



RULES
PUBLICATION 35/P

ONE MAN BRIDGE OPERATED (OMBO) SHIPS

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complete or extend the Rules and are mandatory where applicable.

GDAŃSK

Publication No.35/P – One Man Bridge Operated (OMBO) Ships– January 2022 is an extension of the requirements contained in *Part VIII – Electrical Installations and Control Systems* of the *Rules for the Classification and Construction of Sea-going Ships*.

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Publication No.35/P is applicable also to other PRS *Rules*, if referred to therein.

The present *Publication* replaces *Publication No.35/P – One Man Bridge Operated (OMBO) Ships – February 2017*.

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1 GENERAL

1.1 Basis of the Requirements

The present requirements are based on the understanding that the ship radio and navigational equipment complies with the applicable regulations and guidelines issued by the International Maritime Organization (hereinafter referred to as IMO) and, in particular:

1.1.1 Conventions:

- Regulation 19, Chapter V of the *International Convention for the Safety of Life at Sea, 1974* (hereinafter referred to as the *SOLAS Convention*) and all other relevant regulations relating to radio communication and safety of navigation, specified in Chapters IV and V of the *SOLAS Convention*, as amended,
- the *International Regulations for Preventing Collisions at Sea (COLREG - 1972)*, as amended.

1.1.2 The performance standards for ¹:

- magnetic compasses,
- gyro-compasses,
- radars,
- automatic radar plotting aid (ARPA),
- speed and distance measuring equipment,
- echo sounding equipment,
- automatic identification systems (AIS),
- global positioning system (GPS) and global navigation satellite system (GLONASS) universal receivers,
- electronic chart display and information system (ECDIS),
- navigational and meteorological warnings and forecasts (NAVTEX) receivers,
- electronic navigational aids – general requirements,
- VHF DSC radio installation,
- automatic pilots,
- rate-of-turn indicators.

1.2 Scope of Application

1.2.1 The present *Publication* is applicable to sea-going ships classed with PRS which, upon compliance with the requirements set forth in the *Publication*, may be assigned the additional mark **NAV1**, affixed to the symbol of class.

This mark means that the ship is allowed to operate with one man watch on the bridge, in normal conditions.

1.2.2 The present requirements are applicable to new ships and to ships in service.

1.3 Definitions

Acquisition – the selection of target ships requiring a tracking procedure and the initiation of their tracking

AIS – automatic identification system.

Alarm – a visual and audible signal indicating an abnormal situation.

¹ The requirements for particular equipment are given in Chapters IV and V of the *SOLAS Convention*, as amended.

ARPA – automatic radar plotting aid.

Back-up officer – any officer who has been designated by the ship master to be on call if assistance is needed on the navigation bridge.

BNWAS – bridge navigational watch alarm system.

Bridge – that area from which the navigation and control of the ship is exercised, including the wheelhouse and bridge wings.

Bridge wings – those parts of the bridge on both sides of the ship's wheelhouse which, in general, extend to the ship's side.

CPA – closest point of approach, i.e. the shortest target ship – own ship calculated distance that will occur in case of no change in course and speed data.

Display – means by which a device presents visual information to the officer of the watch.

ECDIS – electronic chart display and information system.

GPS – global positioning system.

Navigation – all tasks relevant for deciding, executing and maintaining course and speed in relation to waters and traffic, enabling a safe conducting of ship from one place to another.

NAVTEX receiver – a receiver capable of receiving navigational and meteorological warnings and forecasts broadcast by the International NAVTEX Service.

Normal conditions – when all systems and equipment related to navigation operate within design limits and environmental conditions, such as weather and traffic do not cause excessive workload to the officer of the watch.

Officer of the watch – person responsible for safe navigating, operating of bridge equipment and manoeuvring of the ship.

Radar plotting – the whole process of target detection, tracking, calculation of parameters and display of information.

TCPA – time to closest point of approach.

Tracking – the process of observing the sequential changes in the position of a target, to establish its motion.

Watch alarm – alarm that is transferred from the bridge to the master and the back-up officer in case of any officer of the watch deficiency (absence, lack of alertness, no response to another alarm/warning, etc.).

Wheelhouse – enclosed area of the bridge.

2 BRIDGE LAYOUT

2.1 The bridge configuration, the arrangement of consoles and equipment location shall enable the officer of the watch to perform navigational duties and other functions allocated to the bridge, as well as to maintain a proper lookout from a convenient position on the bridge, hereinafter referred to as a workstation.

2.2 A workstation for navigation and traffic surveillance/manoeuvring shall be arranged to enable efficient operation by one person under normal operating conditions. All relevant instrumentation and controls shall be easily visible, audible and accessible from the workstation.

2.3 For the purpose of performing duties related to navigation, traffic surveillance and manoeuvring, the field of vision from a workstation shall be such as to enable observation of all objects which may affect the safe conning of the ship.

The field of vision from a workstation shall be in accordance with the guidelines on navigation bridge visibility, as specified in the *SOLAS Convention*, Chapter V, regulation 22, as amended.

For other functions, other workstations may be arranged singularly or in combination, provided the field of vision complies with the foregoing.

2.4 The bridge layout design and workstations shall enable the ship to be navigated and maneuvered safely by two officers of the watch in cooperation.

2.5 External sound signals from ships and fog signals that are audible on the open deck shall also be audible inside the wheelhouse; a transmitting device shall be provided to reproduce such signals inside the wheelhouse (recommended frequency range: 70 to 700 Hz).

2.6 The requirements and guidelines of ISO 8468:2007 (reviewed every 5 years) shall be regarded as a basic reference for the design of bridge layout.

3 BRIDGE INSTRUMENTATION AND CONTROLS

The instrumentation and controls at the workstation for navigation and traffic surveillance/ manoeuvring shall be arranged to enable the officer of the watch to:

- determine and plot the ship's position, course, track and speed,
- analyze the traffic situation in order to avoid collision,
- decide on collision avoidance maneuvers,
- alter course,
- change speed,
- effect internal and external communications related to navigation and manoeuvring, VHF DSC radio communication,
- give sound signals,
- hear sound signals,
- monitor course, speed, track, propeller revolution (pitch), rudder angle and depth of water,
- record navigational data (may be manually recorded from data available at the workstation).

4 EQUIPMENT TO BE FITTED

Irrespective of its size, gross tonnage and date of construction, every ship assigned the additional mark **NAV1**, affixed to the symbol of class, shall be equipped with the instrumentation and controls specified in Chapters 5 to 7.

5 SAFETY OF NAVIGATION: COLLISION-GROUNDING

5.1 The ship shall be equipped with an ARPA system including, or associated with, a collision avoidance system, meeting the requirements of IMO Resolution A.823 (19). The ARPA function may be independent or built into the radar equipment.

The system shall be based on the assumption that all floating objects may come onto a collision course with own ship if the object's course is changed up to 45° with its speed maintained. A warning shall be given to the officer of the watch at a time which shall be adjustable in the range of 6 to 30 minutes, having regard to the time to danger (TCPA).

5.2 The whole equipment shall feature the following capability:

- .1 true motion and relative motion modes,
- .2 daylight-visible display,
- .3 automatic acquisition and tracking of at least 20 radar targets,
- .4 guard zone system, featuring adjustable parameters, notably warning and alarm set for CPA and TCPA,
- .5 simulator function showing the likely effects of a course or speed change in relation to tracked targets,
- .6 incorporated self-checking properties.

5.3 An automatic pilot shall be provided and monitored by an off-course alarm addressed to the officer of the watch, in case of malfunction.

This alarm shall be derived from a system independent from the automatic steering system.

An overriding control device shall be provided at the navigating and manoeuvring workstation. Alternatively, track piloting equipment may be permitted.

5.4 The officer of the watch shall be given an alarm in case of deviation from the planned route. This alarm shall be adjustable having regard to the time to danger of grounding.

5.5 Pre-warning shall be given at the approach of a way-point.

5.6 An alarm shall be initiated when the water depth beneath the ship is less than a predetermined value.

6 POSITION FIXING

6.1 Ships shall be provided with the position fixing systems appropriate to the intended service areas.

6.2 At least 2 independent radars shall be provided. One of them shall operate within the X-band.

6.3 A gyro-compass system shall be provided.

6.4 An echo sounding system shall be provided.

6.5 A speed log system shall be provided.

7 CONTROLS – COMMUNICATION

On the bridge, the following arrangements shall be provided:

- .1 a propulsion plant remote control system;
- .2 a whistle control device;
- .3 a window wipe and wash control device;
- .4 a main workstation console lighting control device;
- .5 steering pump selector/control switches;
- .6 an internal communication system;
- .7 a VHF DSC radio installation;
- .8 a wheelhouse heating/cooling control device;
- .9 a NAVTEX automatic receiver and recorder.

Equipment and controls listed in .1 to .7 shall be fitted within the reach of the officer of the watch when seated or standing at the main navigating and manoeuvring workstation.

8 PREVENTION OF ACCIDENTS CAUSED BY OPERATOR'S UNFITNESS

8.1 Bridge Navigational Watch Alarm System

8.1.1 General Requirements

8.1.1.1 A navigational watch alarm system (hereinafter referred to as BNWAS) shall be provided to indicate that an alert officer of the watch is present on the bridge.

8.1.1.2 The purpose of the BNWAS is to monitor bridge activity and detect operator disability which could lead to marine accidents. The system monitors the awareness of the officer of the watch and automatically alerts the ship's master or another qualified officer if for any reason the officer of the watch becomes incapable of performing the officer of the watch duties. The purpose is achieved by a series of indications and alarms to alert first the officer of the watch and, if he is not responding, to alert the ships' master or another qualified officer.

8.1.1.3 Additionally, the BNWAS may provide the officer of the watch with a means of calling for immediate assistance, if required. The BNWAS shall be operational whenever the ship's heading or track control system is engaged, unless inhibited by the ship's master.

8.1.2 Operational Modes

8.1.2.1 The BNWAS shall incorporate three operational modes:

- AUTOMATIC² (AUTOMATICALLY BROUGHT INTO ACTION WHENEVER THE SHIP'S HEADING OR TRACK CONTROL SYSTEM IS ACTIVATED AND INHIBITED WHEN THIS SYSTEM IS NOT ACTIVATED),
- MANUAL ON – IN OPERATION CONSTANTLY,
- MANUAL OFF – DOES NOT OPERATE UNDER ANY CIRCUMSTANCES.

8.1.3 Operational Sequence of Indications and Alarms

8.1.3.1 Once operational, the BNWAS shall remain dormant for a period of between 3 and 12 min (Td).

8.1.3.2 At the end of this dormant period, the BNWAS shall initiate a visual indication on the bridge.

8.1.3.3 If not reset, the BNWAS shall additionally sound a first stage audible alarm on the bridge 15 s after the visual indication is initiated.

8.1.3.4 If not reset, the BNWAS shall additionally sound a second stage remote audible alarm in the back-up officer's and/or the master's location 15 s after the first stage audible alarm is initiated.

² The Automatic mode is not suitable for use on a ship conforming with regulation SOLAS V/19.2.2.3 which requires the BNWAS to be in operation whenever the ship is underway at sea – See: MSC.1/Circ.1474.

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

8.1.3.6 In ships other than passenger ships, the second or third stage remote audible alarms may sound in all above locations at the same time. If the second stage audible alarm is used in this way, the third stage alarm may be omitted.

8.1.3.7 In large ships, the delay between the second and third stage alarms may be increased, up to a maximum of 3 min, to allow sufficient time for a back-up officer and/or master to reach the bridge.

8.1.4 Reset (Alarm cancellation)

8.1.4.1 It shall not be possible to initiate the reset function or cancel any audible alarm from any device, equipment or system not physically located in areas of the bridge providing proper look out.

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

8.1.4.3 To initiate the reset function, an input representing a single operator action by the officer of the watch is required. This input may be generated by reset devices forming an integral part of the BNWAS or by external inputs from other equipment capable of registering physical activity and mental awareness of the officer of the watch.

8.1.4.4 A continuous activation of any reset device shall not prolong the dormant period or cause a suppression of the sequence of indications and alarms.

8.1.5 Means may be provided on the bridge to immediately activate the second, and subsequently third stage remote audible alarms by means of an "Emergency Call" push button or similar.

8.1.6 Accuracy

The BNWAS shall be capable of achieving the timings, specified in sub-chapter 8.1.3, with an accuracy of 5% or 5 s, whichever is the lesser, under all environmental conditions.

8.1.7 Security

The means of selecting the operational mode and the duration of the dormant period shall be security protected so that access to these controls should be restricted to the ship's master only.

8.1.8 Malfunction

8.1.8.1 Malfunction of, or power supply failure to, the BNWAS, shall be indicated. Means shall be provided to allow the repeat of this indication on a central alarm panel, if fitted.

8.1.9 Operational Controls

8.1.9.1 A suitably protected means of selecting the operational mode of the BNWAS shall be provided.

8.1.9.2 A suitably protected means of selecting the duration of the dormant period of the BNWAS shall be provided.

8.1.9.3 A means of activating the „Emergency Call” function if this facility is incorporated in the BNWAS, shall be provided.

8.1.9.4 Means of activating the reset function shall only be available in positions on the bridge giving proper look out and preferably adjacent to visual indications. Means of activating the reset function shall be easily accessible from the conning position, the workstation for navigating and manoeuvring, the workstation for monitoring and the bridge wings.

8.1.10 Presentation of Information

8.1.10.1 The operational mode of the equipment shall be indicated to the officer of the watch.

8.1.10.2 The visual indication initiated at the end of the dormant period shall take the form of a flashing indication. The flashing indication shall be visible from all operational positions on the bridge where the officer of the watch may reasonably be expected to be stationed. The colour of the indication shall be chosen so as not to impair night vision and dimming facilities (although not to extinction) shall be incorporated.

8.1.10.3 The first stage audible alarm which sounds on the bridge at the end of the visual indication period shall have its own characteristic tone or modulation intended to alert, but not startle, the officer of the watch. This alarm shall be audible from all operational positions on the bridge where the officer of the watch may reasonably be expected to be stationed. This function may be engineered using one or more sound devices. Tone/modulation characteristics and volume level shall be selectable during commissioning of the system.

8.1.10.4 The second and third stage remote audible alarm which sounds in the locations of the ship’s master, officers and further crew members capable of taking corrective action at the end of the bridge audible alarm period shall be easily identifiable by its sound and shall indicate urgency. The volume of this alarm shall be sufficient for it to be heard throughout the locations above and to wake sleeping persons (see Resolution A.1021 (26)).

8.1.11 Design and Installation

8.1.11.1 The BNWAS equipment shall comply with IMO *Resolutions A.694(17)* and *A.813(19)*, the associated international standards (*Publication IEC 60945*) and *MSC/Circ.982 – Guidelines for Ergonomic Criteria for Bridge Equipment and Layout*.

8.1.11.2 All items of equipment forming part of the BNWAS shall be secured against access by unauthorized persons.

8.1.11.3 Reset devices shall be designed and installed so as to minimize the possibility of their operation by any means other than activation by the officer of the watch. Reset devices shall all be of a uniform design and shall be illuminated for identification at night.

8.1.11.4 Alternative reset arrangements may be incorporated to initiate the reset function from other equipment on the bridge capable of registering operator actions in positions giving proper look out.

8.1.12 Power Supply

8.1.12.1 The BNWAS shall be supplied from the ship's main source of electrical power. The malfunction indication and all elements of the "Emergency Call" facility, if incorporated, shall be powered from a battery maintained supply.

8.1.13 Interfacing

8.1.13.1 Inputs shall be available for additional reset devices or for connection to bridge equipment capable of generating a reset signal by contacts, equivalent circuits or serial data, in accordance with *Publication IEC 61162*.

8.1.13.2 Outputs shall be available for connection of additional bridge visual indications and audible alarms and remote audible alarms.

8.1.13.3 The system shall provide for the acknowledgement by the officer of the watch at the navigating and traffic surveillance/manoeuvring workstation and other appropriate locations in the bridge from where a proper lookout may be kept.

8.1.13.4 The BNWAS shall be connected to the alarm transfer system described in sub-chapter 8.2.

8.1.13.5 An alarm shall operate on the bridge in the event of the BNWAS failure.

8.1.14 Alternative Arrangements

8.1.14.1 The requirements of sub-chapter 8.1 do not prevent PRS from accepting any technical systems that adequately verify or help to maintain the alertness of the officer of the watch at intervals up to 12 minutes.

8.2 Alarm/warning Transfer System – Communications

8.2.1 Any alarm/warning that requires the officer of the watch response shall be automatically transferred to the master and, if he deems it necessary, to the selected back-up officer and to the public rooms, if not acknowledged on the bridge within 30 seconds.

Such transfer shall be carried out through the systems required by 8.2.3 to 8.2.7, where applicable.

8.2.2 Acknowledgement of alarms/warnings shall only be possible from the bridge.

8.2.3 The alarm/warning transfer shall be operated through a fixed installation.

8.2.4 Provision shall be made on the bridge for the operation of an officer of the watch call-alarm to be clearly audible in the spaces specified in para. 8.2.1.

8.2.5 The alarm transfer system shall be continuously powered and shall have an automatic changeover to a standby power supply in case of loss of normal power supply.

8.2.6 At all times, including during black-out, the officer of the watch shall have access to facilities enabling two way speech communication with back-up officer.

The bridge shall have priority over the communication system.

Note: The automatic telephone network is acceptable for this purpose, provided that it is automatically supplied during black-out situation and that it is available in the locations specified in para. 8.2.1.

8.2.7 If, depending on the shipboard work organization, the back-up officer may attend locations not connected to the fixed installation(s), described in para.8.2.1, he shall be provided with a wireless portable device enabling both the alarm/warning transfer and the two way speech communication with the officer of the watch.

9 NAVIGATIONAL EQUIPMENT DESIGN AND RELIABILITY

9.1 Environmental Conditions

9.1.1 Shipborne navigational equipment shall be capable of continuous operation under the conditions of various sea states, vibration, humidity, temperature and electromagnetic interferences, likely to be experienced in the ship in which it is installed.

9.1.2 Equipment which has been additionally specified in the present *Publication* shall comply with the environmental conditions stated in *Publication IEC 60945*.

9.2 Power Supply

9.2.1 Local distribution panels shall be arranged for all items of electrically operated navigational equipment. These panels shall be supplied by two exclusive circuits, one fed from the main source of electrical power and one fed from an emergency source of electrical power.

Each item of navigational equipment shall be individually connected to its distribution panel. The power supplies to the distribution panels shall be arranged with automatic changeover facilities between the two sources.

Failure of the main power supply to the distribution panels shall initiate an audible and visual alarm.

9.2.2 Following a loss of power which has lasted for 30 seconds or less, all primary functions shall be readily reinstated.

Following a loss of power which has lasted for more than 30 seconds, as many as practical primary functions shall be readily reinstated.

9.2.3 Where computerized equipment is interconnected through a computer network, failure of the network shall not prevent individual equipment from performing its individual functions.

9.3 Ergonomical Recommendations

The human factor shall be taken into account in the analysis and design of equipment, as well as the layout of the bridge, work and working environment; the environmental conditions, given below, shall be complied with.

9.3.1 The lighting required on the bridge shall be designed so as not to impair the night vision of the officer of the watch. Lighting used in areas and at items of equipment requiring illumination whilst the ship is navigating shall be such that night vision adaptation is not impaired, e.g. red lighting. Such lighting shall be arranged so that it cannot be mistaken for a navigation light by another ship.

It is to be noted that lighting fitted over chart tables shall be such as not to cause possible confusion in colour discrimination.

9.3.2 The noise level on the bridge should not interfere with verbal communication, mask audible alarms or be uncomfortable to the bridge personnel.

9.3.3 The vibration level on the bridge should not be uncomfortable to the bridge personnel.

9.3.4 Unless justified, wheelhouse spaces shall be provided with heating and air cooling systems. System controls shall be readily available to the officer of the watch.

9.3.5 There shall be no sharp edges or protuberances on surfaces of the instruments and equipment installed on the bridge which could cause injury to the officer of the watch.

Sufficient hand-rails or equivalent thereto shall be fitted inside the wheelhouse or around instruments and equipment in the wheelhouse for safety in bad weather.

Where provision for seating is made in the wheelhouse, means for securing shall be provided, having regard to storm conditions.

Adequate means shall be made for anti-slip of the floor, whether it be dry or wet condition.

Doors to the bridge wings shall be easy to open and close. Means shall be provided to hold the doors open at any position.

10 TESTS AND SURVEYS

10.1 Testing of the Equipment after Installation Onboard

10.1.1 After fitting onboard, the installations shall be submitted to the tests deemed necessary to demonstrate correct operation. Some tests may be carried at the quayside, while others shall be effected at sea trials.

10.1.2 On-board tests and sea trials shall be carried out in accordance with the test procedures submitted in advance to PRS for approval. Tests and trials shall be performed under the supervision of the PRS Surveyor.

10.2 Surveys

10.2.1 The equipment specified in the present *Publication* shall be subjected to periodical surveys.

10.2.2 Types of periodical surveys and the survey procedures are specified in *Part I – Classification Regulations of the Rules for the Classification and Construction of Sea-going Ships* and *Part I – Survey Regulations of the Rules for Statutory Survey of Sea-going Ships*.

List of amendments effective as of 1 January 2022

<i>Item</i>	<i>Title/Subject</i>	<i>Source</i>
2.6	Updated ISO Standard	ISO.org