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[^{F1}ANNEX I

SAFETY REQUIREMENTS FOR NEW AND EXISTING PASSENGER SHIPS ENGAGED ON DOMESTIC VOYAGES

Textual Amendments

- F1** Substituted by [Commission Directive 2010/36/EU of 1 June 2010 amending Directive 2009/45/EC of the European Parliament and of the Council on safety rules and standards for passenger ships \(Text with EEA relevance\)](#).

CHAPTER II-1

CONSTRUCTION — SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART C

MACHINERY

6 Steering gear (R 29)

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

- .1 Every ship shall be provided with an efficient main and auxiliary steering system. The main steering system and the auxiliary steering system shall be so arranged that the failure of one of them will not render the other one inoperative.
- .2 The main steering gear and rudder stock where fitted shall be:
 - .2.1 of adequate strength, and capable to steer the ship at maximum service speed ahead, and so designed that they will not be damaged at maximum speed astern;
 - .2.2 [^{F2}capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions from 35° on either side to 30° on the other side in not more than 28 seconds. Where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch, ships, regardless of their date of construction, may demonstrate compliance with this requirement by one of the following methods:
 - .1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch; or
 - .2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at the speed corresponding to

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- the number of maximum continuous revolutions of the main engine and maximum design pitch; or
- .3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. The speed of the ship shall correspond to the number of maximum continuous revolutions of the main engine and maximum design pitch of the propeller;]
- .2.3 operated by power where necessary to meet the requirements of paragraph .2.2.2 and in any case when a rudder stock over 120 mm in diameter in way of the tiller, excluding strengthening for navigation in ice, is required in order to comply with paragraph .2.2.1.

Textual Amendments

- F2** Substituted by [Commission Directive \(EU\) 2016/844 of 27 May 2016 amending Directive 2009/45/EC of the European Parliament and of the Council on safety rules and standards for passenger ships \(Text with EEA relevance\)](#).

- .3 If fitted, the auxiliary steering gear shall be:
 - .1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
 - .2 [^{F2}capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater. Where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater, ships regardless of their date of construction may demonstrate compliance with this requirement by one of the following methods:
 - .1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or
 - .2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the auxiliary steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or
 - .3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition;]
 - .3 operated by power where necessary to meet the requirements of paragraph .3.2 and in any case where a rudder stock is more than 230 mm in diameter in way of the tiller, excluding strengthening for navigation in ice.

NEW CLASS B, C AND D SHIPS:

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.4 Steering power units shall be:

- .1 arranged to restart automatically when power is restored after a power failure; and
- .2 capable of being brought into operation from a position on the navigating bridge. In the event of a power failure to any of the steering power units, an audible and visual alarm shall be given on the navigating bridge.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

- .5 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:
 - .1 the main steering gear is capable of operating the rudder as required by paragraph .2.2.2 while any one of the power unit is out of operation;
 - .2 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that the steering capability can be maintained or speedily regained.

NEW CLASS B, C AND D SHIPS:

.6 Steering gear control shall be provided:

- .1 for the main steering gear, both on the navigating bridge and in the steering compartment;
- .2 when the main steering gear is arranged in accordance with paragraph .4, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the steering wheel or steering lever. Where the control system consists of a hydraulic telemotor, a second independent system need not be fitted;
- .3 for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear.
- .7 Any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:
 - .1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;
 - .2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;
 - .3 the system shall be capable of being brought into operation from a position on the navigating bridge;
 - .4 in the event of a failure in the electrical power supply to the control system, an audible and visual alarm shall be given in the navigating bridge; and
 - .5 short circuit protection only shall be provided for steering gear control supply circuits.
- .8 The electrical power circuits and the steering gear control systems with their associated components, cables and pipes required by this Regulation and by Regulation 7 shall be separated as far as is practicable throughout their length.

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- .9 A means of communication shall be provided between the navigating bridge and the steering gear compartment or alternative steering position.
- .10 The angular position of the rudder(s) shall:
- .1 if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;
- .2 be recognisable in the steering gear compartment.
- .11 Hydraulic power-operated steering gear shall be provided with the following:
- .1 arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;
- .2 a low-level alarm for each hydraulic fluid reservoir to give the earliest practical indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigating bridge and in the machinery space where they can be readily observed; and
- .3 a fixed storage tank having sufficient capacity to recharge at least one power actuating system including the reservoir, where the main steering gear is required to be power-operated. The storage tank shall be permanently connected by piping in such manner that the hydraulic systems can be readily recharged from a position within the steering gear compartment and shall be provided with a contents gauge.
- .12 The steering gear compartments shall be:
- .1 readily accessible and, as far as practicable, separated from machinery spaces; and
- .2 provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other nonslip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.]