouping of alarms and indicators

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

8.2 The scope of alarms and indicators will vary with the type of ship and machinery. The basic recommendations given in tables 8.1 through 8.3 should be adhered to.

8.3 When visual alarms are grouped in accordance with 2.10.2, individual alarms should be provided at the appropriate position to identify the specific alarm condition.

8.4 The purpose of grouping is to achieve the following:

- .1 In general: to reduce the variety in type and number of audible and visual alarms and indicators so as to provide quick and unambiguous information to the personnel responsible for the safe operation of the ship.
- .2 On the navigating bridge:
  - .2.1 to enable the officer on watch to devote full attention to the safe navigation of the ship;
  - .2.2 to readily identify any abnormal situation requiring action to maintain the safe navigation of the ship; and
  - .2.3 to avoid distraction by alarms 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, 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 for remedial action to be assessed.
- .4 In the engineers' public rooms and to 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 alarm situation which requires immediate presence in the machinery space/engine control room.

Table 8.1

Grouping of alarms and indicators  
Machinery space attended  
Remote control of the main propulsion machinery from  
the navigating bridge not provided

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Navigating bridge		Machinery space
One common audible alarm device, except emergency alarms (e.g. buzzer, continuous)		Audible alarm devices in accordance with sections 4, 6 and 8.
1	2	3
Main steering position	Other locations on navigating bridge	Machinery space or control room
Individual visual alarms 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 alarms and indicators at any position on the navigating bridge other than the main steering position for:  Required alarms and indicators, as indicated under 'NOTES' in table 9.1.1.  Any non-required alarm or indicator which the Administration considers necessary for the officer on watch  Fire detection alarm	Visual alarms 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 8.4.3.  Alarms and indicators as indicated under 'NOTES' in table 9.1.2.  Engine-room telegraph

Table 8.2

Grouping of alarms and indicators  
Machinery space attended  
Remote control of the main propulsion machinery from  
the navigating bridge provided

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Navigating bridge		Machinery space
One common audible alarm device, except emergency alarms (e.g. buzzer, continuous)		Audible alarm devices in accordance with sections 4, 6 and 8.
1	2	3
Main steering position	Other locations on navigating bridge	Machinery space or control room
Individual visual alarms and indicators as in column 1, table 8.1, plus:  Failure of remote control for main propulsion machinery  Starting air low pressure, when the engine can be started from the navigating bridge  Propulsion station in control	Visual alarms and indicators at any position on the navigating bridge other than the main steering position as in column 2 of table 8.1, plus:  Machinery alarm, if provided	Alarms and indicators as in column 3 of table 8.1, plus:  Failure of remote control for main propulsion machinery  Starting air low pressure  Propulsion station in control  Indication of propulsion machinery orders from navigating bridge  Alarms and indicators as indicated under 'NOTES' in table 9.1.2

Grouping of alarms and indicators  
Machinery space unattended  
Remote control of the main propulsion machinery from the navigating bridge provided

Navigating bridge		Machinery space	
One common audible alarm device, except emergency alarms (e.g. buzzer, continuous)		Audible alarm devices in accordance with sections 4, 6 and 8	
1	2	3	4
Main steering position	Other locations on navigating bridge	Machinery space or control room	Engineers' public spaces and accommodations
Individual visual alarms and indicators as in column 1 of tables 8.1 and 8.2, plus:  Override of automatic propulsion shutdown, if provided	Visual alarms and indicators at any position on the navigating bridge other than the main steering position as in column 2 of tables 8.1 and 8.2, plus:  Machinery space fire detection alarm  Alarm conditions requiring action by or the attention of the officer on watch on the navigating bridge  Alarms and indicators as in- dicated under 'NOTES' in table 9.1.1	As in column 3, tables 8.1 and 8.2, plus:  Alarms as indicated under 'NOTES' in table 9.1.2  Alarm 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  Alarms and indicators under 'NOTES' in table 9.1.5

\* Alarm may be common.

9 Alarm and indicator locations

9.1 Required alarms and indicator type and location should be in accordance with tables 9.1.1-9.1.8.

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

Notes to be applied to tables 9.1.1-9.1.8:

- (1) A - audible alarm (visual may be necessary in high noise areas)  
V - visual alarm  
I - visual indicator  
A,V - both audible and visual alarms should be provided  
MI - measuring indicator  
EM - emergency alarm  
P - primary alarms and additional indicators  
S - secondary alarms and additional indicators
- (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 alarm 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 alarm or indication should be given at the gas detector device readout location.
- (4) Where the types of alarms are not specifically identified in the IMO instruments referred to, the recommendations of the IMO Sub-Committee on Bulk Chemicals are enclosed in parentheses, e.g. (A,V).

Table 9.1.1 LOCATION - NAVIGATING BRIDGE

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	29.11	Rudder angle indicator	MI	Column 1, table 8.1
P	29.5.2	Steering gear power	A,V	Ditto
	30.3	unit power failure		
P	29.8.4	Steering control system power failure	A,V	Ditto
P	29.12.2	Low steering gear hydraulic fluid level	A,V	Ditto
P	30.1	Steering gear running	I	Column 1, table 8.1
P	51	Steering gear overload alarm	A,V	Column 1, table 8.3
P	31.2.7	Propulsion machinery remote control failure	A,V	Column 1, table 8.2
	49.5			
P	31.2.9	Low propulsion starting air pressure	A,V	Ditto
	49.7			
P	52	Automatic propulsion shutdown override	I	Column 1, table 8.3
P	52	Automatic shutdown of propulsion machinery	A,V	ditto
P	51.1.3	Fault requiring action by or attention of the officer on watch	A,V	Column 1, table 8.3 (machinery alarm including 53.4.2 and 53.4.3)
P	31.2.8	Propeller speed/direction/pitch	MI	Column 1, table 8.2
P	49.6	Propeller speed/direction/pitch	MI	Column 1, table 8.3
P	37	Engine room telegraph	I	Ditto
P	15.9.2	Power available for watertight doors	I	Column 2, table 8.1
P	16.2	Watertight door position	I	Ditto; if central operating station is on navigating bridge.
	15.6.5			
	15.11.1.1			
P	**15.6.4	Watertight door position	I	Column 2, table 8.1
	**15.8.2			
	16.2			
P	**15.7.3.1	Watertight door low hydraulic fluid level	A,V	Ditto
P	**15.7.3.1	Watertight door low gas pressure, loss of stored energy	A,V	Ditto
	**15.7.3.2			
P	**15.7.8	Watertight door electrical power loss	A,V	Ditto

Table 9.1.1 LOCATION - NAVIGATING BRIDGE (cont.)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	**21.1.6.2	High water level alarm	A	!, where required.
P	**23-1.2	Watertight door position	I	Column 2, table 8.1 Recommended colours: red - door is not fully closed or not secured, green - door fully closed and secured.
P	**23-2.1	Shell door position indicator	I	Column 2, table 8.1, passenger ships with ro-ro cargo spaces or special category spaces. Recommended colours: red - door is not fully closed or not secured, green - door fully closed and secured.
P	**23-2.2	Water leakage detection indicator		Column 2, table 8.1, passenger ships with ro-ro cargo spaces or special category spaces. For details see regulation 23-2.2.
S	31.2.5	Propulsion control station in control	I	Column 1, table 8.2
P	49.3 51.2.2	Alarm system normal power supply failure	A,V	Column 2, table 8.3
	<u>SOLAS II-2</u>			
EM	+5.3.4.3	Local auto halon release	A,V	Column 2, table 8.1
P	11.8 14.2	Fire detection in automated or remotely controlled machinery space	A,V	Column 2, table 8.2
P	12.1.2 +12.1.2.1 12.1.2.2 +13.1.5 13.1.6	Fire detection or auto sprinkler operation	A,V	Column 2, table 8.1

Table 9.1.1 LOCATION - NAVIGATING BRIDGE (cont.)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
P	12.1.2 +12.1.2.1 12.1.2.2 13.1.2 +13.1.5	Fire detection system fault	A,V	Column 2, table 8.1
P	**13-1.1.3	Smoke detection system power loss	A,V	Ditto
P	+,**13-1.1.6 +,**13-1.3.4	Smoke detection	A,V,I	Ditto
P	+5.3.3.8	Loss of halon container pressure	A,V	Ditto
P	+5.3.3.2	Halon system electric circuit fault or power loss	A,V	Ditto
P	+5.3.3.3	Halon system hydraulic or pneumatic pressure loss	A,V	Ditto
S	37.1.6.3 38.3.3 53.2.3.3	Loss or reduction of required ventilation	I	Ditto
S	37.1.2.2	Fire door position	I	Ditto
S	62.16.3.1	Inert gas supply main pressure	MI	Ditto; forward of non-return devices.
S	62.16.3.1	Inert gas pressure	MI	Column 2, table 8.1 In slop tanks of combination carriers.
P	<u>Resolution A.481(XII) Paragraph 7.3</u>	Personnel alarm	A,V	Column 2, table 8.1
S	<u>SOLAS III 15.9</u>	Position of stabilizer wings	I	Ditto
P	<u>SOLAS IV 11(a)(vi) 18(a)</u>	Radiotelegraph/radiotele- phone alarm and failure of apparatus	A	Ditto
S	<u>SOLAS V 12(m)</u>	Pitch of lateral thrust propeller	MI	Column 1, table 8.1

Table 9.1.1 LOCATION - NAVIGATING BRIDGE (cont.)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>Gas or Chemical Codes</u>			Column 2, table 8.1 for the following:
P	IBC 15.2.4 BCH 4.19.4	High and low temperature of cargo and high temperature of heat exchanging medium	A,V	Ammonium nitrate solution
P	IBC 15.5.6 BCH 4.20.6	High temperature in tanks	A,V MI	Hydrogen peroxide solution over 60% but not over 70%.
P	IBC 15.5.7 BCH 4.20.7	Oxygen concentration in void spaces	A,V MI	Hydrogen peroxide solution over 60% but not over 70%.
P	IBC 15.8.23.1 BCH 4.7.15(a)	Malfunctioning of temperature controls of cooling systems	(A,V)	!, propylene oxide.
P	IGC 13.4.1 GC 13.4.1	High and low pressure in cargo tank	A,V	High and low pressure alarms.
P	IGC 13.6.4, 17.9 GC 13.6.4, 17.11	Gas detection equipment	A,V	
P	IGC 13.5.2, GC 13.5.2	Hull or insulation temperature	A,(V),MI	!
P	IGC 17.18.4.4 GC 17.12.2(d)(iv)	Cargo high pressure, or high temperature at discharge of compressors	A,V	Methyl acetylene-propadiene mixtures
P	IGC 17.14.4.3 GC 17.12.5(d)(iii)	Gas detecting system monitoring chlorine concentration	A,V	!
P	IGC 17.14.4.4 GC 17.12.5(d)(iv)	High pressure in chlorine cargo tank	A,(V)	!
P	IBC 15.5.18 BCH 4.20.19	High temperature in tanks	A,V,MI	
P	IBC 15.5.19 BCH 4.20.20	Oxygen concentration in void spaces	A,V,MI	
P	IBC 15.10.2 BCH 4.3.1(b)	Failure of mechanical ventilation of cargo tanks	(A,V) (A,V)	! !
P	IBC 19.8.4	Low pressure in inerted cargo tanks	A,V	!
P	IGC 5.2.1.7 GC 5.2.5(b)	Liquid cargo in the ventilation system	(A,V)	

Table 9.1.1 LOCATION - NAVIGATING BRIDGE (cont.)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>Gas or Chemical Codes</u>			Column 2, table 8.1 for the following:
P	IGC 8.4.2.1 GC 8.4.2(a)	Vacuum protection of cargo tanks	(A,V)	!
P	IGC 9.5.2 GC 9.5.2	Inert gas pressure monitoring	(A,V)	!
P	IGC 13.6.11 GC 13.6.11	Gas detection equipment	A,V	!
P	IGC 17.14.1.4 GC 17.12.5(a)(iv)	Gas detection after bursting disk for chlorine	(A,V)	!

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

\*\* Applicable to ships constructed on or after 1 February 1992.

! No location specified in other IMO instruments. Location is recommended.

Table 9.1.2 LOCATION - MACHINERY SPACE/MACHINERY CONTROL ROOM

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	29.12.2	Low steering gear fluid level	A,V	Column 3, table 8.1
P	30.1	Steering gear running	I	Ditto
P	30.3	Steering system electric phase failure or overload	A,V	Ditto
P	31.2.7 49.5	Propulsion machinery remote control failure	A,V	Column 3, table 8.2
P	31.2.9 49.7	Low propulsion starting air pressure	A,V	Ditto
P	32.2	Oil fired boiler low water level, air supply failure, or flame failure	A,V	Column 3, table 8.1
P	32.3	Propulsion boiler high water level	A,V	Ditto
S	31.2.5 49.3	Propulsion control station in control	I	Column 3, table 8.2
P	37	Engine room telegraph	I	Column 3, table 8.1
S	31.2.4 49.2	Propulsion machinery orders from bridge	I	Column 3, table 8.2
P	47.1.1 47.1.2	Boiler and propulsion machinery internal fire	A,V	Column 3, table 8.3
P	47.2	Internal combustion engine monitors	MI	Ditto
P	48.1, 48.2	Bilge monitors	A,V	Ditto
P	51.2.2	Alarm system normal power supply failure	A,V	Ditto
P	53.4.3 51.1.1	Essential and important machinery parameters	A,V	Column 3, table 8.3 (machinery alarm)
S	42.5.3 43.5.3	Emergency battery discharge	I	Column 3, table 8.1
P	52	Automatic shutdown of propulsion machinery	A,V	Column 3, table 8.3
P	52	Automatic propulsion shutdown override	I	Ditto
P	53.4.2	Automatic change-over of propulsion auxiliaries	A,V	Ditto
S	45.4.2	Electrical distribution system low insulation level	1 or I	!,column 3, table 8.1

Table 9.1.2 LOCATION - MACHINERY SPACE/MACHINERY CONTROL ROOM

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-2</u>			
P	5.3.3.2	Halon system electric circuit fault or power loss	A,V	Column 3, table 8.1
P	5.3.3.3	Halon system hydraulic or pneumatic pressure loss	A,V	Column 3, table 8.1
P	11.8 14.2	Fire detection in automated or remotely controlled machinery space	A,V	Column 3, table 8.2
P	15.5.1	High pressure fuel oil leakage	A,V	Column 3, table 8.3
P	15.5.3	Service fuel oil tank high temperature	A,V	Ditto
P	62.19.6	Inert gas system:	A,V	Column 3, table 8.1
	62.19.1.1	-low water pressure/flow		
	62.19.1.2	-high water level		
	62.19.1.3	-high gas temperature		
	62.19.1.4	-blower failure		
	62.19.1.5	-oxygen content		
	62.19.1.6	-power supply failure		
	62.19.1.7,	-water seal low level		
	62.19.7			
	62.19.1.8,	-low gas pressure		
	62.19.8			
	62.19.1.9	-high gas pressure		
	62.19.2	gas generator failure:		
	62.19.2.1	-low fuel supply		
	62.19.2.2	-power supply failure		
	62.19.2.3	-control power failure		
S	62.16.3.2	Inert gas O <sub>2</sub> content	MI	Ditto
	<u>Gas or Chemical Codes</u>			
P	IGC 16.2.1.1 GC 16.2(a)	Loss of inert gas pressure between pipes	A,V	!, column 3, table 8.1
P	IGC 16.2.9 GC 16.10	Cargo gas/fuel system gas detection	A,V	!, ditto
P	IGC 16.2.1.2 GC 16.2(b)	Flammable gas in ventilation duct	(A,V)	!, ditto
P	IGC 16.2.4 GC 16.5	Flammable gas in ventilation casing	(A,V)	!, ditto
	<u>Resolution A.481(XII)</u>			
P	<u>Paragraph 7.3</u>	Personnel alarm	A,V	Column 3, table 8.1

! No location specified in other IMO instruments. Location is recommended.

Table 9.1.3 LOCATION - CENTRAL FIRE CONTROL STATION WHERE PROVIDED

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-2</u>			
EM	+ 5.3.4.3	Local automatic halon operation	A,V	
P	+ 5.3.3.8	Loss of halon container pressure	A,V	
P	+ 11.8 14.2	Fire detection in automatic or unattended machinery space	A,V	
S	12.2.3	Automatic sprinkler system pressure	MI	
P	12.1.2 +12.1.2.1 +13.1.5 13.1.6	Fire detection or automatic sprinkler operation	A,V	
P	12.1.2 +12.1.2.1 13.1.2 +13.1.5	Fire detection system fault	A,V	
P	+,**13-1.1.3	Smoke detection system power loss	A,V	
P	+,**13-1.1.6 +,**13-1.3.4	Smoke detection	A,V,I	

+ May be omitted if provided on the navigating bridge.

\*\* Applicable to ships constructed on or after 1 February 1992.

Table 9.1.4 LOCATION - AT THE EQUIPMENT OR AT THE LOCATION BEING MONITORED

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	29.11	Rudder angle indicator	MI	
S	17.9.2.1	Shell valve closure	I	
S	17.9.3			
S	32.6	Water level of essential boiler	MI	
EM	15.9.1 **15.7.1.6	Watertight door closing	A	**Distinct from other alarms in area; in passenger areas and high noise areas, add intermittent visual alarm.
P	**15.7.3.2	Watertight door loss of stored energy	A,V	At each local operating position
S	33.3	Steam pressure	MI	
	<u>SOLAS II-2</u>			
EM	5.3.4.3	Local automatic halon release	A,V	Outside each access to the protected space
EM	5.1.6 63.1.1.1 IBC 11.2.1.2 BCH 3.13.3(b)	Release of fire-extinguishing medium	A	
P	5.3.3.8	Loss of halon container pressure	A,V	
S	12.2.3	Automatic sprinkler system pressure	MI	At each section stop valve
S	12.4.1	Automatic sprinkler system tank level	MI	
S	15.2.6	Fuel oil tank level	MI	If provided
S	**15.2.6.1.1	Oil tank level	MI	
S	**15.2.6.2			
S	62.5	Flue gas isolating valve open/closed	I	
S	62.15	Inert gas discharge temperature/pressure	MI	Measured at discharge of gas blower
	<u>SOLAS IV</u>			
S	15(e)	Condition of batteries	I	At radiotelephone station

Table 9.1.4 LOCATION - AT THE EQUIPMENT OR AT THE LOCATION BEING MONITORED  
 (continued)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>Gas or Chemical Codes</u>			
P	IBC 19.4.5	High temperature on outside furnace surfaces of incinerator	(A,V) MI	!
P	IGC 9.5.1 GC 9.5.1	Content of oxygen in inert gas/trace of oxygen in nitrogen	(A,V) MI	!
S	IGC 3.6.3 GC 3.6.3	Warning on both sides of the airlock	A,V	
S	IGC 8.2.8.2 GC 8.2.8(b)	Indicates which one of the pressure relief valves is out of service	I	
EM	IGC 11.5.2 GC 11.5.2	Inerting/extinguishing medium release	A	Gas-dangerous enclosed spaces
S	IGC 13.4	Cargo pressure	MI	Local gauges required by 13.4.1, 13.4.2, 13.4.3 and 13.4.4
P	IGC 13.6, 17.9 GC 13.6, 17.11	Gas detection equipment	A,V	

\*\* Applicable to ships constructed on or after 1 February 1992.

! No location specified in other IMO instruments. Location is recommended.

Table 9.1.5 LOCATION - ENGINEERS' ACCOMMODATION

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	38	Engineers' alarm	A	Column 4, table 8.3
P	51.1.2 51.1.5	Fault requiring attention of the engineer on duty	A,V	Ditto (machinery alarm)
	<u>SOLAS II-2</u>			
P	11.8 14.2	Fire detection in automated or remotely controlled machinery space	A,V	Ditto
	<u>Resolution A.481(XII)</u>			
P	<u>Paragraph 7.3</u>	Personnel alarm	A,V	Column 4, table 8.3 (when the navigating bridge is unmanned)

Table 9.1.6 LOCATION - MISCELLANEOUS

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-1</u>			
P	15.6.5 **15.6.4	Watertight door position	I	At operating stations from which the door is not visible. ** At all remote operating positions
S	21.2.12	Bilge cocks and valves position	I	At their place of operation
	<u>SOLAS II-2</u>			
P	12.1.2.2	Fire detection or automatic sprinkler operation	A,V	On cargo ships, alarm at attended location other than navigating bridge
P	11.8	Fire detection in	A,V	Alarm at attended location
	14.2	automated or unattended machinery space		when navigating bridge is unmanned
P	40.3 13.1.6	Fire detection alarm	A,V	Alarm at location easily accessible to crew at all times
EM	40.4	Fire (special alarm to summon crew)	A	May be part of general emergency alarm
EM	13.1.4	Fire detection alarm not receiving attention	A	Alarmed to crew; may be part of general emergency alarm
P	59.3.3	Flammable vapour monitoring	MI	
	<u>SOLAS III</u>			
EM	6.4.2, 50	General emergency alarm	A	Throughout all the accommodation and normal crew working spaces
	<u>SOLAS IV</u>			
P	11(a)(vi) 18(a)	Radiotelegraph/radio-telephone alarm and failure of apparatus	A	In the radio room and radio officer cabin

\*\* Applicable to ships constructed on or after 1 February 1992.

Table 9.1.7 LOCATION - CARGO CONTROL STATION

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
	<u>SOLAS II-2</u>			
P	+59.1.6	Cargo tank high level alarm and gauging	A,I	!, if required
S	62.16.1.1 62.16.2	Inert gas pressure	MI	
S	62.16.1.2 62.16.2	Inert gas O <sub>2</sub> content	MI	
P	62.19.6 62.19.1.1	Inert gas system: - low water pressure/ flow	A,V	
	62.19.1.2	- high water level		
	62.19.1.3	- high gas temperature		
	62.19.1.4	- blower failure		
	62.19.1.5	- oxygen content		
	62.19.1.6	- power supply failure		
	62.19.1.7	- water seal low level		
	62.19.7			
	62.19.1.8	- low gas pressure		
	62.19.8			
	62.19.1.9	- high gas pressure		
	62.19.2	Gas generator failure:		
	62.19.2.1	- low fuel supply		
	62.19.2.2	- power supply failure		
	62.19.2.3	- control power failure		
	<u>Gas or Chemical Codes</u>			
P	IBC 8.1.2 BCH 2.13.1	High level of the liquid in any tank	A,V	!,(2)
S	IBC 15.10.2 BCH 4.3.1(b)	Failure of mechanical ventilation system for maintaining low gas concentration in cargo tanks	A,V	!,sulphur liquid
P	IBC 15.19.2 BCH 4.14.3	Power failure on any system essential for safe loading	A,V	!,(2)
P	IBC 15.19.6 BCH 4.14.1	High level alarm, cargo tank	A,V	!,(2)
S	IGC 13.2.1 GC 13.2.1	Cargo level	MI	(2)
P	IGC 13.4.1 GC 13.4.1	High and low pressure in cargo tank	(A,V),MI	(2)

Table 9.1.7 LOCATION - CARGO CONTROL STATION (CONTINUED)

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
P	IGC 13.6.4, 17.9	Gas detection equipment	A,V	(3)
P	GC 13.6.4, 17.11			
P	IGC 17.18.4.4	Cargo high pressure, or high temperature at discharge of compressors	A,V	(2), methyl acetylene- propadiene mixtures
S	GC 17.12.2(d)(iv)			
S	IGC 10.2.2	Shutdown of submerged	(A,V)	
P	GC 10.2.2	cargo pumps		
P	IGC 17.14.4.3	Gas detecting system	A,V	!, (3)
	GC	monitoring chlorine		
	17.12.5(d)(iii)	concentration		
P	IGC 17.14.4.4	High pressure in cargo	A,(V)	!, (2)
	GC 17.12.5(d)(iv)	tanks (chlorine)		
P	IGC 13.3.1	High liquid level in	A,V	!, (2)
	GC 13.3.1	cargo tank		
S	IGC 13.5.1	Cargo temperature	MI	!, (2)
	GC 13.5.1			
P	IGC 13.5.2	Hull or insulation	MI,A,	!
	GC 13.5.2	temperature	(V)	
P	IGC 13.5.3	Cargo tank temperature	MI	!, (2)
	GC 13.5.3			
P	IGC 13.6.11	Gas detection equipment	A,V,MI	!, (3)
	GC 13.6.11			
P	IGC 17.14.1.4	Gas detection after	(A,V)	!, (2)
	GC 17.12.5(a)(iv)	bursting disc for	MI	
		chlorine		
P	IBC 10.2.2.1	Shutdown of submerged	(A,V)	
		cargo pumps		
P	IBC 15.7.10	High level of phosphorus	(A,V)	!, (2)
	BCH 4.5.10			
P	IBC 15.19.7.2	Overflow alarm	A,V	!
	BCH 4.14.2(b)			
P	IGC 5.2.1.7	Liquid cargo in the	(A,V)	!, (2)
	GC 5.2.5(b)	vent system		
P	IGC 8.4.2.1	Vacuum protection of	(A,V)	!, (2)
	GC 8.4.2(a)	cargo tanks		
P	IGC 9.5.2	Inert gas pressure	(A,V)	!
	GC 9.5.2	monitoring		

! - No location specified in other IMO instruments. Location is recommended.

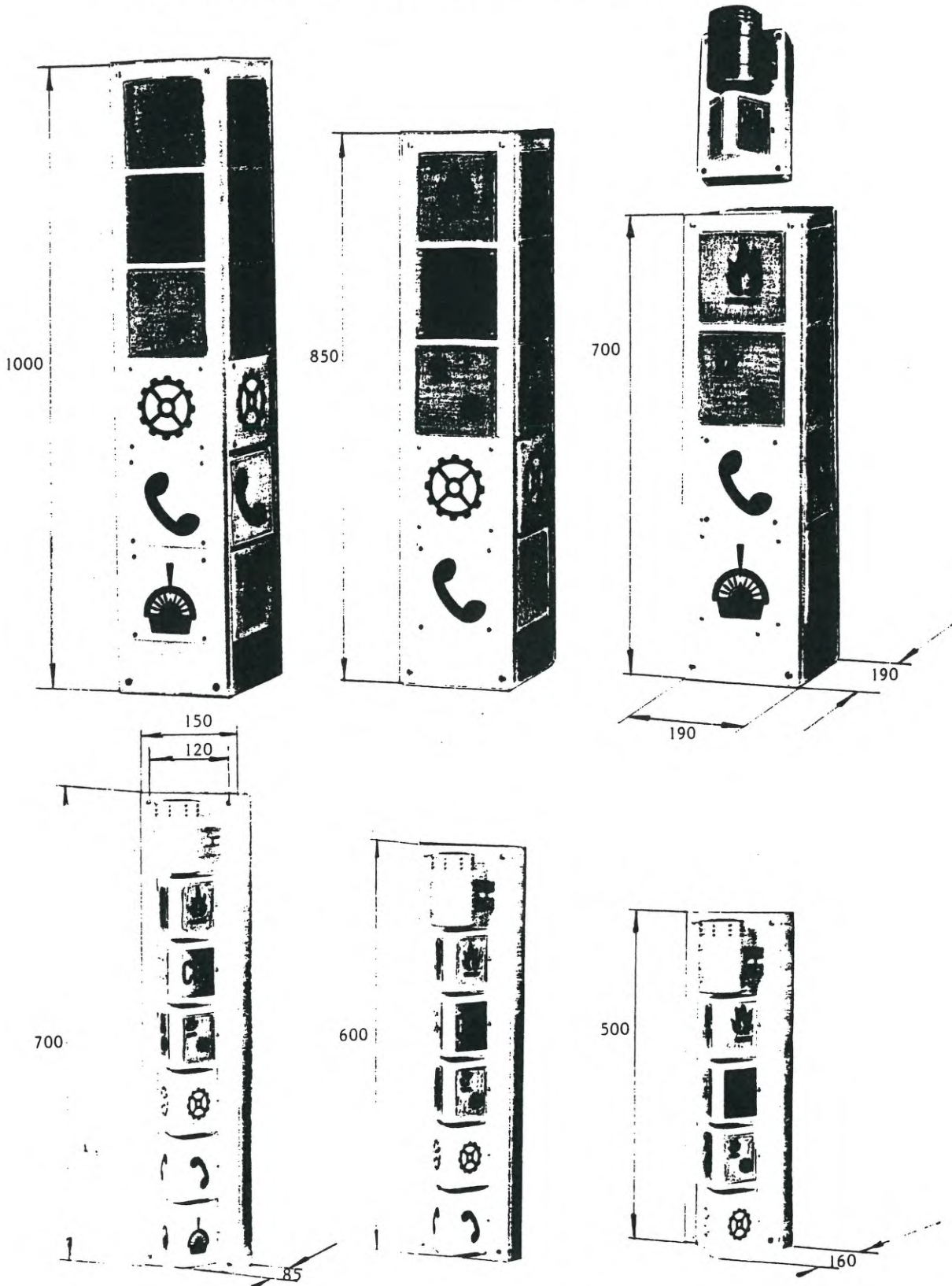
(2) and (3) - See notes following paragraph 9.2.

Table 9.1.8 LOCATION - NOT INDICATED BY IMO INSTRUMENTS

PRIORITY	IMO INSTRUMENT	FUNCTION	TYPE	NOTES
S	<u>SOLAS II-1</u> 8.7.3	Draught indicator	MI	Passenger ships only (if required). For details see regulation 8.7.3
P	<u>Gas or Chemical Codes</u> IBC 7.1.5 BCH 2.15.5(a)	Monitoring of cargo temperature	A,V, MI	Alarm system only required if overheating or overcooling could result in a dangerous condition
P	IBC 13.1.1 BCH 3.9	Cargo tank levels	MI	
P	IBC 15.7.7 BCH 4.5.7	High temperature of phosphorus	A,V	

APPENDIX

SAMPLES OF INDICATOR COLUMNS WITH DIMENSIONS (in millimetres)



NOTE: Diagrams above are representative only. Symbols should be as in tables 6.1.1-6.1.3.

