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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

###### Fifty-first session

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Item 3 (c) of the provisional agenda

##### **Standardization of technical and safety requirements in inland navigation: Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (Resolution No. 61, revised)**

### **Aligning of provisions for the navigation and information equipment in the Annex to Resolution No. 61, revised, with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)**

#### Note by the secretariat

## I. Mandate

1. This document is submitted in line with cluster 5: Inland Waterway Transport, para. 5.1 of the programme of work 2016-2017 (ECE/TRANS/2016/28/Add.1) adopted by the Inland Transport Committee at its seventy-eighth session on 26 February 2016.

2. It is recalled that, following the decision of the Working Party on Inland Water Transport (SC.3) at its sixtieth session to align the Annex with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)<sup>1</sup> (ECE/TRANS/SC.3/203, para. 67) adopted by the European committee for drawing up common standards in the field of inland navigation (CESNI). SC3/WP3 asked the secretariat to continue revising the Annex to Resolution No. 61 on the basis of the analysis set out in ECE/TRANS/SC.3/WP.3/2017/7 (ECE/TRANS/SC.3/WP.3/100, para. 42).

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<sup>1</sup> [www.cesni.eu/documents/es-trin/](http://www.cesni.eu/documents/es-trin/)

3. SC.3/WP.3 may wish to use the text of the ES-TRIN provisions reproduced in the Annex to this document as the basis for updating Chapter 7 of the Annex to Resolution No. 61 and developing a new Appendix to introduce provisions for navigation and information equipment.

## Annex

### **Proposal for updating Chapter 7 of the Annex to Resolution No. 61, revised, and a new Appendix, Navigation and information equipment**

#### **I. Proposal for updating Chapter 7, Wheelhouse**

The present Section reproduces the text of Article 7.06.3 of ES-TRIN.

**“Article 7.06  
Navigation and information equipment**

...

3. Inland AIS equipment shall meet the requirements of the current “Vessel Tracking and Tracing Standard for Inland Navigation”.

The requirements of Annex 5 must be complied with.”

#### **II. Proposal for a new Appendix, Navigation and information equipment**

The present Section reproduces the text of Annex 5 to ES-TRIN.<sup>2, 3</sup>

**“ANNEX 5  
NAVIGATION AND INFORMATION EQUIPMENT**

**Contents**

Definitions

1. 'Type test' means the test procedure as referred to in Section I Article 4 or Section II Article 1.03 which the technical service uses to test for compliance with the requirements according to this Annex. The type test forms an integral part of the type approval.
2. 'Type approval' means the administrative procedure according, by which a Member State confirms that equipment complies with the requirements of this Annex.
3. 'Test certificate' means the document in which the type testing results are laid down.
4. 'Applicant' or 'manufacturer' means any legal or natural person under whose name, trademark or any other form of identification the equipment submitted for testing is manufactured or marketed and who is responsible for all matters as regards the type testing and type approval procedure in respect of the technical service and the approval authority.
5. 'Technical service' means the institution, authority or organisation that does the type testing.

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<sup>2</sup> Note of the secretariat: Annex 5 is being currently under revision. Once adopted by CESNI, the update will be issued as a separate document.

<sup>3</sup> Note of the secretariat: Contents, Appendix to Chapter 5 and Section VII are not reproduced in this document.

6. 'Manufacturer's declaration' means the declaration by which a manufacturer gives the assurance that the equipment meets the prevailing minimum requirements and that is identical in every respect to the type submitted for testing.

7. 'Declaration of conformity according to Directive 1999/5/EC<sup>4</sup>' means the declaration according to Directive 1999/5/EC Annex II(1), by which the manufacturer confirms that the products in question meet the applicable requirements of the Directive.

## **Section I**

### **Minimum requirements and test conditions for navigational radar installations in inland navigation**

#### **Article 1 Scope**

These provisions set out the minimum requirements for navigational radar installations used in inland navigation as well as the conditions for testing conformity with these minimum requirements.

#### **Article 2 Purpose of the navigational radar installation**

The navigational radar installations shall facilitate the navigation of the vessel by providing an intelligible radar picture of its position in relation to buoys shorelines and navigational structures, as well as permitting the reliable and timely recognition of other vessels and obstructions protruding above the surface of the waterway.

#### **Article 3 Minimum requirements**

1. Navigational radar installations shall meet the requirements of Directive 1999/5/EC.
2. Navigational radar installations shall also meet the requirements of the European Standard EN 302 194-1 : 2006 Electromagnetic compatibility and Radio spectrum Matters (ERM); Navigational radar used on inland waterways: Part 1: Technical characteristics and methods of measurement.

#### **Article 4 Type tests**

Compliance with the minimum requirements as specified in Article 3(1) and (2) shall be established by means of a type test.

If the equipment passes the type test the technical service shall issue a test certificate. If the equipment fails to meet the minimum requirements, the applicant shall be notified in writing of the reasons for its rejection.

#### **Article 5 Application for a type test**

1. Applications for a type test of the navigational radar installation shall be submitted to a competent technical service.
2. Each application shall be accompanied by the following documents
  - (a) Two detailed technical descriptions;

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<sup>4</sup> Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (OJ L 91 of 7.4.1999).

- (b) two complete sets of installation and service documents;
- (c) two detailed operator's manuals;
- (d) two short operator's manual;
- (e) where applicable, evidence of previously completed tests.

3. In case it is not intended by the applicant to have the Declaration of Conformity pursuant to Directive 1999/5/EC established concurrently with the type-approval, a Declaration of Conformity shall be submitted together with the application for a type test.

### **Article 6** **Type-approval**

1. Type-approval shall be granted by the competent authority pursuant to the test certificate.
2. Each competent authority or the technical service designated by the competent authority shall be entitled to select equipment from the production series at any time for inspection

If this inspection reveals defects in the equipment, type-approval may be withdrawn. The type-approval shall be withdrawn by the authority that issued it.

### **Article 7** **Marking of the equipment and type approval number**

1. Each component of the equipment shall be marked indelibly with the name of the manufacturer, the trade designation of the equipment, the type of equipment and the serial number.
2. The type-approval number assigned by the competent authority shall be affixed indelibly to the display unit in such a way that it remains clearly visible after the equipment has been installed. Composition of a type-approval number: R-NN-NNN or e-NN-NNN

R = Rhine  
e = European Union  
NN = number for the country of type-approval, where

01 = Germany	19 = Romania
02 = France	20 = Poland
03 = Italy	21 = Portugal
04 = Netherlands	23 = Greece
05 = Sweden	24 = Ireland
06 = Belgium	25 = Croatia
07 = Hungary	26 = Slovenia
08 = Czech Republic	27 = Slovakia
09 = Spain	29 = Estonia
11 = United Kingdom	32 = Latvia
12 = Austria	34 = Bulgaria
13 = Luxembourg	36 = Lithuania
14 = Switzerland	49 = Cyprus
17 = Finland	50 = Malta
18 = Denmark	

NNN = three-digit number, to be determined by the competent authority.

**Article 8**  
**Manufacturer's declaration**

Each unit of equipment shall be accompanied by a manufacturer's declaration.

**Article 9**  
**Modifications to type-approved equipment**

1. Any modification made to equipment already approved shall cause the type-approval to be forfeit.

Whenever modifications are planned, details shall be sent in writing to the competent technical service.

2. The competent authority shall decide following consultation with the technical service whether the type-approval still applies or whether an inspection or new type test is necessary.

If a new type test is granted, a new type-approval number shall be assigned.

**Section II**

**Minimum requirements and test conditions for rate-of-turn indicators  
in inland navigation**

**CHAPTER 1**  
**GENERAL**

**Article 1.01**  
**Scope**

These provisions set out the minimum requirements for rate-of-turn indicators in inland navigation, as well as the conditions for testing conformity with these minimum requirements.

**Article 1.02**  
**Purpose of the rate-of-turn indicator**

The rate-of-turn indicator is intended to facilitate radar navigation, and to measure and indicate the rate of turn of the vessel to port or starboard.

**Article 1.03**  
**Type test**

1. Compliance with the minimum requirements for rate-of-turn indicators pursuant to Chapters 2 to 4 shall be established by means of a type test.

2. If the equipment passes the type test the technical service shall issue a test certificate. If the equipment fails to meet the minimum requirements, the applicant shall be notified in writing of the reasons for its rejection.

**Article 1.04**  
**Application for a type test**

1. Applications for a type test of a rate-of-turn indicator shall be submitted to a competent technical service.

2. Each application shall be accompanied by the following documents:

- (a) two detailed technical descriptions;
- (b) two complete sets of installation and service documents;

(c) two operating instructions.

3. By means of tests, the applicant shall establish or have it established that the equipment meets the minimum requirements of these provisions.

The results of the test and the measurement reports shall be attached to the application.

These documents and the information obtained during testing shall be kept by the competent authority.

#### **Article 1.05 Type approval**

1. Type approval shall be granted by the competent authority pursuant to the test certificate.

2. Each competent authority or the technical service designated by the competent authority shall be entitled to select equipment from the production series at any time for inspection.

If this inspection reveals defects in the equipment, type approval may be withdrawn. The type-approval shall be withdrawn by the authority that issued it.

#### **Article 1.06 Marking of the equipment and type approval number**

1. Each component of the equipment shall be marked indelibly with the name of the manufacturer, the trade designation of the equipment, the type of equipment and the serial number.

2. The type-approval number assigned by the competent authority shall be affixed indelibly to the control unit in such a way that it remains clearly visible after the equipment has been installed. Composition of a type-approval number: R-NN-NNN or e-NN-NNN

R	=	Rhine
e	=	European Union
NN	=	number for the country of type-approval, where

01 = Germany	19 = Romania
02 = France	20 = Poland
03 = Italy	21 = Portugal
04 = Netherlands	23 = Greece
05 = Sweden	24 = Ireland
06 = Belgium	25 = Croatia
07 = Hungary	26 = Slovenia
08 = Czech Republic	27 = Slovakia
09 = Spain	29 = Estonia
11 = United Kingdom	32 = Latvia
12 = Austria	34 = Bulgaria
13 = Luxembourg	36 = Lithuania
14 = Switzerland	49 = Cyprus
17 = Finland	50 = Malta
18 = Denmark	

NNN = three-digit number, to be determined by the competent authority.

3. The type-approval number shall be used only in conjunction with the associated type-approval. It shall be the responsibility of the applicant to produce and affix the type-approval number.

**Article 1.07**  
**Manufacturer's declaration**

Each unit of equipment shall be accompanied by a manufacturer's declaration.

**Article 1.08**  
**Modifications to type-approved equipment**

1. Any modification made to equipment already approved shall cause the type-approval to be forfeit.

Whenever modifications are planned, details shall be sent in writing to the competent technical service.

2. The competent authority shall decide following consultation with the technical service whether the type-approval still applies or whether an inspection or new type test is necessary.

If a new type test is granted, a new type approval number shall be assigned.

**CHAPTER 2**  
**GENERAL MINIMUM REQUIREMENTS FOR RATE-OF-TURN INDICATORS**

**Article 2.01**  
**Construction, design**

1. Rate-of-turn indicators shall be suitable for operation on board inland navigation vessels.
2. The construction and design of the equipment shall be in accordance with current good engineering practice, both mechanically and electrically.
3. In the absence of any specific provision in this Standard, the requirements and test methods contained in European Standard EN 60945 : 2002 shall apply to power supply, safety, mutual interference of ship borne equipment, compass safe distance, resistance to climatic influences, mechanical strength, environmental influences, audible noise emission and equipment markings.

The equipment shall satisfy all requirements of this Annex at ambient temperatures between 0 °C and + 40 °C.

**Article 2.02**  
**Spurious emissions and electromagnetic compatibility**

1. General requirements  
Rate-of-turn indicators shall meet the requirements of Directive 2004/108/EC.<sup>5</sup>
2. Spurious emissions

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<sup>5</sup> Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (OJ L 390, 31.12.2004).



In the frequency ranges of 156-165 MHz, 450-470 MHz and 1.53-1.544 GHz, the field strength shall not exceed a value of 15  $\mu$ V/m. These field strengths shall apply at a test distance of 3 metres from the equipment under test.

#### **Article 2.03** **Operation**

1. The equipment shall not have more control units than are necessary for its correct operation.

The design, markings and manipulation of the control units shall be such as to permit their simple, unambiguous and fast operation.

Their arrangement shall be such as to prevent operational mistakes as far as possible

Control units that are not necessary for normal operation shall not be immediately accessible.

2. All controls and indicators shall be provided with symbols and/or markings in English. Symbols shall meet the requirements of European Standard EN 60417 : 1998 (graphical symbols for use on electrical equipment).

All numerals and letters shall be at least 4 mm high. If it can be demonstrated that, for technical reasons, numerals and letters 4 mm high are not possible and if for the purposes of operation smaller numerals and letters are acceptable, a reduction to 3 mm shall be allowed.

3. The equipment shall be designed in such a way that operating mistakes cannot cause its failure.

4. Any functions over and above the minimum requirements, such as facilities for connection to other equipment, shall be provided in such a way that the equipment meets the minimum requirements under all conditions.

#### **Article 2.04** **Operator's manual**

A detailed operator's manual shall be supplied with each unit. It shall be available in Dutch, English, French and German and shall contain at least the following information:

- (a) activation and operation;
- (b) maintenance and servicing;
- (c) general safety provisions.

#### **Article 2.05** **Installation of the sensor**

The direction of installation in relation to the keel line shall be indicated on the rate-of-turn indicator's sensor unit. Installation instructions shall be provided to ensure maximum insensitivity to other normal movements of the vessel.

### **CHAPTER 3** **MINIMUM OPERATIONAL REQUIREMENTS FOR RATE-OF-TURN** **INDICATORS**

#### **Article 3.01** **Operational readiness of the rate-of-turn indicator**

1. From a cold start, the rate-of-turn indicator shall be fully operational within 4 minutes and shall operate to within the required accuracy tolerances.

2. A warning signal shall indicate that the indicator is switched on. It shall be possible to observe and operate the rate-of-turn indicator simultaneously.
3. Cordless remote controls shall not be permitted.

**Article 3.02**

**Indication of the rate of turn**

1. The rate of turn shall be indicated on a linear graduated scale having the zero point situated in the middle. It shall be possible to read the direction and extent of the rate of turn with the necessary accuracy. Indicators other than needle indicators and bar-graphs shall not be permitted.
2. The indicator scale shall be at least 20 cm long and may be circular or rectilinear. Rectilinear scales may be arranged horizontally only.
3. Digital-only indicators will not be accepted.

**Article 3.03**

**Measuring ranges**

Rate-of-turn indicators may be provided with one or more measuring ranges. The following measuring ranges are recommended:

- 30°/min
- 60°/min
- 90°/min
- 180°/min
- 300°/min.

**Article 3.04**

**Accuracy of the indicated rate of turn**

The indicated rate of turn shall not differ by more than 2 % from the measurable maximum value or by more than 10 % from the actual value; whichever is the greater (see Appendix).

**Article 3.05**

**Sensitivity**

The operating threshold shall be less than or equal to a change in angular speed equivalent to 1 % of the indicated value.

**Article 3.06**

**Monitoring of operation**

1. If the rate-of-turn indicator does not operate within the required accuracy range, this shall be indicated.
2. If a gyroscope is used, any critical fall in the rate of rotation of the gyroscope shall be signalled by an indicator. A critical fall in the rate of rotation of the gyroscope is one which lowers accuracy by 10 %.

**Article 3.07**

**Insensitivity to normal movements of the vessel**

1. Rolling of the vessel of up to 10° at a rate of turn of up to 4°/s shall not give rise to measurement errors in excess of the stipulated tolerances.

2. Impacts such as those that may occur during berthing shall not give rise to measurement errors in excess of the stipulated tolerances.

**Article 3.08**  
**Insensitivity to magnetic fields**

The rate-of-turn indicator shall be insensitive to magnetic fields which typically occur on board the vessel.

**Article 3.09**  
**Slave indicators**

Slave indicators shall comply with all requirements applicable to rate-of-turn indicators

**CHAPTER 4**  
**MINIMUM TECHNICAL REQUIREMENTS FOR RATE-OF-TURN INDICATORS**

**Article 4.01**  
**Operation**

1. All controls shall be so arranged that during their operation no information is concealed from view and radar navigation remains unimpaired.
2. All control units and indicators shall be provided with a dazzle-free source of lighting appropriate for all ambient lighting conditions and adjustable down to zero by means of an independent control.
3. Adjustment of control units shall be such that movements to the right or upwards have a positive effect on the variable and movements to the left or downwards a negative effect.
4. If push-buttons are used, it shall be possible to locate and operate them by touch. They shall also have clearly perceptible contact release. If pushbuttons have multiple functions, it must be apparent which hierarchical level is active.

**Article 4.02**  
**Damping devices**

1. The sensor system shall be damped for critical values. The damping constant (63 % of the limit value) shall not exceed 0.4 seconds.
2. The indicator shall be damped for critical values.  
Control units for increasing damping shall be permitted.  
Under no circumstances shall the damping constant exceed 5 seconds.

**Article 4.03**  
**Connection of additional equipment**

1. If the rate-of-turn indicator can be connected to slave indicators or similar equipment, the rate-of-turn indication shall remain usable as an analogue electric signal. In addition, the rate-of-turn indicator may possess a digital interface in accordance with (2).

The rate of turn shall continue to be indicated with galvanic earth insulation and the equivalent to an analogue voltage of  $20 \text{ mV}/^\circ/\text{min} \pm 5 \%$  and a maximum internal resistance of  $100 \Omega$ .

Polarity shall be positive when the vessel is turning to starboard and negative when it is turning to port.

The operating threshold shall not exceed  $0.3^\circ/\text{min}$ .

Zero error shall not exceed 1°/min at temperatures from 0 °C to 40 °C.

With the indicator switched on and the sensor not exposed to the effects of movement, the spurious voltage at the output signal measured with a 10 Hz pass-band low-pass filter shall not exceed 10 mV.

The rate-of-turn signal shall be received without additional damping beyond the limits referred to in Article 4.02(1).

2. A digital interface shall be designed pursuant to European Standards EN 61162-1 : 2008, EN 61162-2 : 1998 and EN 61162-3 : 2008.

3. An external alarm switch shall be provided. The switch shall be installed as a galvanic insulation break-switch for the indicator.

The external alarm shall be triggered by contact closure:

- (a) if the rate-of-turn indicator is disconnected; or
- (b) if the rate-of-turn indicator is not in operation; or
- (c) if the operating control has reacted following an excessive error (Article 3.06).

## **CHAPTER 5**

### **TEST CONDITIONS AND PROCEDURES FOR RATE-OF-TURN INDICATORS**

#### **Article 5.01**

##### **Safety, load capacity and electromagnetic compatibility**

Power supply, safety, mutual interference of ship borne equipment, compass safe distance, resistance to climatic influences, mechanical strength, environmental impact, audible noise emission and electromagnetic compatibility shall be tested in accordance with European Standard EN 60945 : 2002.

#### **Article 5.02**

##### **Spurious emissions**

Spurious emissions shall be measured in accordance with European Standard EN 60945 : 2002 in the frequency range of 30 to 2000 MHz.

The requirements of Article 2.02(2) shall be met.

#### **Article 5.03**

##### **Test procedure**

1. Rate-of-turn indicators shall be tested under nominal and boundary conditions. In this regard, the influence of the operating voltage and of the ambient temperature shall be tested as far as the prescribed limit value.

In addition, radio transmitters shall be used to set up the maximum magnetic fields in the vicinity of the indicators.

2. Under the conditions described in (1), indicator errors shall remain within the tolerances indicated in the Appendix.

All minimum requirements of Chapters 2 to 4 shall be met.

### **Section III**

#### **Requirements for installation and performance tests for navigational radar installations and rate-of-turn indicators in inland navigation**

##### **Article 1**

###### **General**

1. Installation and performance tests of navigational radar installations and rate-of-turn indicator systems must take place according to the following provisions.
2. Only equipment with a type approval according to Section I Article 6 or Section II Article 1.05, or with a type approval recognised as equivalent shall be authorised for installation.

##### **Article 2**

###### **Approved specialist firms**

1. The installation, replacement, repair or maintenance of navigational radar installations and rate-of-turn indicators shall be carried out only by specialist firms approved by the competent authority.
2. Approval may be withdrawn by the competent authority.

##### **Article 3**

###### **Requirements for on-board power supply**

All power supply leads for navigational radar installations and rate-of-turn indicators shall have their own separate safety device and, if possible, be fail-safe.

##### **Article 4**

###### **Installation of the radar antenna**

1. The radar antenna shall be installed as close as possible to the fore-and-aft-line. There shall be no obstruction in the vicinity of the antenna causing false echoes or unwanted shadows; if necessary, the antenna shall be mounted on the fore-castle. The mounting and attachment of the radar antenna in its operational position shall be sufficiently stable to enable the navigational radar installation to perform within the required accuracy limits.
2. After the angular error in the mounting has been corrected and the equipment has been switched on, the difference between lubber line and fore-and-aft-line shall not be greater than 1°.

##### **Article 5**

###### **Installation of the display unit and the control unit**

1. The display unit and control unit shall be installed in the wheelhouse in such a way that the evaluation of the radar image and the operation of the navigational radar installation present no difficulty. The azimuthal orientation of the radar image shall be in accordance with the normal situation of the surroundings. Holders and adjustable consoles shall be constructed in a way that they can be fixed in each position free of vibration.
2. During radar navigation, artificial lighting shall not be reflected in the direction of the radar operator.
3. When the control unit is not part of the display unit, it shall be located in housing within 1 metre of the display unit. Cordless remote controls shall not be permitted.
4. If slave indicators are installed, they shall satisfy the requirements which apply to navigational radar installations.

**Article 6**  
**Installation of the rate-of-turn indicator**

1. The rate-of-turn indicator shall be located ahead of the helmsman and within their field of vision.
2. The sensor system shall be installed as far as possible amidships, horizontal and aligned with the ship's fore-and aft-line. The installation site shall as far as possible be free of vibration and be liable only to modest temperature variations. The indicator unit shall if possible be installed directly above the radar display.
3. If slave indicators are installed, they shall satisfy the requirements which apply to rate-of-turn indicators.

**Article 7**  
**Installation of the position sensor**

For inland ECDIS equipment which is operated in navigation mode, the position sensor (e.g. DGPS antenna) must be installed in such a way as to ensure that it operates with the greatest possible degree of accuracy and is not adversely affected by superstructures and transmitting equipment on board ship.

**Article 8**  
**Installation and performance test**

Before the equipment is switched on for the first time after installation, in case of periodical inspection in order to extend the validity of the inland navigation certificate, as well as after each modification of the vessel likely to affect the operating conditions of the equipment, an installation and performance test shall be carried out by the competent authority or by a specialist firm authorised in accordance with Article 2. For this purpose, the following conditions shall be fulfilled:

- (a) the power supply shall have a separate safety device;
- (b) the operating voltage shall be within the tolerance;
- (c) the cabling and its installation shall satisfy the provisions of this Standard and, if applicable ADN;
- (d) the rate of antenna revolutions shall reach at least 24 rpm;
- (e) there shall be no obstruction in the vicinity of the antenna which impairs navigation;
- (f) the safety switch of the antenna, if provided, shall be in good working order;
- (g) the arrangement of display units, rate-of-turn indicators and control units shall be ergonomic and user-friendly;
- (h) the lubber line of the navigational radar installation shall not deviate from the ship's fore-and-aft-line by more than 1°;
- (i) the accuracy of the range and azimuthal displays shall satisfy the requirements (measurements using known targets);
- (j) linearity in short ranges shall be correct (pushing and pulling);
- (k) the displayed minimum range shall be 15 metres or less;
- (l) the centre of the picture shall be visible and its diameter shall not exceed 1 mm;

- (m) false echoes caused by reflections and unwanted shadows on the lubber line shall not occur or shall not impair the safety of navigation;
- (n) sea-clutter and rain-clutter suppressors (STC and FTC preset) and the associated controls shall perform correctly;
- (o) the gain adjustment shall be in proper working order;
- (p) focus and picture definition shall be correct;
- (q) the ship's turning direction shall be as indicated on the rate-of-turn indicator and the zero position at dead ahead shall be correct;
- (r) the navigational radar installation shall not be sensitive to transmissions by the ship's radio equipment or to interference from other on-board sources;
- (s) the navigational radar installation or rate-of-turn indicator shall not interfere with other on-board equipment.

Furthermore, in the case of inland ECDIS equipment:

- (t) the statistical positional error affecting the chart shall not exceed 2 m;
- (u) the statistical phase angle error affecting the chart shall not exceed 1°.

#### **Article 9 Installation and performance certificate**

After successful completion of a test in accordance with Article 8, the competent authority or the approved specialist firm shall issue a certificate based on the model according to Annex 5 Section V. This certificate shall be kept permanently on board.

If the test conditions have not been met, a list of defects shall be drawn up. Any existing certificate shall be withdrawn or sent to the competent authority or the approved firm.

### **Section IV**

#### **Minimum requirements, requirements for installation and performance tests for Inland AIS equipment in inland navigation**

This part is only applicable in Zone R.

#### **Article 1 Approval of Inland AIS equipment**

Inland AIS equipment must comply with the requirements of the Test Standard, edition 2.0, to be found in the CCNR resolution 2007-I-15. Compliance is certified by an examination of type approval by a competent authority.

#### **Article 2 Installation and performance tests of shipborne Inland AIS equipment**

The following conditions are to be complied with when installing shipborne Inland AIS equipment:

1. Shipboard Inland AIS equipment can only be installed by specialist firms approved by the competent authority.
2. The Inland AIS equipment must be installed in the wheelhouse or other readily accessible location.

3. The functionality of an MKD (integrated capture and display device) must be accessible to the boatmaster. The warning and Inland AIS equipment status information must be located within the helmsman's direct field of view. Other devices used for navigation purposes may however take priority as regards their direct visibility. All warning indicator lights must remain visible after installation.

4. It must be possible to establish visually whether the equipment is operating. The equipment must be permanently supplied with electric power by means of an uninterrupted power supply circuit with its own fuse protection and connected directly to this power supply.

5. Inland AIS equipment antennas must be installed and connected to the stations so as to ensure that these stations operate reliably under all normal conditions of use. Other equipment may only be connected if the interfaces of the two equipment are compatible.

6. All that is permitted to be connected to the Inland AIS equipment are type-approved external sensors. External sensors connected to the Inland AIS equipment must be type-approved in accordance with the following maritime Standards:

<i>Sensor</i>	<i>Minimum Performance Standard (IMO)</i>	<i>ISO/IEC Standard</i>
GPS	MSC.112(73) <sup>6</sup>	IEC 61108-1 : 2003
DGPS/DGLONASS	MSC.114(73) <sup>7</sup>	IEC 61108-4 : 2004
Galileo	MSC.233(82) <sup>8</sup>	IEC 61108-3 : 2010
Heading/GPS Compass	MSC.116(73) <sup>9</sup>	ISO 22090-3 : 2004 Part 3: GNSS principles

7. Prior to post-installation commissioning, in the event of the inland navigation vessel certificate being renewed or extended and any conversion of the vessel likely to affect the conditions in which these equipment operate, a competent authority or approved specialist firm must undertake an installation check and operating test.

8. The approved specialist firm that has carried out the installation and operating test issues a certificate in accordance with Annex 5, Section VI, regarding the specific characteristics and correct operation of the Inland AIS equipment.

9. The certificate must be permanently retained onboard.

10. User instructions must be handed over for retention on board. This must be mentioned on the shipboard installation certificate.

<sup>6</sup> MSC.112(73) adopted on 1 December 2000- Revised Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment.

<sup>7</sup> MSC.114(73) adopted on 1 December 2000 - Revised Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment.

<sup>8</sup> MSC.233(82) adopted on 5 December 2006 - Performance Standards for Shipborne Galileo Receiver Equipment.

<sup>9</sup> MSC.116(73) adopted on 1 December 2000 - Performance Standards for marine transmitting heading devices (THDs).



## Section V

### Minimum requirements, requirements for installation and performance tests for tachographs in inland navigation

This part is only applicable in Zone R.

#### Article 1

#### Requirements to be complied with by tachographs

1. Ascertaining the vessel's navigation time

To determine navigation according to the criterion yes/no, the rotation of the propeller must be measured at an appropriate place. Where propulsion is other than by propeller, the vessel's movement must be ascertained in an equivalent manner at appropriate place. Where there are two or more propeller shafts, it must be ensured that recording will operate even if only one of the shafts is turning.

2. Vessel identification

The unique European vessel identification number or official vessel number must be indelibly recorded on the data medium and be readable from it.

3. Recording on the data medium

The following items of information must be recorded on the data medium such as to be tamper-proof and readable from it: the vessel's operating mode, the date and time at which the tachograph was operating and ceased operating, the insertion and removal of the data medium and other actions performed on the device. The tachograph must automatically record the time, insertion and removal of the data medium, the opening and closure of the device as well as any interruption to its power supply.

4. Recording time per day

The date and time at which the shaft starts and stops rotating must be continuously recorded daily between 00.00 and 24.00.

5. Reading the recording

The recording must be unequivocal, easy to read and clearly comprehensible. It must be possible to read the recording at any moment without any special auxiliary devices.

6. Printing the recording

It must be possible for the recordings to be provided at any time as a readily transparent printout.

7. Security of the recording

The rotation of the propeller must be recorded in a way that cannot be tampered with.

8. Accuracy of the recording

The rotation of the propeller must be recorded in a way that is accurate in time. The recording must be readable with an accuracy of 5 minutes.

9. Operating voltages

Voltage fluctuations of up to  $\pm 10\%$  of the nominal value must not hinder the proper functioning of the device. Moreover, the installation must be capable of withstanding a 25% increase in the supply voltage relative to the nominal voltage without its serviceability being impaired in any way.

10. Operating conditions

The devices or device components must operate faultlessly under the following conditions:

- ambient temperature: 0 °C to + 40 °C;
- humidity: up to 85 % relative air humidity;
- type of electrical protection: IP 54 in accordance with the International Standard IEC 529;
- oil resistance: although intended to be installed in the engine room, the devices or device components must be oil resistant;
- permissible time recording;
- tolerances:  $\pm 2$  minutes per 24 hours.

**Article 2**

**Requirements for installing shipboard tachographs**

The following conditions are to be complied with when installing shipboard tachographs:

1. Shipboard tachographs can only be installed by specialist firms approved by the competent authority.
2. The tachograph must be installed in the wheelhouse or other readily accessible location.
3. It must be possible to establish visually whether the device is operating. The device must be permanently supplied with electric power by means of an uninterrupted power supply circuit with its own fuse protection and connected directly to this power supply.
4. Information concerning the vessel's movement, namely whether the vessel is "underway" or "not underway" is derived from the movement of the propulsion system. The corresponding signal must originate from the rotation of the propeller, from the propeller shaft or from the operation of the propulsion machinery. In the case of different propulsion systems, an equivalent solution must be achieved.
5. The technical equipment for capturing the movement of the vessel must be installed so as to be as operationally reliable as possible and immune from unauthorised interventions. To this end, the signal transmission circuit (including the signal generator and device inlet terminal), from the propulsion system to the device must be protected by appropriate means with monitoring to detect any interruption of the circuit. Appropriate for this purpose are for example seals bearing identification markings and visible cable runs or monitoring circuits.
6. Upon completion of the installation, the specialist firm which has carried out or supervised the installation carries out an operating test. It issues a certificate attesting to the characteristics of the installation (in particular the location and type of seals and their markings, location and type of monitoring equipment) and that it is operating correctly; the certificate must also provide information on the type of approved device. A new operating test is required after any replacement, modification or repair; this test must be referred to on the certificate.

The certificate must at a minimum comprise the following data:

- name, address and unique reference of the approved specialist firm that has carried out or supervised the installation;

- name, address and telephone number of the competent authority that approved the company;
- unique European vessel identification number of the vessels or official number of the vessel;
- tachograph type and serial number;
- date of the operating test.

The certificate is valid for 5 years.

The purpose of the certificate is to prove that the device is approved, installed by an approved specialist firm and has been tested for correct operation.

7. The vessel's command must be trained in the use of the device by the approved company and user instructions must be handed over for retention on board. This must be mentioned on the shipboard installation certificate.

**Section VI**

**Installation and performance certificate for navigational radar installations, rate-of-turn indicators, for Inland AIS equipment and for tachographs in inland navigation**

(Model)

Vessel name/type: .....

Unique European vessel identification number: .....

**Vessel owner:**

Name: .....

Address: .....

Telephone: .....

**Navigational radar installations:**

Number:

Item No	Type	Manufacturer	Type-approval number	Serial number

**Rate-of-turn indicators:**

Number:

Item No	Type	Manufacturer	Type-approval number	Serial number

**Inland AIS equipment:**

Item No	Type	Manufacturer	Type-approval number	Serial number

**Tachographs**

...

It is hereby certified that the vessel's navigational radar installations, rate-of-turn indicators and Inland AIS equipment, referred to above, comply with the requirements of Annex 5 of the European Standard laying down technical requirements for inland navigation vessels (ES-TRIN) for the installation and performance testing of navigational radar installations, rate-of-turn indicators and Inland AIS equipment for inland navigation.

**Approved specialist firm**

Name: .....

Address: .....

Telephone: .....

Stamp Place ..... Date .....

Signature

**Competent authority for the approval of the specialist firm**

Name: .....

Address: .....

Telephone: .....

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