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Working Party on Inland Water Transport

Working Party on the Standardization of
Technical and Safety Requirements in
Inland Navigation

(Twenty-fourth session, 5-7 June 2002,
agenda item 4)

**AMENDMENT OF THE SIGNS AND SIGNALS
ON INLAND WATERWAYS (SIGNI)**

Transmitted by the Government of Ukraine

Note: Excerpts from the official version of State standard GOST 26600.98, “Signs and signals for inland waterways”, which has been received from the Government of Ukraine, are reproduced below. This standard is applied by Belarus, Kazakhstan, the Republic of Moldova, the Russian Federation and Ukraine. It was adopted on 12 November 1998 by the Inter-State Committee for Standardization, Metrology and Certification of the countries of the Commonwealth of Independent States.

SIGNS AND SIGNALS FOR INLAND WATERWAYS

General technical requirements

Introduction

The present standard has been drawn up with a view to the establishment and future use in the CIS countries of a single normative document which lays down general technical conditions, norms and technical requirements for signs and signals which are essential to ensure the safety of navigation on inland waterways.

The standard takes into account the possibility that vessels from one CIS State may use the inland waterways of another CIS State, the possibility that inland navigation may be integrated in the European inland navigation network, and participation by CIS in the single European market for transport services on inland waterways.

The norms and technical requirements laid down by the present standard will enable the best possible decisions to be taken at all stages of the construction and operation of navigational facilities on inland waterways.

The standard also takes into account the need to safeguard the continuity of the system of signs and signals which has been in use on inland waterways in previous years, and proposals from the State waterways and navigation administrations in various basins which have accumulated practical experience in the field of navigational equipment.

1. SPHERE OF APPLICATION

The present standard encompasses waterway signs and signals (referred to below as waterway signs [signs]) on the bank and on the water which are used on inland waterways.

The standard establishes the types, basic parameters, dimensions, colour and type of paint used for waterway signs, as well as the nature, colour and positioning of waterway lights.

The requirements set out in the present standard are intended for application by enterprises and groups of enterprises located on the territory of States, including unions, associations, concerns, share companies, intersectoral, regional and other associations, irrespective of their form of ownership or hierarchical status, ministries (departments) and other executive bodies.

The standard does not encompass signs and signals for waterways operated by the river administrations of certain States of which one is not a member of CIS, beacons or floating waterway signs which fall under the system devised by the International Association of Lighthouse Authorities (region A).

The standard does not cover the rules and norms for the placing of signs, or the fitting of equipment onto them, which are the responsibility of the appropriate agencies which regulate navigation on inland waterways.

The requirements set out in all the sections and in annexes A and B to the present standard are mandatory, while the requirements set out in annex C are recommended.

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3. TERMS AND DEFINITIONS

The terms and definitions in the present standard are used in accordance with State standards GOST 23903 and 26775.

4. CLASSIFICATION, GENERAL PROVISIONS

4.1 Waterway signs, in their use and installation in specific operating conditions, are divided into floating signs and signs on the bank.

4.2 In terms of the shape of the signal board, waterway signs are divided into the following types:

- Rectangular;
- Triangular;
- Round;
- Trapezoidal;
- Combined;
- Linear.

4.3 In terms of their purpose, waterway signs are divided as follows:

- Floating waterway signs: edge markings, turn signs, cross-channel current signs, bifurcation signs, centre line signs, turn/centre line signs and hazard signs;
- Waterway signs on the bank: waterway signs which indicate the position of the navigable channel and waterway signs which provide information;

(a) Waterway signs on the bank which indicate the position of the navigable channel: alignment signs, crossover signs, channel position indicators, beacons, spring signs, and also signs indicating the channel under bridges;





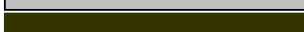
(b) Waterway signs on the bank which provide information: prohibitory signs; warning and mandatory signs; indicative signs.

4.4 In terms of the requirements relating to the operation of inland waterways, waterway signs are divided into:

- Signs with navigational lights;
- Signs without navigational lights.

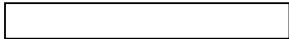








4.5 The colour of the paint of signal boards and the colour of navigational lights of signs, and also their symbols, must correspond to the indications given in table 1.

Table 1


Colour	Symbols	
	Numerical series	Colour series
White	1	
Red	2	
Green	3	
Yellow	4	
Black	5	

4.6 The nature of the navigational lights of signs and their symbols must correspond to the indications given in table 2.

Table 2

Type of light	Symbol	
	Numerical series	Graphic series
Fixed	1	 or 
Flashing (single flash)	2	
Double flash	3	
Scintillating light	4	
Group scintillating light	5	
Pulsed	6	
Interrupted pulses	7	
Single-occluding	8	

Notes:

1. The symbol for fixed lights of the type  is used when the positioning must be shown.
2. The black colour used in the symbols corresponds to a pause (eclipse), and the white to a flash of light.

4.7 Waterway lights must be point sources or linear, 360° lights or directional, depending on the type of light signal apparatus which has been installed on the sign.

5. BASIC PARAMETERS AND DIMENSIONS

5.1 Waterway signs on the bank which indicate the position of the navigable channel

5.1.1 The types, basic parameters and dimensions of signal boards for waterway signs on the bank which indicate the position of the navigable channel (referred to below as signs on the bank) must correspond to the indications given in table 3.

5.1.2. The type and colour of signal boards for signs on the bank, the colour, nature and positioning of navigational lights, depending on the difference configurations, and also the symbolic representation of the lights, must correspond to the indications given in tables 4 and 5

Table 3

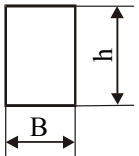
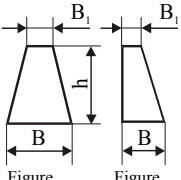
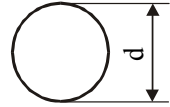
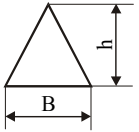
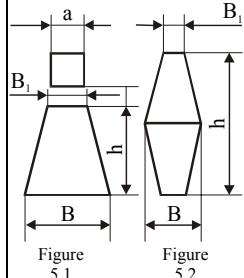
Type, type designation and shape of the signal board	Parameters and dimensions	Standard types and sizes														Maximum deviation from standard dimensions (cm)			Preferred area of application of the standard sizes
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	1-2	3-7	8-14	
1. Rectangular 	Distance of application D (km) Height h (cm) Breadth B (cm)	1.0 - 1.5	2.2 (0.9) 2.9	2.9 (1.2) 3.8	3.5 (1.4) 4.6	3.9 (1.6) 5.2	- (1.8) -	2.0 2.5	3.0 4.0	3.5 4.5	3.5 4.5	4.0 5.5	5.0 7.0	6.0 8.0	6.0 8.0				All standard sizes (with the exception of 6, 7, 10, 14) - for centre line alignment signs; 10-14 - for v-shaped alignment signs; 7, 10, 14 - for the foremost edge alignment signs; 1-5, 8, 9 - for crossover signs; 1-4 - for channel position indicators; 7, 10, 14 - for beacons; 2, 4-6 - for centre line marks in the channel under bridges; 1, 2 - for under-bridge clearance marks; 1-6 - for signs providing information.
2. Trapezoidal 	Distance of application D (km) Height h (cm) Breadth B (cm) Breadth B ₁ (cm)	- (0.5)	- (1.0)	- (1.3)	2.5 3.0	3.0 4.0	4.0 5.5	5.0 7.0	6.0 8.0	2.0 2.5	3.5 4.5	6.0 8.0							4-8 - for centre line alignment signs; 9-11 - for rearmost edge alignment signs (see fig. 2.2); 1-3 - for spring signs on the left bank; 4, 6, 8 - for beacons.
3. Round 	Distance of application D (km) Diameter d (cm)	- (0.6)	- (0.8)	- (1.0)	- (1.3)	- (1.7)													1-3 - for spring signs on the right bank; 2, 4, 5 - for centre line marks on the channel under bridges; 3-5 - for signs providing information.

Table 3 (continued)

Type, type designation and shape of the signal board	Parameters and dimensions	Standard types and sizes														Maximum deviation from standard dimensions (cm)			Preferred area of application of the standard sizes			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	1-2	3-7	8-14				
4. Triangular 	Distance of application D (km)	-	-	-																		1, 2 - for centre line marks in the channel under bridges; 1, 3 - for signs providing information.
		(0.8)	(1.0)	(1.2)																		
	Height h (cm)	-	-	-																		
	Base B (cm)	(1.0)	(1.3)	(1.6)															±10	±20		
5. Combined 	Distance of application D (km)	3.0	4.0	4.0																		1-2 - for centre line alignment signs and crossover marks; 3 - for navigational marks (see fig. 5.2)
		4.0	6.0	5.0																		
	Side of Square a (cm)	100	100																±10			
	Height h (cm)	245	430	620															±20	±30		
	Breadth B (cm)	290	420	230															±20	±20		
	Breadth B ₁ (c)	120	120	60															±10	±10		
	Distance between boards h _{alich} (cm)	60	70																±10			

Notes to tables 3-5

1. The values for the distance of application of navigational signs correspond to the values of the range of visibility of signal boards with a coefficient of transparency of the atmosphere of 0.70 per kilometre (upper figure) and 0.84 per kilometre (lower figure).

2. The values for the range of visibility of signal boards are established on the basis of the conditions in which they are observed; the values indicated in brackets, for spring signs, signs providing information and centre line marks in the channel under bridges are established on the basis of the conditions in which their shapes can be distinguished.

3. When the signs are placed against the background of the sky, the range values indicated in table 3 may be increased by a factor of 1.3.

4. The dimensions of signal boards with an area of over 25 square metres have not been established.

5. The alternatives for left-bank and right-bank lights on alignment and crossover signs, and also the alternatives for lights and signal boards for beacons, are independent of one another, and are selected on the basis of operating conditions.

6. Signal boards of beacons must have, against a dark background, three white stripes and (on the left bank) two black stripes or (on the right bank) two red stripes.

7. Over the entire length of a pontoon bridge, in addition to lights with an index of 07, white lights are installed at a height of at least 2 metres above the upper edge of the bridge for a distance of not more than 50 metres, using not less than three lights.

8. The figures set out in the tables do not dictate the manner of construction of signs and signal boards.

5.2 Waterway signs on the bank which provide information

5.2.1 Depending on their basic purpose, each group of waterway signs on the bank which provide information (referred to below as informative signs) bears a signal board with a specific shape:

- Prohibitory - round;
- Warning and mandatory - rectangular;
- Indicative - rectangular and triangular.

5.2.2 The types, basic parameters and dimensions of the signal boards of informative signs must correspond to the indications given in table 3.

5.2.3 The type and colour of the signal boards for informative signs, the colour, nature and positioning of the navigational lights, and also their symbols must correspond to the indications given in tables 1, 2 and 6 and annexes A and B.

It is recommended that images should be marked on the informative signs in accordance with annex C.

5.3 Waterway signs on the water

5.3.1 The types, basic parameters and dimensions of the part of waterway signs on the water (referred to below as floating signs) which is above the water should correspond to the indications given in table 7.

5.3.2 The type and colour of the parts of floating signs and topmarks of buoys which are above the water, and the colour, nature and positioning of navigational lights depending on the configuration, and also the symbols of lights depending on their purpose, must correspond to the indications given in tables 1, 2, 8 and 9.

5.4 Symbols of waterway signs and lights

The symbols of waterway signs and lights consist of the following:

- A short name/title;¹

¹ The short designations forming part of symbols must correspond to the abbreviations adopted in 5.1.1, 5.2.1 and 5.3.1 (for example, the informative sign).

- Two groups of digits, divided by a dash, the first of which refers to the designation of the sign, and the second to the designation of its light;
- The designation of the present standard.

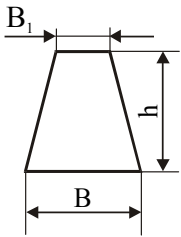
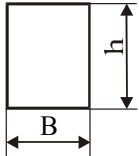
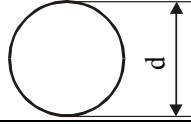
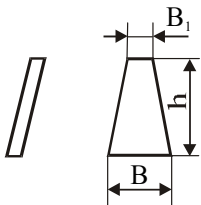
The symbol of the sign contains:

- The index of the sign (the first two digits);
- The type (the third digit) and the size of the signal board or shape (the next two digits²);
- The colour of the paint of the signal board or shape (the last two digits³).

² If the number of the standard type consists of a single digit, the digit 0 is placed before it.

³ In painting the signal board or shape, the digit 0 is placed in a single colour before its symbol. For informative signs the colour of the symbol is not indicated.

Table 7

Type, type designation (title) and shape of the part of the sign which is above water	Parameter and size	Standard types and sizes						Maximum deviations from standard sizes (cm)			Preferred area of application of the standard type
		1	2	3	4	5	6	1, 2	3, 4	5, 6	
1. Triangular 	Range of visibility in daylight D (km) Height h (cm) Breadth B (cm) Breadth B ₁ (cm)	1.0 1.5 45 50 10	1.5 2.0 55 60 15	1.8 2.5 90 100 15	2.0 3.0 125 145 30	2.5 3.5 165 150 30	3.0 4.0 285 135 35	±10 ±5 ±5	±20 ±10 ±5	±25 ±10 ±5	On rivers and canals - 1-5; On reservoirs and lakes - 5, 6
2. Rectangular 	Range of visibility in daylight D (km) Height h (cm) Breadth B (cm)	1.0 1.5 35 50	1.5 2.0 55 35	1.8 2.5 90 60	2.0 3.0 125 85	2.5 3.5 165 100	3.0 4.0 230 110	±10 ±5	±20 ±10	±25 ±10	On reservoirs and lakes - 5, 6
3. Round 	Range of visibility in daylight D (km) Diameter d (cm)	1.5 2.0 55	1.8 2.5 85	2.0 3.0 125				±5	±10		On rivers
4. Linear 	Range of visibility in daylight D (km) Height h (cm) Breadth B (cm) Breadth B ₁ (cm)	1.5 2.0 100 50 20	2.0 3.0 200 70 30	2.5 3.5 300 110 30				±20 ±5 ±5	±25 ±10 ±5		On rivers - 1 (see fig. 4.2) and sign according to figure 4.1; on reservoirs and lakes - 2, 3 (see fig. 4.2)

Notes

1. The values for ranges of visibility of waterway signs in daylight which correspond to the values of the coefficient of transparency of the atmosphere of 0.70 per kilometre (upper figure) and 0.84 per kilometre (lower figure) have been established on the basis of the conditions of observation of waterway signs.
2. The basic parameters and dimensions of the waterway sign shown in figure 4.1 (spar buoy) have not been established.
3. For signs of type 1, standard size 3, made of steel or polymer materials, it is permitted to increase the breadth B_1 to 30 cm.
4. For signs of types 1, 2 and 4, the height is given above the surface of the water.
5. The shapes indicated do not dictate the manner of construction of the parts of the signs that are above the water.
6. The dimensions of the supporting floating part, the enclosure of the light signal apparatus and other structural elements have not been established.

6 TECHNICAL REQUIREMENTS

6.1 Waterway signs must be made in accordance with the requirements of the present standard, using technical documentation approved in accordance with the established procedure.

6.2 Structural requirements

6.2.1 The structure of waterway signs must ensure:

- Uniformity of the visual impact of the shape of the signal board or mark and the signal lights in the zone of operation of the sign;
- Installation of the light signal equipment (when this is required by the conditions of operation).

6.2.2 The structure of the signs should contain provision for the following:

- In floating signs - a supporting floating part with a device which ensures that the signal shape is vertical and reduces the influence of wave action; a container (cassette) for the power source, attachment and protective devices for the light signal equipment; fender or other protective devices to protect the sign from harm caused by bumps from vessels; anchor, mooring and lifting rings, shackles, etc.;
- In signs on the bank - a support or other device which will ensure the reliable fastening of the signal board (marks) and the placing of the light signal equipment.

6.2.3 Depending on the specific conditions of operation and the place of installation, the supports and signal boards of signs on the bank must be designed for strength to resist the action of wind, snow and ice formation in accordance with the Construction Norms and Rules for the design of structures, while the bearing parts and marks on floating signs must in addition be designed for strength to resist the force and action of waves.

The strength of all components or parts of the sign must be identical and meet the requirements of the standard relating to the useful life of signs.

6.2.4 The structure of the signs must be such as to allow service at all times and access to the components of the signs and their equipment requiring painting, replacement or repair, and also access to electrical connections.

6.2.5 The values of the indicators of reliability and ease of repair of navigational signs must be stipulated in the technical documentation for signs of specific types in the light of their operating conditions.

6.2.6 Steel floating signs must be made unsinkable through the use of watertight supporting floating parts, the fitting of watertight partitions, and by filling them with light materials with a low index of water absorption (such as foam plastics) or other devices.

6.2.7 The locations of independent sources of power supply must be protected from the action of rain and water splashing.

6.2.8 In making steel structures of signs and their basic components, use should be made of steel of normal quality (standard rolled steel), while for wooden signs and their components, round softwood timber should be used in accordance with State standard 9463 or second-grade or third-grade sawn softwood timber in accordance with State standard 8486.

It is permissible to make supports from wood of other local species, provided that their resistance to rot and strength in warping tests is not inferior to the corresponding indicators for softwood timber, or from reinforced concrete.

Signal boards for signs on the bank may be manufactured from polymer materials.

The materials must be selected bearing in mind the specific types of signs and their operating conditions (area of construction).

6.2.9 Paints used to cover the surfaces of signals and the supporting structures of signs must be selected in the light of the all pertinent climatic factors in the external environment in accordance with State standard 9.104, the material being used, the properties of the surface being painted and the requirements set out in the normative documentation for paint coatings.

6.2.10 The height of signs on the bank shall be established in the light of the topography of the area.

6.2.11 The width of the stripe appearing on the boards of alignment signs must be 1/6 to 1/8 of the average width of the board. When the sign is painted with daylight fluorescent paint, the black stripe must be the widest.

6.2.12 It is permissible for the boards of alignment and crossover signs or their component parts to be installed at an angle not exceeding 30° to the vertical. In such cases the dimensions of the projection of the boards in the vertical plane must correspond to the indications given in table 3.

6.2.13 Crossover signs and beacons are generally made with two signal boards.

It is permissible to use a crossover sign which applies in one direction with one board.

6.2.14 Signal boards of channel position indicators and spring signs are generally made in the form of three-dimensional shapes, for example from intersecting half-planes.

It is permissible to use two-dimensional signs, if they meet the requirements of section 6.2.1.

6.2.15 The installation on waterway signs of transponder beacons, solar batteries or other equipment must not alter the distance of application laid down in the present standard, distort the visible recognizable shapes of the waterway signs within the distance of application laid down in the present standard, or detract from the visibility of navigational lights.

6.2.16 When an alignment sign and a crossover sign (or two alignment signs) are combined in a single sign, the signal boards of these signs shall be installed on common supports.

6.2.17 Signal boards of signs on the bank may be manufactured from separate components with gaps provided that the requirements of section 6.2.1 are met.

6.2.18 In order to reduce the wind force, it is permissible to replace the alignment stripe on alignment signs with signal boards of type 1, standard sizes 12-14 with a gap in the board. In such cases the components of the support of the sign which coincide with the projection of the gap shall be painted in the colour of the alignment stripe.

6.2.19 On informative signs, signal boards of type 1, standard size 1, 2 must be used only for signs with indexes 3.4 and 3.5; where necessary it is permissible to increase the breadth B.

6.2.20 Signal boards of informative signs must be painted as follows:

- For the group of prohibitory signs: background - white, border and diagonal stripe - red, symbol - black;

- For the group of warning and mandatory signs: background - white, border - red, symbol (digits) - black;
- For the group of indicative signs: background - white, symbol, digits or letters - black.

The border stripes of informative signs should be painted with red daylight fluorescent paint.

It is not permitted to paint the diagonal stripe of prohibitory informative signs with red daylight fluorescent paint.

6.2.21 When selecting the height of the semaphore mast (index 1.6), there must be a distance of not less than 2 metres from the lower signal mark to the surface of the ground or decking, while the distance between the signal marks must be within the range 0.4-0.8 of the height of the larger mark.

6.2.22 When it is necessary to provide additional information (establishment of a zone or time of operation of informative signs, minimum distance to which a vessel may approach a beacon, etc.), additional rectangular boards must be used, and installed below the signal board of the informative sign.

The additional board must be no broader than the signal board. The ratio between the height of the additional board and its breadth must not exceed [illegible].

6.2.23 The marking of symbols on signal boards must be carried out in accordance with annex C.

6.2.24 Captions must be placed on signal boards and additional boards in accordance with the requirements set out in State standard 10807.

6.2.25 The outline of a floating sign may be three-dimensional or flat or made of intersecting half-planes, or from separate components with gaps, provided that the requirements set out in section 6.2.1 are met.

The supporting floating part of floating signs must be such as to ensure buoyancy and stability in rated levels of wind, waves, the current and ice formation, bearing in mind the operating conditions of the signs.

6.2.27 The internal and external surfaces of steel floating signs which are accessible for painting must have a protective coating in accordance with the normative documentation. It is permissible to paint the part of the float of floating signs which is above the water black.

6.2.28 Depending on the materials of which they are made, the service life of waterway signs must be as follows:

- Floating: made of rolled steel and polymer materials - 10 years;
- Signs on land: made from rolled steel - 25 years; from polymer materials - 20 years; from timber - 10 years.

6.3 Requirements for navigational lights

6.3.1 The range of visibility of signal lights of waterway signs on the water and on the bank must be not less than the actual distance of application of these signs. An exception is the range of visibility of signal lights of alignment indicators and indicators of the dimensions of clearance under bridges, which must be no less than 4 kilometres.

6.3.2 Colour of lights: red, green and yellow - when an incandescent lamp is used, it must correspond to the requirements of the normative documents.

6.3.3 Navigational lights of all signs, apart from traffic lights, must operate in the period from sunset to sunrise, and those of traffic lights must operate around the clock.

7. SAFETY REQUIREMENTS

7.1 The operational documents for waterway signs must specify the safety requirements for the installation and operation of the signs, including the frequency of technical inspections.

7.2 Signs on the bank which are 20 metres high or over must have lightning protection. The rating of the earthing resistor must not exceed 20 ohms.

7.3 Signs on the bank which are 10 metres high or over must have a mechanism for mechanically raising equipment and materials used in operating and repairing the signs.

7.4 Waterway signs on the water and on the bank must be equipped with devices which ensure safe servicing.

7.5 Servicing of floating signs (replacement of power sources for light signal devices, repair, etc.) must be carried out from floating facilities; landing on the signs by persons is not permitted.

7.6 The electrical equipment of signs on the bank and on the water must comply with the safety requirements laid down for external electrical installations, bearing in mind the supply voltage indicated in the normative documentation.

7.7 The surface of the piers of bridges standing in the water and facing the direction of travel, and the indicators (stripes) marking the rated maximum navigable level of water, must be illuminated during the hours of darkness. All the lamps which are visible from the waterway, including those intended to illuminate the carriageway over the bridge, must be equipped with protective devices which prevent navigation from being hampered.

8. RULES CONCERNING APPROVAL⁴

8.1 In order to verify that the waterway signs correspond with the requirements of the present standard, the manufacturing enterprise must carry out acceptance testing and periodic testing.

8.2 The acceptance of the signs should be carried out in batches. Each batch covered by a quality document must include signs of one type and size. The size of the batch is stipulated in the order for the manufacture of the signs.

8.3 Each sign is subjected to acceptance tests. The testing process involves verification of whether the signs comply with the requirements set out in the present standard and in the technical documentation approved in accordance with the established procedure.

8.4 For floating waterway signs, testing is mandatory as follows:

- Comprehensive checking (every sign): basic dimensions (in accordance with section 5.3.1), external appearance, markings, type and quality of paint⁵ or primer, state of seals, bungs, manholes; watertightness (only for steel signs with supporting floating parts which are not filled with foam plastic);
- Selective checking (sample size - 5 per cent of the batch, but not less than two articles): stability,⁶ verticality of the axis of the sign when it is installed in water, strength of shackles and rings, interchangeability of removable parts, mass of the sign. For prototype signs, in addition to the above, the following are subject to checking: range of visibility in daylight, and also buoyancy, draught, list caused by the action of the current, waves and wind, and other indicators stipulated in the technical documentation for signs of a particular type or components thereof.

8.5 Acceptance of signs on the bank is carried out in accordance with State standard 13015.1 and the provision of the Construction Norms and Rules relating to acceptance of metallic, reinforced concrete and wooden structures approved in accordance with the established procedure.

8.6 Periodic testing is arranged for 5 per cent of the signs from the batch which have undergone acceptance testing, with a minimum of two, not less than once every three years, to ascertain compliance with the requirements set out in the present standard. The tests are carried out following a schedule and methodology approved in accordance with the established procedure.

⁴ These rules encompass signs and/or their components manufactured by industrial enterprises.

⁵ Painting is carried out after the acceptance testing, if it is specified in the order for the manufacture of the signs.

⁶ Except for wooden signs.

8.7 If unsatisfactory findings emerge from the acceptance testing or periodic testing, even in respect of only one of the indicators, repeat tests are carried out on twice the number of signs taken from the same batch.

If unsatisfactory results are obtained from the repeat tests, the entire batch is scrapped and acceptance of the signs is halted.

Acceptance is resumed after the causes of the defect have been identified and remedied.

...

11. INSTRUCTIONS ON THE USE AND OPERATION OF SIGNS

11.1 When selecting signs as guides to navigation on sections of waterways with identical conditions of navigation, signal boards of the same type should be used, as well as only one light among the alternatives stipulated in the present standard.

11.2 A contrasting border is used where alignment and crossover signs have different backgrounds. The width of the border must not exceed 1/15 of the average width of the board.

Against such a background, boards of type 5 (see figure 5.1, table 3) are painted in various colours - one red, the other white, depending on the background on which one board or the other is projected.

11.3 For alignment and crossover signs against the background of the sky, the signal boards must be painted black instead of red.

11.4 It is permitted to use yellow paint coatings and daylight fluorescent paint instead of white paint coatings.

11.5 Signs must be repainted at least once a year depending on the reduction (deterioration) in visibility of the colour of the paint and the symbols, digits and letters on it.

11.6 Where there are large accumulations of extraneous white lights which hamper navigation in a region where waterway signs have been installed, green and red navigational lights from among the alternatives provided for in the present standard should be used, and also pulsed lights, interrupted pulses and linear lights.

In such cases, on the rearmost signs of centre line alignments use should be made of lights with interrupted pulses, on the foremost signs pulsed or coloured linear lights, on floating edge markings - lights with interrupted pulses: white on signs on the left edge, red on signs on the right edge.

11.7 If spring and crossover signs are used simultaneously on a section, the lights of the crossover signs should be flashing white or yellow lights.

11.8 The use of white and yellow double-flashing lights on beacons is not permitted for sections of waterways where floating signs with index 06 are used.

11.9 Where signs with indexes 01-04 or part of them are used simultaneously on a section of an inland waterway, the use of an alternative with a single-flashing light on signs with indexes 02-04 is not permitted.

11.10 The lights of a sign with index 05 in channels under lift-bridges must be lit only when the structure is fully raised.

11.11 At traffic lights installed at locks, the use of the following lights is permitted: basic light - fixed light; additional light before the colour changes - flashing light.

11.12 The distances between the signal boards indicating the dimensions of clearance under bridges must be equal to the height of the signal board, and the distances between the navigational lights must be three times that height.

11.13 The indicators of the height of the clearance under a bridge and the informative sign with an index of 2.4 must signify the height of the clearance above the rated highest navigable water level (HNWL) or the maximum navigable water level.⁷

11.14 The position of the HNWL or the maximum navigable water level corresponds to the upper edge of the horizontal stripe 0.3-0.5 metres wide, which must be placed using white or fluorescent paint on bridge piers standing in the water along the navigable channel.

If the bridge piers standing in the water along the navigable channel are painted with light paint (white, grey), the stripes must be black in colour.

11.15 Informative signs must be installed in a location or on structures in such a way as to guarantee reliable visual impact of the prohibitory, mandatory and other information when boatmasters observe the signal board from any position of the vessel on the edges of the channel.

11.16 Informative signs with index 1.1 are installed 100 metres upstream and downstream from the axis of crossings and underwater structures in order to indicate a protection zone on a section of the waterway, as a rule in pairs on one or both banks.

11.17 Informative signs with an index of 2.4 are installed 100 metres upstream and downstream from a crossing over the water, as a rule one on each bank.

⁷ The clearance height is defined on the basis of the maximum navigable water level where the height H of the channel under the bridge above the HNWL in the case of a bridge of non-recent construction does not meet the requirements of river transport (i.e. where H is less than the height above water of the vessels operated in the section in question taking into account dynamic and other normative allowances).

11.18 It is permitted not to install a sign with index 2.4 by a crossing over the water if its height over the channel proper is 6 metres greater than the height above the water of the rated (tallest) vessel including the mast.

11.19 Information signs of types 1 and 3, standard sizes 4-6, and also those of type 4, standard size 3, must be used on trunk and major inland waterways.

11.20 Floating signs of types 1 and 2, standard size 1, must be used to indicate the edges of the channel as reference and basic (regulation) floating signs of large standard sizes, and also as intermediate signs together with signs in accordance with figure 4.1 (table 7).

11.21 It is permitted to use as floating signs in accordance with figure 4.1 (table 7) floats of various materials, painted red on the right-hand edge and white on the left, and also marker posts knocked into the ground.

11.22 The dimensions of the topmarks on floating signs have not been established.

The shape of the topmark on a sign with index 01 may be laid down by the bodies which regulate navigation.

11.23 Black floating edge-marking signs (index 01) are used only on lakes and reservoirs.

11.24 The outline of a wooden floating sign of type 1 with index 01, painted white to improve visibility, may be bordered by a black stripe no more than 10 centimetres wide.

11.25 Floating signs installed on basic (transit) routes must have clearly distinguishable serial (regulation) numbers. The numbering of signs starts from the mouth of the river as a rule.

Digits are placed in a contrasting colour on diametrically opposed sides of the superstructure, and, on signs in accordance with figure 4.2 (table 7), on one side.

The dimensions of the digits, depending on the standard size of the signs, should correspond to the indications given in table 10.

Table 10

Dimension	Norms for standard sizes			
	1	2	3	4, 5 and 6
Height	14	20	28	40
Breadth (apart from digit 1)	8	12	16	23
Thickness of lines	2	3	4	6
Distance between digits	4	6	8	12
Note: These norms do not cover signs of types 3 and 4.				

The size of the letter P placed on opposite sides of the superstructure of signs indicating the border of the roadstead should be one and a half times larger than the size of the digits indicated in table 10.

11.26 On signs which have no light signal equipment, light-reflecting coatings are used where necessary.

The width of the border stripe of light-reflecting coatings must be no less than [illegible] of the width of the signal board (superstructure) of the sign.

11.27 It is forbidden to install and use waterway signs without the consent of the bodies regulating navigation on inland waterways, and also other signs and lights within the limits within which they are visible from the channel, in a shape, dimensions or colour that are similar (or identical) to signs on inland waterways but have another significance.

Responsibility for the proper content and reliable operation of waterway signs, and also the equipment installed on them, is borne by the organizations and enterprises which have installed the signs in question.

Provision of light signals and other equipment on signs is determined by the bodies which regulate navigation on inland waterways, taking into account the actual conditions on each section of the waterway and the type (execution) of specific signs.

12. MANUFACTURER'S GUARANTEES

12.1 The manufacturer shall guarantee that the waterway signs meet the requirements of the present standard if the purchaser respects the conditions for transport, storage and operation laid down in the present standard.

12.2 Period of guarantee - 18 months from the day the sign is brought into operation.
