SLOVENSKI STANDARD
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Inland navigation vessels - Wheelhouse and control position - Types, safety requirements

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Fahrzeuge der Binnenschiffahrt - Steuerhaus und Steuerstand - Bauarten, sicherheitstechnische Anforderungen

Bateaux de navigation intérieure - Timonerie et poste de manoeuvre - Types, prescriptions de sécurité

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Inland navigation vessels - Wheelhouse and control position - Types, safety requirements

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 15 "Inland navigation vessels", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 1997, and conflicting national standards shall be withdrawn at the latest by September 1997.

The requirements for the "Control position" relate to the EU Directives, see Annex ZA.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

In order to steer the ship safely, important information about the ship and its environment should be clearly available.

1 Scope

This European Standard specifies safety and ergonomic requirements for wheelhouses and control positions on inland navigation vessels.

This standard does not apply to craft which is subject to EU directive for pleasure craft. Likewise ist does not apply to vessels below 20 m length unless they are passenger vessels, tugs or push boats.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the last edition of the publication referred to applies.

EN 790
Inland navigation vessels – Stairs with inclination angles of 45° to 60°

EN 60529
Degrees of protection provided by enclosures (IP code)

IEC 92-101
Electrical installations in ships – Part 101: Definitions and general requirements

ISO 2923 [1])
Acoustics – Measurement of noise on board vessels

ISO 3904
Shipbuilding and marine structures – Clear view screens

3 Definitions

For the purposes of this European Standard, the following definitions apply:

3.1 wheelhouse: Area accomodating the control position.

3.2 control position: Location from which all control, communication and supervisory functions are carried out for navigating the ship.

3.3 one-man control position with radar assistance: Control position with radar screen from which all the control, communication and supervisory functions for navigation are carried out by one person while seated in one location.

3.4 wing control position (Side control position): Control position at the side of the ship from which the control function of the ship can be taken over for certain manoeuvres.

3.5 unrestricted field of view: The sums of fields of view not covered or restricted by posts or installations.

4 Wheelhouse requirements

4.1 General requirements

4.1.1 The wheelhouse shall accomodate the control position with all devices needed for navigation.

4.1.2 The wheelhouse shall be sprayproof and weathertight.

4.1.3 The wheelhouse shall be dimensioned so that it can accomodate at least two persons.

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[1]) A revision of ISO 2923 is in preparation

4.1.4 Access points to the wheelhouse shall be designed so that safe and rapid entry and exit is ensured regardless of its position.

Stairs shall be arranged in longitudinal direction of the ship as far as possible.

Fixed stairs shall be as specified in EN 790.

Wheelhouses that can be lowered shall be fitted with adjustable-height stairs as far as possible in compliance with EN 790. The steps shall be horizontal whatever the angle of the stair.

Wheelhouses that can be lowered shall be fitted with an emergency lowering device.

4.1.5 The free height in the working and traffic area shall be at least 2000 mm. The door width shall be at least 600 mm, and the free door height including coaming at least 1900 mm.

4.1.6 The wheelhouse shall have an adjustable heater to provide a temperature of at least 18°C. Ventilation shall be adjustable and possible also without opening windows and doors. Ventilation and air conditioning systems shall not produce excessive draughts in the working area.

4.1.7 The wheelhouse and its accesss points shall have adequate non-glare general lighting.

4.1.8 In usual operating conditions the noise level of the vessel at head height of the helmsman in the control position shall not exceed 70 dB (A) measured in accordance with ISO 2923.

4.1.9 Suitable installations shall be provided for the wheelhouse to clean the windows without risk.

4.2 View

4.2.1 There shall be an unrestricted view on all sides from the control position.

4.2.2 There shall be no window frames, pillars or structures in the line of sight forward along the centreline of the helmsman 30° starboard and 30° port. As far as possible there shall be no blind spots in the line of sight astern of the helmsman, see figure 1.

4.2.3 The unrestricted field of view from the control position shall cover at least 240° of the horizon. Of this, at least 140° shall be within the forward semi-circle.

The unrestricted field of view shall be distributed uniformly over starboard and port; see figure 1.

The angles of the unrestricted field of view indicated in figure 1 are minimum values, those of the blind spots are maximum values.

4.2.4 The top edge of the window shall be fitted at a height such that from a viewing point at a height of 1800 mm above the wheelhouse deck there is a clear view 10° above the horizontal, see figure 4.

4.2.5 By the arrangement and design of the wheelhouse it shall be ensured that the blind spot forward of the bow of the ship with half stores without ballast shall not exceed 250 m for the helmsman. Optical aids to reduce the blind spots shall not be taken into account.

4.2.6 A clear view through the forward window shall be ensured by suitable means in any weather, e.g. clear-view screen in accordance with ISO 3904.

4.2.7 The windows used shall have a minimum light transmittance value of 75%.

4.2.8 The windows in the front of the wheelhouse shall be glarefree or suitably inclined.

NOTE: An inside inclination is considered suitable to avoid the wheelhouse being heated up, see figure 4.

4.2.9 In the case of push tows, there shall be a clear view of the coupling device from the control position.

5 General control position requirements

5.1 General

5.1.1 The control position shall be structured according to ergonomic criteria. The scope of the displays and operating elements depends on the type of control position (e.g. one-man control position) and the type of the ship.

5.1.2 The number of control position instruments shall be kept as small as possible.

5.1.3 The control position shall have facilities for operating in the sitting and standing position.

5.1.4 Seat

The chair for the helmsman shall be ergonomically designed and meet at least the following requirements:

a) The height of seating shall be individually adjustable.
b) The springing shall be adjustable to the individual weight of the helmsman.
c) The back rest shall be provided with an ajustable spinal support.
d) The arm rests shall be adjustable in height and folded upwards.
e) The foot rest shall be adequately dimensioned as a plate for both feet and its height and inclination shall be adjustable.
f) The fabric of the upholstery should be easy to clean and hard to inflame and permeable to water, vapour and air.
g) The chair shall be so attenuated that no harmful vibrations are transferred to the helmsman.
h) The chair shall be movable in longitudinal direction, but shall not be mounted on rollers.

5.2 Control position arrangement

5.2.1 Supervisory and control elements shall be arranged in logical groups according to the functions they relate to.

5.2.2 Supervisory and control elements shall be permanently installed. The design shall ensure ease of operation and access for maintenance.

5.2.3 It shall be possible for the helmsman to read all instruments without any difficulty and to operate all control elements easily while the vessel is under way.

5.3 Display instruments

Display instruments shall meet the following requirements:

5.3.1 Design and colour

- uniform colour in the wheelhouse
- no digital displays where the reading changes rapidly
- in the case of analogous displays, the scale shall move to the right or clockwise for increasing values
- indicator lights for operation: green, for fault: red
- scale illumination and indicator lights for operation shall be infinitely variable. Indicator lights for faults shall not be adjustable
- the numerals on the scale shall not be covered by the pointer.

5.3.2 Legibility

It shall be possible to read the displays free from glare and reflections.

The character height shall be at least 4 mm and for instruments that have to be read from several positions, at least 7 mm.

Display scales shall be linear and may be dispensed with at the lower end of the scale range if necessary.

5.3.3 Instrument requirements

The requirements are a function of the type and application of the vessel. The following elements shall be taken into account:

- degree of protection in the wheelhouse IP 22 in accordance with EN 60529
- display precision 2,5%
- fatigue resistance and vibration resistance
- temperature stability from -20° C to + 60° C in accordance with IEC 92-101

5.4 Controls

5.4.1 The size of the controls depends on the space available and their importance in navigating the ship.

5.4.2 The controls shall be easy to move into the operating position and to operate. The operational state shall be clearly recognizable.

5.4.3 The effect of the controls on the main drive shall correspond to the required task as appropriate. Each main engine shall be operated only by one control lever which shall move vertically in a plane that is approximately parallel to the longitudinal axis of the vessel.

There must be a clearly distinguishable click as the lever goes into the neutral position. Forward movement of the main engine control lever shall cause the vessel to move ahead and its movement towards the stern shall cause motion astern.

5.4.4 Movement of the steering control lever or other control device shall correspond to the resulting change in heading of the vessel.

5.4.5 Movement of the bow thruster control lever or other control device shall correspond to the resulting transverse movement of the bow of the vessel.

5.4.6 The operating levers for the main rudder and bow thruster and for the main drives including gear or engine reversal shall be capable of being operated with usual manual force. Their length shall generally be limited to 20 cm. They shall not project beyond the vertical edges of the console.

5.5 Control and display

Equivalent control, indicator and supervisory functions are admissible for rudder propeller, water jet, cycloidal propeller and bow steering systems.

The direction of the pushing operation on the vessel or the direction of the jet shall be visible on the indicator for each system in accordance with its location.

5.6 Monitoring

5.6.1 The monitoring system shall be designed so that in general only faults are displayed. Readiness for service and continuous operation only need to be displayed in really necessary cases. During normal operation, no display is necessary.

5.6.2 For protection of the engine the following functions shall be monitored by appropriate means:

- Temperature of the cooling water of the propelling engine,
- Oil pressure of the propelling engine and the driving gear,
- Oil and air pressure of the reversing system of the drive, reversing gear or propeller,
- Fuel level in service tank(s) when it is no longer sufficient for safe operation.

If critical values are reached the alarm shall be given.

5.6.3 For protection of the propulsion system, at least the following functions of the control position shall be monitored:

- Failure of working pressure of the hydraulic system
- Minimum alarme in hydraulic tanks
- Failure of control system electrical supply
- Failure of the main power electrical supply
- Failure of the rate of turn indicator
- Failure of supply of energy for the second independent steering gear
- Failure of the prescribed buffer system

5.6.4 Bilge control for the engine room; alarme if the maximum level is exceeded.

5.7 Arrangement of control position instruments

As far as possible, the arrangement of the control position instruments in the individual reach and visual ranges shall conform to table 1.

6 Additional requirements for one-man control position with radar assistance

6.1 General

6.1.1 It shall be possible for the helmsman to operate from a sitting position, and all display, monitoring and operating equipment needed for the navigation of the vessel shall be arranged in such a way that the helmsman can observe and operate them during the voyage without having to leave his seat and without losing sight of the radar display.

6.1.2 The control position shall be divided into reach and visual ranges for the ergonomic accomodation of display instruments and controls. See figure 2 and figure 3.

6.1.3 If instruments are placed in the deck head area, they shall be located in the hatched area according to figure 4.

6.2 Radar and rate of turn indicator

6.2.1 The radar screen shall be in front of the helmsman so that he can see the radar image without any major change to his line of sight.

6.2.2 The radar image shall remain clearly visible without the aid of a mask or screen, irrespective of the lighting conditions prevailing outside the wheelhouse.

6.2.3 The rate of turn indicator shall be installed directly above or below the radar screen or integrated.

6.3 Operation and display

6.3.1 The steering gear of the vessel shall be controlled by one lever. The angle between the lever and the centreline of the vessel shall reflect the angle of deflection of the rudder blades. If there are several rudder gear drives existing, it shall be recognizable which system is in operation.

6.3.2 If vessels are provided with bow rudders or special rudders for the sternway (flanking rudder) these shall be controlled by special levers.

6.3.3 The switches and indicator lights of the lights and light signals shall be installed in the control position. Arrangement and colour of these indicator lights shall conform to the actual position and colour of the switched lights and light signals.

The switches of the lights shall be integrated into the indicator lights or located adjacent to the indicator lights with which they shall be clearly coordinated.

6.3.4 The sound signals with the exception of the mandatory emergency signals for dangerous goods transports shall be given by floor switches.

6.3.5 The direction of the pushing force operating from the drive to the ship and the speed of the propeller or propelling engines shall be indicated.

6.3.6 The helmsman shall be able to cast the stern anchor without leaving his seat on vessels having a length exceeding 86 m and on vessels which may push tows exceeding a length of 86 m or a width of 22,90 m.

6.4 Telephone equipment

6.4.1 For the vessel-to-vessel service and Nautical Information the reception shall be a loudspeaker and the transmission fixed microphones.

For the switch over from transmitting to receiving operations and vice versa a push bottom shall be provided.

6.4.2 It shall be possible to ensure the following internal intercommunication from the control position:

- to the bow of the vessel or the tow,
- to the stern of the ship or the tow if no direct communication from the control position is possible,
- to the crew's quarters
- to the steersman's cabin

6.5 Arrangement of the control position instruments

The arrangement of the control position instruments in the individual reach and visual ranges is shown in table 1.

7 Wing control position requirements

7.1 If there is a wing control position outside the wheelhouse, the supervisory and control elements there shall be of watertight design.

7.2 A wing control position shall be in operation simultaneously with the central control position. There shall be an unrestricted view between the wing control position and the central control position.

7.3 Indicator lights in the main control position and the wing control position shall show which control position is in operation.