

CHAPTER 15

OPERATING COMPARTMENT LAYOUT

EU Directive on Electromagnetic Compatibility (2004/108/EC)

Electrical and electronic equipment fitted to Community Craft that may either generate or be affected by electromagnetic disturbance shall meet the requirements of EU Directive 2004/108/EC, as amended. Equipment complying with this directive should have an EC mark or CE marking in accordance with EU Directives 2004/108/EC or 93/68/EEC (with Corrigendum), as amended.

EU Directive on Electrical Equipment designed for use within certain voltage limits (2006/95/EC)

Electrical Equipment designed for use with a voltage rating of between 50 and 1000 volts for alternating current and between 75 and 1500 volts for direct current shall meet the requirements of EU Directive 2006/95/EC, except for specialised electrical equipment, for use on ships, which comply with the safety provisions drawn up by international bodies in which the Member States participate.

15.1 Definitions

15.1.1 "Operating area"* is the operating compartment and those parts of the craft on both sides of, and close to, the operating compartment which extend to the craft's side.

* Refer to Ship's Bridge Layout and Associated Equipment - Requirements and Guidelines (ISO 8468:1990); and the Guidelines on ergonomic criteria for bridge equipment and layout (MSC/Circ.982).

Note: use latest edition of ISO 8468, currently 2007.

15.1.2 "Workstation" is a position at which one or several tasks constituting a particular activity are carried out.

15.1.3 "Docking workstation" is a place equipped with necessary means for docking the craft.

15.1.4 "Primary controls" are all control equipment necessary for the safe operation of the craft when it is under way, including those required in an emergency situation.

15.2 General

The design and layout of the compartment from which the crew operate the craft shall be such as to permit operating crew members to perform their duties in a correct manner without unreasonable difficulty, fatigue or concentration, and to minimize the likelihood of injury to operating crew members in both normal and emergency conditions.

15.3 Field of vision from the operating compartment

15.3.1 The operating station shall be placed above all other superstructures so that the operating crew are able to gain a view all round the horizon from the navigating workstation. Where it is impractical to meet the requirements of this paragraph from a single navigating

workstation, the operating station shall be designed so that an all-round view of the horizon is obtained by using two navigating workstations combined or by any other means to the satisfaction of the Administration.

15.3.2 Blind sectors shall be as few and as small as possible, and not adversely affect the keeping of a safe look-out from the operating station. If stiffeners between windows are to be covered, this shall not cause further obstruction inside the wheelhouse.

15.3.3 The total arc of blind sectors from right ahead to 22.5° abaft the beam on either side shall not exceed 20°. Each individual blind sector shall not exceed 5°. The clear sector between two blind sectors shall not be less than 10°.

15.3.4 Where it is considered necessary by the Administration, the field of vision from the navigating workstation shall permit the navigators from this position to utilize leading marks astern of the craft for track monitoring.

15.3.5 The view of the sea surface from the operating station, when the navigators are seated, shall not be obscured by more than one craft length forward of the bow to 90° on either side irrespective of the craft's draught, trim and deck cargo.

15.3.6 The field of vision from the docking workstation, if remote from the operating station, shall permit one navigator to safely manoeuvre the craft to a berth.

Refer to BS EN ISO 8468, Ship's bridge layout and associated equipment – Requirements and guidelines.

15.4 Operating compartment

The term "operating compartment" is defined in 1.4.43, and the term "operating station" in 1.4.44.

15.4.1 The design and arrangement of the operating compartment, including location and layout of the individual workstations, shall ensure the required field of vision for each function.

15.4.2 The craft's operating compartment shall not be used for purposes other than navigation, communications and other functions essential to the safe operation of the craft, its engines, passengers and cargo.

15.4.3 The operating compartment shall be provided with an integrated operating station for command, navigation, manoeuvring and communication and so arranged that it can accommodate those persons required to navigate the craft safely.

Refer to resolution MSC.64(67) annex 1: Performance standards for integrated bridge systems (IBS), and resolution MSC.86(70) annex 3: Performance standards for integrated navigation systems (INS). (SOLAS Ch V Reg 15)

MSC.64(67) amends A.827(19) Annex 2 revised by MSC.114(73), refer to A.477(XII) for backup requirements (Annex 5).

15.4.4 The arrangement of equipment and means for navigation, manoeuvring, control, communication and other essential instruments shall be located sufficiently close together to enable both the officer in charge and any assisting officer to receive all necessary

information and to use the equipment and controls, as required, while they are seated. If necessary, the equipment and means serving these functions shall be duplicated.

15.4.5 If a separate workstation for supervision of engine performance is placed in the operating compartment, the location and use of this workstation shall not interfere with the primary functions to be performed in the operating station.

15.4.6 The location of the radio equipment shall not interfere with the primary navigational functions in the operating station.

15.4.7 The design and layout of the compartment from which the crew operate the craft and the relative positions of the primary controls shall be assessed against the essential operational manning level. Where minimum manning levels are proposed, the design and layout of the primary and communication controls shall form an integrated operational and emergency control centre from which the craft can be controlled under all operational and emergency events by the operating crew without the necessity for any crew member to vacate the compartment.

15.4.8 The relative positions of the primary controls and the seats shall be such that each operating crew member, with the seat suitably adjusted and without prejudicing compliance with 15.2, can:

- .1 without interference, produce full and unrestricted movement of each control both separately and with all practical combinations of movement of other controls; and
- .2 at all workstations, exert adequate control forces for the operation to be performed.

15.4.9 When a seat at a station from which the craft may be operated has been adjusted so as to suit the occupant, subsequent change of seat position to operate any control shall not be acceptable.

15.4.10 In craft where the Administration considers the provision of a safety belt necessary for use by the operating crew, it shall be possible for those operating crew members, with their safety belts correctly worn, to comply with 15.4.4 except in respect of controls which it can be shown will only be required on very rare occasions and which are not associated with the need for safety restraint.

15.4.11 The integrated operating station shall contain equipment which provides relevant information to enable the officer in charge and any assisting officer to carry out navigational and safety functions safely and efficiently.

15.4.12 Adequate arrangements shall be made to prevent passengers from distracting the attention of the operating crew.

15.5 Instruments and chart table

15.5.1 Instruments, instrument panels and controls shall be permanently mounted in consoles or other appropriate places, taking into account operation, maintenance and environmental conditions. However, this shall not prevent the use of new control or display techniques, provided the facilities offered are not inferior to recognized standards.

15.5.2 All instruments shall be logically grouped according to their functions. In order to reduce to a minimum the risk of confusion, instruments shall not be rationalized by sharing functions or by inter-switching.

15.5.3 Instruments required for use by any member of the operating crew shall be plainly visible and easily read:

- .1 with minimum practicable deviation from his normal seating position and line of vision; and
- .2 with the minimum risk of confusion under all likely operating conditions.

It should be noted that some visual display units (VDUs) and liquid crystal displays (LCDs) have a limited viewing sector within which the information can be clearly discerned. Visibility of such devices should therefore be checked when the displays are active.

15.5.4 Instruments essential for the safe operation of the craft shall be clearly marked with any limitation if this information is not otherwise clearly presented to the operating crew. The instrument panels forming the emergency control for the launching of liferafts and the monitoring of the fire-fighting systems shall be in separate and clearly defined positions within the operating area.

15.5.5 The instruments and controls shall be provided with means for screening and dimming in order to minimize glare and reflections and prevent them being obscured by strong light.

15.5.6 The surfaces of console tops and instruments shall have dark glare-free colours.

15.5.7 Instruments and displays providing visual information to more than one person shall be located for easy viewing by all users concurrently. If this is not possible, the instrument or display shall be duplicated.

It should be noted that some visual display units (VDUs) and liquid crystal displays (LCDs) have a limited viewing sector within which the information can be clearly discerned. Visibility of such devices should therefore be checked when the displays are active.

15.5.8 If considered necessary by the Administration, the operating compartment shall be provided with a suitable table for chart work. There shall be facilities for lighting the chart. Chart-table lighting shall be screened.

15.6 Lighting

15.6.1 A satisfactory level of lighting shall be available to enable the operating personnel to adequately perform all their tasks both at sea and in port, by day and night. There shall be only a limited reduction in the illumination of essential instruments and controls under likely system fault conditions.

15.6.2 Care shall be taken to avoid glare and stray image reflection in the operating area environment. High contrast in brightness between work area and surroundings shall be avoided. Non-reflective or matt surfaces shall be used to reduce indirect glare to a minimum.

15.6.3 A satisfactory degree of flexibility within the lighting system shall be available to enable the operating personnel to adjust the lighting intensity and direction as required in the different areas of the operating compartment and at individual instruments and controls.

15.6.4 Red light shall be used to maintain dark adaptation whenever possible in areas or on items of equipment requiring illumination in the operational mode, other than the chart table.

15.6.5 During hours of darkness, it shall be possible to discern displayed information and control devices.

15.6.6 Reference is made to additional requirements on lighting in 12.7 and 12.8.

15.7 Windows

15.7.1 Divisions between windows, located in the front, on the sides and in the doors, shall be kept to a minimum. No division shall be installed immediately forward of the operating stations.

15.7.2 Administrations shall be satisfied that a clear view through the operating compartment windows is provided at all times regardless of weather conditions. The means provided for maintaining the windows in a clear condition shall be so arranged that no reasonably probable single failure can result in a reduction of the cleared field of vision such as to interfere seriously with the ability of the operating crew to continue the operation and bring the craft to rest.

15.7.3 Arrangements shall be provided so that the forward view from operating stations is not adversely affected by solar glare. Neither polarized nor tinted window glass shall be fitted.

15.7.4 Operating compartment windows shall be angled to reduce unwanted reflection.

15.7.5 The windows shall be made of material which will not break into dangerous fragments if fractured.

15.8 Communication facilities

15.8.1 Such means as are necessary shall be provided to enable the crew to communicate between, and have access to, each other and with other occupants of the craft in both normal and emergency conditions.

15.8.2 Means to communicate between the operating compartment and spaces containing essential machinery, including any emergency steering position, irrespective of whether the machinery is remotely or locally controlled, shall be provided.

15.8.3 Means for making public address and safety announcements from control stations to all areas to which passengers and crew have access shall be provided.

15.8.4 Provisions shall be made for means to monitor, receive and transmit radio safety messages at the operating compartment.

15.9 Temperature and ventilation

The operating compartment shall be equipped with adequate temperature and ventilation control systems.

15.10 Colours

The surface materials inside the operating compartment shall have a suitable colour and finish to avoid reflections.

15.11 Safety measures

The operating area shall be free of physical hazard to the operating personnel and have non-skid flooring in dry and wet conditions and adequate handrails. Doors shall be fitted with devices to prevent them moving, whether they are open or closed.