# R U L E S
## FOR CLASSIFICATION AND CONSTRUCTION OF FLOATING DOCKS

PART V
## MACHINERY INSTALLATIONS

October
2021

GDAŃSK

**RULES FOR CLASSIFICATION AND CONSTRUCTION OF FLOATING DOCKS** developed and edited by Polski Rejestr Statków S.A., hereinafter referred to as PRS, consist of the following parts:

Part I – Classification Regulations
Part II – Hull and Hull Equipment
Part III – Stability and Freeboard
Part IV – Fire Protection
Part V – Machinery Installations
Part VI – Electrical Equipment
Part VII – Lifting Appliances

in respect of materials and welding, the requirements specified in the *Rules for Classification and Construction of Sea-going Ships, Part IX – Materials and Welding* apply.

*Part V – Machinery Installations – October 2021* was approved by the Executive Board of PRS S.A. on 28 October 2021 and enters into force on 29 October 2021.

Since the entry into force, the requirements of *Part V* have been applicable to floating docks in accordance with the provisions of *Part I – Classification Regulations*.



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CONTENTS

## 1 GENERAL

**1.1** The documentation concerning machinery installations, machinery, equipment, machinery spaces and piplines the dock is fitted with shall comply with the requirements of the *Rules for Classification and Construction of Sea-going Ships* in the scope necessary for the dock equipment.

**1.2** In addition to the requirements mentioned in paragraph 1.1, the following additional requirements for the dock machinery installations shall be fulfilled.

**1.3** These provisions do not apply to the installations on board the ship(s) being docked.

**1.4** The floating dock shall have effective means for ballasting and de-ballasting of tanks to ensure a safe operation of the dock and the ship(s) being docked.

**1.5** Effective means shall be arranged for operation of pumps and valves and for remote level gauging of ballast tanks from a central control station with visual contact to the ship(s) being docked.

## 2 PUMPS

**2.1** Ballast system shall be so arranged that each tank can be ballasted by at least two pumps or gravitational flow through remotely controlled valves. De-ballasting system shall be so arranged that each tank can be de-ballasted by at least two pumps. The ballast pumps shall be fitted with self-priming units of sufficient capacity.

**2.2** The capacity of each pump mentioned in paragraph 3.4 shall be sufficient to ensure regular flow velocity through the main bilge line not less than 2 m/s (for bilge line diameters – see paragraphs 3.1 and 3.2).

**2.3** For the removal of residual ballast water after the ballast water discharge, it is recommended that a stripping pump should be installed.

**2.4** The ballast pumps shall be securely mounted on its structural foundations and arranged so to permit unrestricted water flow to the pump suction. Systems providing by-passes around pump and non-return valves to permit fast flooding of ballast tanks are subject to special consideration by PRS.

## 3 PIPING

**3.1** The internal diameter of branch suction pipes from any compartment or tank shall not be less than the value obtained in accordance with the following formula:

$$d = 2{,}15\sqrt{P} + 25\ ,\ \text{mm} \qquad 3.1$$

$P$ – area in m$^2$ of the compartment or tank which is below the level corresponding to maximum draught of the dock with minimum freeboard to upper deck,

Diameter $d$ shall not in any case be less than 50 mm.

**3.2** The sectional flow area of the main bilge line shall not be less than the combined area of the two largest branch suctions.

**3.3** Bilge drainage system shall in each case be separated from the ballast system and shall be served by at least two drainage pumps situated as close to the bottom as possible. Each of those pumps shall be capable of suction from each compartment being drained.

**3.4** The dock shall have bilge drainage system for dry compartments. The arrangement shall be such that water cannot unintentionally enter dry compartments or pass from one compartment to another.

**3.5** Ballast system shall be so arranged to preclude spontaneous and uncontrolled water flow between the ballast tanks.

**3.6** Dock piping systems supplied from the shore which are subject to shore survey by the governmental body shall be surveyed by the same governmental survey body

**3.7** Inlet openings in the outer shell shall be provided with grids or protective mesh guards. Mesh aperture width shall not exceed 20 mm.

## 4 VALVES

**4.1** Bottom and side fittings shall be made of steel or cast steel or nodular cast iron having properties as required in sub-chapter 15.1 in *Part IX – Materials and Welding* of the *Rules for Classification and Construction of Sea-going Ships* and shall have PRS Test Certificates.

**4.2** The ballast systems susceptible to sudden changes in fluid flow velocities ("water hammer") shall be safely protected against this phenomenon. The non-slam check valves shall be used on discharge side of the ballast pump(s) to prevent sudden stopping of reverse flow through the check valve as it closes. The ballast pipes shall be sufficiently fixed on its supports in order to be capable of withstanding a surge force. Valve's actuators shall be designed to achieve the safe valve's closure time to avoid the risk of "water hammer".

**Note:** Water hammer or pressure surge is the sudden rise or fall in pressure caused by abrupt change in the fluid velocity within the pipe system.

**4.3** Remotely-controlled valves shall be capable of being manually controlled from a position as close as possible and permanently accessible. Sea-chest inlet valves and discharge outboard valves and dock ballast distribution valves shall also be capable of being controlled from the position on the upper deck enabling good visibility of the ship(s) being docked and the control of the pumps' operation and the valve position indicators. For remote control interlock – see sub-chapter 5.2 in Part VI – *Electrical Equipment*.

**4.4** Lower edge of outboard discharge valves, except those for ballast and boiler blow-off, shall be situated at least 300 mm above the maximum water line of pontoon in the steady working state at the maximum deadweight. Such openings shall be provided with non-return shut-off valves. Each ballast overboard discharge line is to have a positive-closing overboard discharge valve adjacent to the shell of the floating dock and operable from above the upper deck. In addition, a non-return valve shall be installed inboard of the overboard discharge valve.

**4.5** Where a dock installation pipeline is connected to a shore installation, such a connection shall be capable of being cut-off by a non-return shut-off valve located on the wing tower in a readily accessible position above the freeboard waterline.

**4.6** For the intake of water for machinery cooling, two sea-chest valves shall be provided and one of them shall ensure continuous intake of clean not silted water, between the minimum and maximum dock's draught.

**4.7** Suction ends in ballast tanks shall be fitted with bell mouths. It is recommended that the bell mouths be located in the tank centre.

**4.8** The bottom sea chests gratings shall be provided with arrangements for their blow-off with compressed air or – in freezing waters – with steam at the pressure not exceeding 0.5 MPa.

**4.9** It is recommended that full closure or opening time of the main and distribution gate valves be available within 30 seconds. It is also recommended that continuous remote control of the opening extent of gate valves in intermediate positions be available. Gate valves' drive – see also sub-chapter 5.4 in Part VI – *Electrical Equipment*.

## 5 VENTING OF BALLAST TANKS

**5.1** Each ballast tank shall be provided with two venting pipes located at each end of the tank.

**5.2** Cross-section area of each venting pipe shall be at least 1.0 of the filling line cross-section area for gravitational filling, and 1.25 for filling by ballast pumps.

**5.3** It is recommended that outlets of pipes venting the central dock's ballast tanks be led under the upper deck on the outer wall. The safe height of the outlets under the upper deck shall be at least 400 mm measured from the max. draught waterline (see 3.3.1, *Part III –Stability and Freeboard*).

**5.4** In the case of ballast tanks not to filled in 100% at the dock draught to the minimum freeboard, the outlets of vent pipes shall be led above the upper deck (see paragraph 3.3.2, *Part III –Stability and Freeboard*).

**5.5** The maximum draught of the dock may be controlled by fitting air pipes under the safety deck and/or centre pontoons tanks to prevent over sinking of the dock. The length of these pipes will be dependent on the height of the air cushion desired.

Vent pipes penetration depth shall correspond to the calculated design height of air cushion.

The depth of the air pipe below the safety deck is set during the deep sink trials. The air pipes shall be of substantial thickness and rigidly supported at their lower ends (see table 1.16.3.1-1, column C, *Part VI – Machinery installations and refrigerating plants* of the *Rules for the Classification and Construction of Sea-going Ships*).

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**List of amendments effective of 29 October 2021**

| *Item* | *Title/Subject* | *Source* |
|---|---|---|
| 1.4, 1.5, 2.1, 2.4, 3.1, 3.2, 3.4, 4.2, 4.3,4.4, 5.1, 5.5 | Operational safety of the floating dock | PRS survey experience / Dock 24000 DWT for SSW |
| 2.2, 2.3, 3.3, 3.5 ,4.1 ,4.5 4.8, 4.9, 5.2, 5.3, 5.4 | Editorial corrections | – |

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