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**ECONOMIC COMMISSION FOR EUROPE**

**INLAND TRANSPORT COMMITTEE**

Working Party on Inland Water Transport

Working Party on the Standardization of  
Technical and Safety Requirements in Inland Navigation  
(Twenty-fifth session, 19 - 21 March 2003,  
agenda item 9)

**RECOMMENDATIONS ON TECHNICAL REQUIREMENTS FOR ELECTRONIC  
NAVIGATIONAL SHIPBORNE EQUIPMENT AND ITS INSTALLATION ON  
BOARD SHIPS, INCLUDING, IN PARTICULAR, RADAR INSTALLATIONS  
AND RATE-OF-TURN INDICATORS**

Note by the secretariat

The Working Party, at its twenty-third session, asked the secretariat to prepare a discussion paper based on the draft amended chapter 10B (TRANS/SC.3/WP.3/2002/2) and supplemented with radar and rate-of-turn indicators' provisions as suggested by Ukraine in TRANS/SC.3/WP.3/2002/12 with due regard to the proposal of the Russian Federation in TRANS/SC.3/WP.3/1999/19 and relevant requirements in force within CCNR and the Danube Commission (TRANS/SC.3/WP.3/47, para. 28).

The discussion paper prepared in accordance with the instructions of the Working Party is reproduced below.

## CHAPTER 10B

### WHEELHOUSE

#### 10B-1 GENERAL REQUIREMENTS

10B-1.1 **It shall be possible to control and monitor propelling machinery and steering gear from the wheelhouse. Propelling machinery fitted with a clutch which can be operated from the wheelhouse or actuating a rudder propeller which can be operated from the wheelhouse may be started and stopped only from the engine room.**<sup>1/</sup>

10B-1.2 Every engine shall be controlled by a single lever moving through the arc of a circle in a vertical plane more or less parallel to the longitudinal axis of the vessel. Forward movement of the lever shall cause the vessel to move forward and movement of the lever towards the stern shall cause the vessel to move astern. **Engaging and reversing the engine shall be carried out by the lever. The neutral position of the lever shall be indicated by a perceptibly distinguishable click or by a perceptibly distinguishable marking.**<sup>2/</sup> The sweep of the lever from the neutral position to the "full speed ahead" position and from the neutral position to the "full speed astern" position shall not exceed 90°.

10B-1.3 The wheelhouse shall be equipped with adjustable heating **and ventilation systems.**<sup>3/</sup> The wheelhouse darkening device shall not interfere with ventilation.

10B-1.4 **The glazing used in wheelhouses shall display a light transmission of at least 75%.**<sup>4/</sup>

10B-1.5 Under normal operating conditions, the sound-pressure level of the noise produced by the vessel shall not exceed 70 dB (A) at the helmsman's head position. However, the Administration may authorize a sound-pressure level of 75 dB (A) at the helmsman's head position for vessels not more than 30m in length, with the exception of pushers.

10B-1.6 **Tell-tale lamps or any other equivalent device for monitoring the signal lights shall be installed in the wheelhouse unless that monitoring can be performed direct from the wheelhouse.**<sup>5/</sup>

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<sup>1/</sup> See the Regulations for the Inspection of Rhine Vessels (RVBR), article 7.04.1 (TRANS/SC.3/WP.3/1998/5).

<sup>2/</sup> See RVBR, article 7.04.2.

<sup>3/</sup> See RVBR, article 7.10.

<sup>4/</sup> See RVBR, article 7.02.5.

<sup>5/</sup> See RVBR, article 7.05.2.

## 10B-2 UNOBSTRUCTED VIEW

10B-2.1 The view from the helmsman's station shall be sufficiently unobstructed in all directions.

10B-2.2 A sufficiently unobstructed view in all directions from the helmsman's station shall be deemed to be provided if the following conditions are met:

- (i) The unobstructed field of view from the helmsman's position shall cover at least 240° of the horizon, including at least 140° in the forward half-circle;
- (ii) No window frames, posts, etc. shall be placed in the helmsman's normal line of vision;
- (iii) The view through the windows in the helmsman's normal line of vision shall be kept clear under all weather conditions (rain, snow, frost) by suitable devices;
- (iv) **If a sufficiently unobstructed view cannot be ensured astern, the competent authority on the inspection of vessels may require other measures to be taken, such as the installation of auxiliary optical devices.** <sup>6/</sup>

**10B-2.3 The dead area of vision forward of the bow of the unloaded vessel shall not extend beyond 250 m. The use of optical devices to reduce the dead area shall be left out of consideration for the purposes of this requirement.**

## 10B-3 REQUIREMENTS CONCERNING CONTROL, DISPLAY AND MONITORING EQUIPMENT <sup>7/</sup>

10B-3.1 The controls shall move easily into the operating position, which shall be unmistakably clear.

10B-3.2 Monitoring instruments shall be easy to read whatever the lighting conditions inside the wheelhouse. Their illumination shall be capable of continuous adjustment to the point of extinction, so that the illumination is not dazzling and at the same time there is no impairment of visibility.

10B-3.3 **There shall be a system for testing the warning lights.** <sup>8/</sup>

10B-3.4 **It shall be possible clearly to establish whether a system is in operation. If its functioning is indicated by means of a warning light the latter shall be green.** <sup>2/</sup>

10B-3.5 **Any malfunctioning or failure of systems that require monitoring shall be indicated by means of red warning lights.** <sup>10/</sup>

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<sup>6/</sup> See RVBR, article 7.02.3 (TRANS/SC.3/WP.3/1998/5).

<sup>7/</sup> See RVBR, article 7.04.

<sup>8/</sup> See RVBR, article 7.03.3.

<sup>9/</sup> See RVBR, article 7.03.4.

<sup>10/</sup> See RVBR, article 7.03.5.

10B-3.6 An audible warning shall sound at the same time that the red warning lights light up. The audible warnings may consist of a single, common signal. The sound pressure level of that signal shall exceed the maximum sound pressure level of the ambient noise at the steering position by at least 3 dB(A).<sup>11/</sup>

10B-3.7 The audible warning system may be switched off after the malfunction or failure has been confirmed. That shutdown shall not prevent the alarm signal from being triggered by other malfunctions. The red warning lights shall only go out when the malfunction has been corrected.<sup>12/</sup>

10B-3.8 The monitoring and display devices shall be automatically connected to an alternative power supply if the main power supply fails.<sup>13/</sup>

10B-3.9 Devices for the remote control of the steering gear as a whole shall be installed permanently and so that the heading selected is clearly visible. If the remote control devices can be disengaged, they shall be fitted with an indicator showing whether the device is “in use” or “not in use”. The arrangement and the manipulation of the controls shall be functional. Impermanent remote-control equipment for systems that are subsidiary to the steering system, such as active bow thruster, shall be acceptable provided that such a subsidiary installation can be activated by means of an override at any time within the wheelhouse.<sup>14/</sup>

#### 10B-4 RADAR EQUIPMENT AND RATE-OF-TURN CONTROL

10B-4.1 The radar equipment and rate-of-turn indicators must be of types that have been approved by the competent authorities. ~~The requirements of the competent authority concerning installation and operational monitoring shall be met<sup>15/</sup>. The requirements of the competent authority concerning installation and operational monitoring shall be met<sup>16/</sup>.~~

10B-4.2 The radar indicator must be located in such a way as to permit the boatmaster to monitor the situation around the vessel on the indicator and to control the vessel from his post. The distance from the rudder controls on the boatmaster's control panel to the radar indicator shall not exceed 800 mm.

10B-4.3 Cordless remote control panels for radar equipment are not permitted.

10B-4.4 The radar equipment must have a built-in operational monitoring feature permitting the boatmaster to check variations in operating parameters and to set the instrument correctly when radar targets are unavailable.

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<sup>11/</sup> See RVBR, article 7.03.6.

<sup>12/</sup> See RVBR, article 7.03.7.

<sup>13/</sup> See RVBR, article 7.03.8.

<sup>14/</sup> See RVBR, article 7.04.8.

<sup>15/</sup> See RVBR, article 7.06.1, as modified by Ukraine in TRANS/SC.3/WP.3/2002/12.

<sup>16/</sup> This phrase has been moved to para. 10B-4.11 as proposed by Ukraine.

10B-4.5 The image on the radar indicator must be clearly visible irrespective of the lighting conditions in the wheelhouse. The illumination of the controls and the indicator should not be so intense as to dazzle the boatmaster when he is operating the vessel.

10B-4.6 The radar antenna must be installed so as to ensure that there is the best possible coverage on the indicator screen along the vessel's course, with no dead sectors within 5° to port or starboard, and that the coverage of the horizon is, if possible, unobstructed by superstructure, piping or other structures.

10B-4.7 The antenna must be installed sufficiently high up to ensure that the high-frequency radiation flux density on open decks where there may be people does not exceed the permitted level.

10B-4.8 Onboard radar equipment must be electrically operated from the main and emergency power supplies.

10B-4.9 The technical specifications of radar equipment must satisfy the following requirements <sup>17/</sup>:

Minimum range of detection	15 m
Maximum range <sup>18/</sup> of detection of shore 60 m high (at height of installation 10 m <sup>19/</sup> )	37,000 m (for cm-band radar); 14,000 m (for mm-band radar).
Distance resolution	15 m at scales 0.5 - 1.6 km <sup>20/</sup> ; 1% of the scale value at other scales.
Angular resolution <sup>21/</sup> On vessels of less than 1,600 register tons	1°; Not more than 3°;
Accuracy of measurement, range	1% of variable range circles; 10 m fixed range circles at scales 0.5 - 2.0 km <sup>22/</sup> ; 0.8% of the value of the selected scale.
Accuracy of measurement, bearings	±1° <sup>23/</sup>
Heading line: - Width	0.5°

<sup>17/</sup> Paras. 10B-4.2 – 10B-4.9 reflect paras. 11-3.1 – 11.3.8 of the proposal of the Russian Federation in TRANS/SC.3/WP.3/1999/19.

<sup>18/</sup> Germany in TRANS/SC.3/WP.3/2000/11 pointed out that the proposed maximum range is not required in inland navigation since it would be contrary to the objective that the transmission power should be as low as possible. This requirement is only useful for sea radar equipment for coastal shipping.

<sup>19/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed "7 m above water level" instead of "10 m".

<sup>20/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed changing the bottom of the scale from 0.5 - 1.6 to **0.4 - 1.6 km**

<sup>21/</sup> Germany indicated in TRANS/SC.3/WP.3/2000/11: "Different requirements as to small and large vessels with regard to the angular resolution are not useful in the case of inland navigation. The German/CCNR regulations provide for an angular resolution of **1.2°** or smaller irrespective of the ship's tonnage".

<sup>22/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed changing the range from 0.5 – 2.0 to **0.4 – 2.0 km**

<sup>23/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed replacing 1° by **0.5°**.

- Deviation	0.5°
Effective diameter of screen indicator	180 mm for vessels from 500 to 1,600 register tons; 270 mm for vessels of over 1,600 register tons <sup>24/</sup> .
Range scales <sup>25/</sup>	0.5 <sup>26/</sup> ; 1; 1.6; 2; 3.2; 4; 8; 16; 32 km. Not less than 4 fixed range circles within each scale.
Off - centring	1/4 - 1/3 of the effective diameter of the image.
Bearing facilities:	Up to 5 seconds
- Timing	±1°
- Error	
Transmission frequency	9 GHz (3.2 cm); 33.2 GHz (9 mm) <sup>27/</sup>
Warm - up time	4 minutes
Antenna speed	Minimum 18 revolutions per minute <sup>28/</sup>

10B-4.10 Radar equipment may be installed on board vessels only following tests to determine whether they conform to the provisions laid down in these requirements and by national authorities<sup>29/</sup>.

10B-4.11 The rate-of-turn indicator must be located ahead of the helmsman and within his field of vision<sup>30/</sup>, and as close as possible to the screen of the radar equipment<sup>31/</sup>.

10B-4.12 Where rate-of-turn regulators are used, it shall be possible to release the rate-of-turn control in any position without any change occurring in the selected rate. The sector through which the control rotates shall be large enough to ensure that it can be positioned with sufficient accuracy.

<sup>24/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed "at least **180 mm** for vessels from 300 to 1,600 grt and **250 mm** for vessels of more than 1,600 grt". Germany in TRANS/SC.3/WP.3/2000/11: "Different requirements as to small and large vessels with regard to the diameter of the screen are not necessary for inland navigation. The German/CCNR regulations provide for a screen diameter of at least **270 mm** irrespective of the ship's tonnage".

<sup>25/</sup> Germany in TRANS/SC.3/WP.3/2000/11: "Non-conforming range scales between the German/CCNR regulations and the Russian proposal are to be found at 0.8, 1.0, 1.2 and 3.2 km. All other range scales correspond to each other. It is, however, not comprehensible, that according to the width of the river estuaries navigated, the optimum range scales can be different. Here, it should be left up to the competent authorities to lay down range scales by means of a footnote".

<sup>26/</sup> Ukraine in TRANS/SC.3/WP.3/2002/12 proposed changing the minimum value of the distance scale from 0.5 km for **0.4 km**.

<sup>27/</sup> Germany in TRANS/SC.3/WP.3/2000/11: "In inland navigation, only the frequency range of **9.3 to 9.5 GHz (3.2 cm)** can be permitted. Tests carried out with 30-GHz facilities have shown that these frequency ranges are not suitable since the reflections in the case of rain and snow are too strong, making the radar image unusable. The equipment of the waterways, too, especially the radar absorbers for the reduction of multiple reflections at bridges are adapted to the frequency range around 9.4 GHz".

<sup>28/</sup> Germany in TRANS/SC.3/WP.3/2000/11: "The German/CCNR regulations require at least **24 revolutions per minute**. S band antennas (10 cm) which revolve more slowly are only available on sea-going vessels".

<sup>29/</sup> Para. 11-3.10 of the Russian proposal in TRANS/SC.3/WP.3/1999/19. Ukraine in TRANS/SC.3/WP.3/2002/12 believes that the content of this para. lies within the competency of the national administrations and therefore should not perhaps be included in the annex to resolution No. 17, revised.

<sup>30/</sup> See RVBR, article 7.06.1.

<sup>31/</sup> Ukrainian proposal in TRANS/SC.3/WP.3/2002/12.

The neutral position shall be perceptibly distinguishable from the other positions. Illumination of the scale shall be continuously adjustable. <sup>32/</sup> <sup>33/</sup>

10B-3.13 Departures from or additions to the requirements listed above shall be permitted on condition that all departures and additions are validated by the establishment of better working conditions for boatmasters or the improvement of the operating and technical specifications of radar equipment <sup>34/</sup>.

## **10B-5 ALARM SYSTEM**

**10B-5.1** The helmsman must have within reach an on/off switch controlling the alarm signal; switches which automatically return to the off position when released are not acceptable.

**10B-5.2** There shall be a general alarm system as well as an independent alarm system enabling to reach open decks; accommodation spaces; engine rooms; pump rooms, where appropriate, and other service premises.

**10B-5.3** The sound pressure level for the alarm signal shall be at least 75 dB(A) within the accommodation area. In the engine rooms and pump rooms the alarm signal shall take the form of a flashing light that is visible on all sides and clearly perceptible at all points.

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<sup>32/</sup> See RVBR, article 7.04.7.

<sup>33/</sup> Former para. 10B-4.2.

<sup>34/</sup> Para. 11-3.11 of the Russian proposal in TRANS/SC.3/WP.3/1999/19.