



The Traffic Signal of Inland Waterways

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Abstract. To control and regulate inland shipping traffic the use of inland waterways is needed. Signs inland voyages that are used are taken and determined based on UN ECE International provisions, which have been adapted for use in Indonesia based on a manual on inland waterway traffic signs in Indonesia in accordance with the RI Minister of Transportation Decree. NO. PM.3 / L / PHB - 77 DATE 18 MAY 1977.

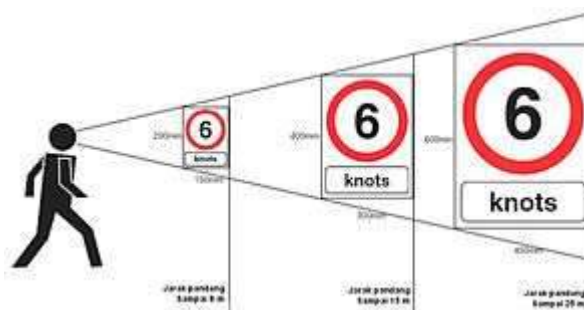
Keywords: Symbols; Ship; River and Lake.

1. Introduction

Traffic signal of Inland Waterways is a system tailored to the specific needs of any water transportation navigation management. Such as smart traffic lights, driving through the river or lake will be much smoother and stress free. Ship and boat will take preference and dispatchers will have a clear overview of the traffic. The traffic signal/Navigation on Inland Waterways is the traffic code for rivers, canals and lakes in most of countries. Such as in European countries use CEVNI for their inland waterways and in the United Kingdom, the Nordic countries, Spain, Italy and the Balkans except Croatia have their own regulations. CEVNI contains the core uniform rules applicable to the traffic on inland waterways, such as visual signs on vessels, sound signals and radiotelephony, waterway signs and markings, rules of the road, berthing rules, and prevention of pollution of water and disposal of waste.

2. Discussion

2.1 Visibility



Dimension based on distance signs

The dimension of the sign must be adjusted to the distance of sight, the further the distance of vision to a sign requires a larger dimension so that it can be read clearly. The following list shows the recommended size of the sign:

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Visibility, m	Sign height, mm	Sign width, mm
30	800	600
50	1300	1000
100	2600	1950
200	5200	3900

Medium font size can refer to the list as follows:

Distance, m	Letter / height height, mm
5	25
10	50
15	75
20	100
30	150
50	250
100	500
200	1000

Furthermore, the sign dimension used is the standard dimension as stipulated in the Decree of the Director General of Land Transportation No. HK 206/1/20 / DPRD / 93 concerning Ponds in Mainland Waters and Crossings on September 23, 1993.

2.2 Inland waters sign

Signs of inland waters are divided into 4 types:

- 1) prohibition sign
- 2) mandatory sign
- 3) warning sign
- 4) sign / guide.

1) Ban Signs

Rectangular bans, measuring 100 x 40 cm white base with a diagonal line and a red border of 10 cm thick, while the instructions are black and the numbers inside the sign are 60 cm high and 10 cm thick. Circular prohibition signs measuring 100 cm in diameter. the base color is white with a diagonal line and the edge of the circle is red with a thickness of 10 cm. Additional boards on the prohibition sign are 100 x 40 cm with white base colors and black letters and / or numbers. The following figure shows some prohibited signs that have been used in Indonesia



Do not pass and precede



Passing is prohibited for ships that are holding / pushing other ships



Do not moor on the edge of a waterway, where signs are installed

2) Signs required

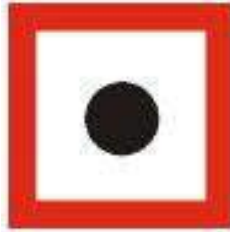
Signs must be rectangular, measure 100 x 140 cm with a diameter of 50 cm in circumference. base color. white. red edges. color manual black with a thickness of 10 ca. height of 50 cm. Signs must be in the form of a buoy, cylindrical in diameter 100 cm high 140 cm. the base color is white, the top edge and the bottom edge are red, the guide color is red with a thickness of 10 cm.



The ship continues to maintain its bow on the side / direction of the arrow with thick lines.



The ship continues to maintain its bow on the side / direction of the arrow with thick lines.



In order to issue a sound signal (whistle)

3) Warning sign

Square warning sign, size 100 x 100 cm, white base color, red border color, black hint color with a thickness of 10 cm. Rectangular warning signs, size 100 x 140 cm. white base color, red outline, black hint color with a thickness of 10 cm. Warning signs in the form of boards, size 30 x 200 cm in white, arranged vertically. Warning sign in the shape of an equilateral triangle, side length of 100 cm, white base, red border with a thickness of 10 cm.



The maximum height of the water level is limited, (the figures listed show the maximum water level, the size in meters)



In a limited groove (the numbers listed indicate the depth of water, the size in meters).

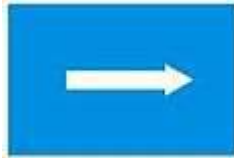


The width of waters that can be navigated is limited (the number listed shows the maximum width in meters)



4) Signposts / guides

Signs / guides in the form of a square, size 100 x 100 cm, the basic color blue color white instructions. Signs / guides for boards measuring 30 x 200 cm in white. Signs are white triangular equilateral with a side length of 100 cm.



Sail in the direction of the arrow



Crossing power lines with high pressure



It is permitted to dock on the edges in the waters where signs are installed

5) Signs Design



Example of placing signs on the Barito river, South Kalimantan

Provisions regarding signs for inland water are regulated in the technical guidelines issued by the Directorate General of Land Transportation which regulates the provisions concerning the following restrictions:

6) Sign Leaf

Sign leaf is made of aluminum plate with a minimum thickness of 2 mm or of galvanized iron plate with a minimum thickness of 2 mm. Sign leaf must be given a curve on the edge



/ side and to strengthen the frame using bolts. On the surface of the back of the leaf sign is painted black and spiked with the year of manufacture with white paint.

7) Order sign

Order signs are made of kalas wood 1 with a size of 4 x 10 cm finely chopped or of galvanized iron with a size of 40 x 40 x 4 mm. The sign frame is mounted in such a way that it is reinforced with galvanized bolts with a diameter of 6 mm.

8) Signposts

Signposts are made of grade 1 wood, measuring 10 x 10 cm and are polished on all four sides or from galvanized iron pipes with a minimum diameter of 75 mm (3 ") with a minimum thickness of 3 mm or for INP 10 galvanized profiles. Signposts made from wood using 1 (one) pillar supported with supporting poles made with 10 x 10 cm grade 1 wood mounted backwards.

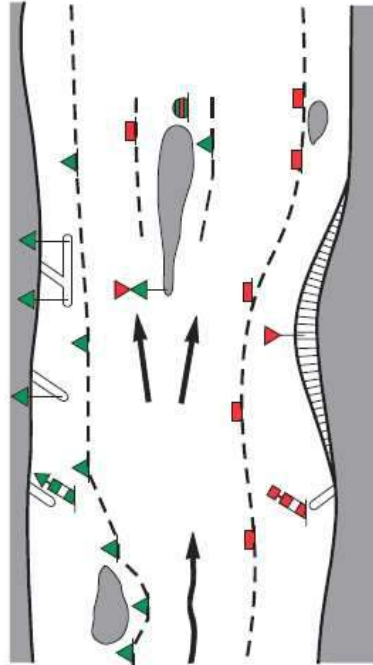
Signposts and supporting poles, flanked with wood class 1 size 2 x 5/10 cm using galvanized bolts with a diameter of 12 mm. Pole / beam joints are reinforced with 40 x 4 mm strip plates, or grade 1 x 4 x 10 cm wood and 12 mm diameter bolt nuts. The foundation of the signposts and supporting poles is made of grade 1 wood with a size of 10 x 10 cm pegged into the ground at least 175 cm from the original face of the land (MTA) or according to soil conditions. Angkur pole foundation, consisting of at least 2 pieces using 10 x 10 cm grade 1 pieces of wood that are bolted to the pile foundation by crossing. The foundation of the signposts and supporting beams is reinforced with a mortar with a size of 30 / 50–75 cm.

9) Coloring Signs

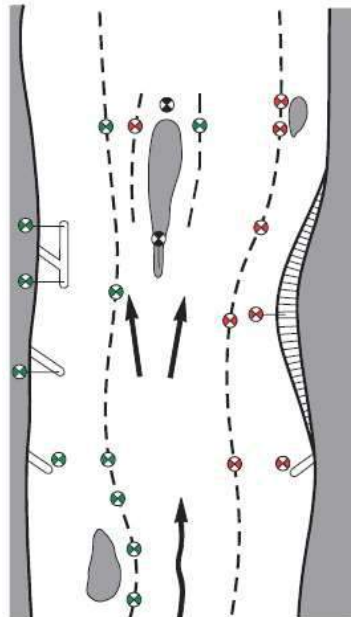
Sign dyes use reflective devices that have retroreflective properties in accordance with established standards. Placement of sheets (sheeting) on leaf signs using an applicator machine. The sign coloring process uses screen printing reflective paint. Signs of the Ministry of Transportation logo affixed to the surface in the upper left corner with a maximum diameter of 8 mm.



10) Sign placement



Example of river sign placement



Example of the placement of a river lamp ladder

11) Sign Placement Distance

Signs should be placed as close to the shipping channel as possible, to the left and / or right when the ship is moving towards the face of the sign. Sign placement must be



arranged in such a way as to pay attention to the condition of the river bank so that its existence is safe from natural disturbances. Signs must be free of leaves and / or twigs of trees or other objects that obstruct the view from any point along the groove that is a distance of up to 200 m in front of it.

12) Elevation Signs Sign Leaf

Sign leaf is installed at a height of 350 cm measured from ground level to the side of the lower leaf sign. The height of the placement of the leaf signs on the steep river bank in order to consider the maximum water level so that its presence is not submerged by water. In certain locations and conditions, signs can be placed on wood trees with a height adjusted to the applicable provisions.

13) Placement Signs prohibited

Prohibition signs are placed before the intended place or at the beginning of the section of the channel where the prohibition starts with a maximum distance of 30 m. Prohibition signs are placed on the right hand side before the place referred to by a distance of 2 m from the river bank where the signs apply. Placement of leaf signs perpendicular to the groove and can be seen clearly from a distance of 200 m

14) Mandatory Sign Placement

Signs must be placed as close as possible to where the signs apply with a maximum distance of 20 m. Mandatory buoy signs are placed at a distance of 100 m in front of the location before the entry into force of the sign.

15) Placement Warning Signs

Warning axis is placed on the right side at a distance of 100 m before the declared hazardous place or location. If an affirmation or repetition of this warning sign is needed, an additional board can be used stating Distance.

16) Placement Signs / Guides

Signs / guides are placed on the right side with a minimum distance of 100 m before the designated place or location. Directions Signs can be added with additional boards stating the distance of the location.

17) Placement of Additional Boards

Additional boards are placed under the rainbu with a distance of 10 cm from the bottom side of the leaf sign, provided that the vertical side of the additional board does not exceed the vertical side of the leaf sign. Attachment to the additional board is a maximum of 2 rows down from each other by 10 cm. The message contained in the additional board must be special. Short, clear and easy and quickly understood by groove users with 20 cm high letters, 5 cm thick and many letters a maximum of 12 letters.

18) Regional Signboard and Kilometer

Regional signage can be installed at specific locations to find out the name of the area being traversed. Kilometers are placed on the left side when the position of the view is facing downstream. Calculation of the distance of the kilometers starts from the river mouth upstream. Regional signage and kilometer mark are made with 2 mm thick



minimum aluminum plate or 2 mm thick Galvania iron plate with a size of 100 x 40 cm. The way to install / place regional signage and kilometer mark is the same as installation / placement of signs in general.



Floating signs are placed on the right



Floating signs placed on the left



Floating signs placed in the middle

2.3 Installation of Signs

1) Sign Installation Priority

The priority scale for procurement / installation of signs is based on the level of safety, security, order and smoothness of the shipping voyage in the mainland waters. The priority scale for procurement / signage is as follows:

- a. first priority, safety and passenger safety;
- b. second priority. ship safety;
- c. third priority. shipping order:
- d. fourth priority. smooth traffic.

2) Installation of Signs

Signposts and support poles are pegged into the soil to a minimum depth of 175 cm from the original face of the soil (MTA) according to soil conditions until they are really sturdy. Signposts and supporting poles are casted on the bottom with a mortar, to measure the top side of 20 x 20 cm minimum of the bottom side of 60 cm according to need. For the installation of signposts in water, you must pay attention to the strength of the base foundation by giving additional blanks from the front and / or sides so it is strong enough. For wooden sign poles, between the sign poles and supporting poles are enclosed in 2 x 5/10 cm size wood and reinforced by using a 12 mm diameter bolt nut. To attach the frame to the pole by using a galvanized bolt nut with a diameter of 12 mm.

3) Installation of Leaf Signs

In the condition of grooves that are curved to right, left, the position of the leaf is rotated clockwise from the perpendicular position to the axis of the sign + 50 (degrees) in accordance with the curvature of the groove and vice versa. The position of the leaf sign must be free from buildings, trees or other objects which cover or interfere with the view of the channel user from a minimum distance of 200 m.









4) Installation of Beacon Signs

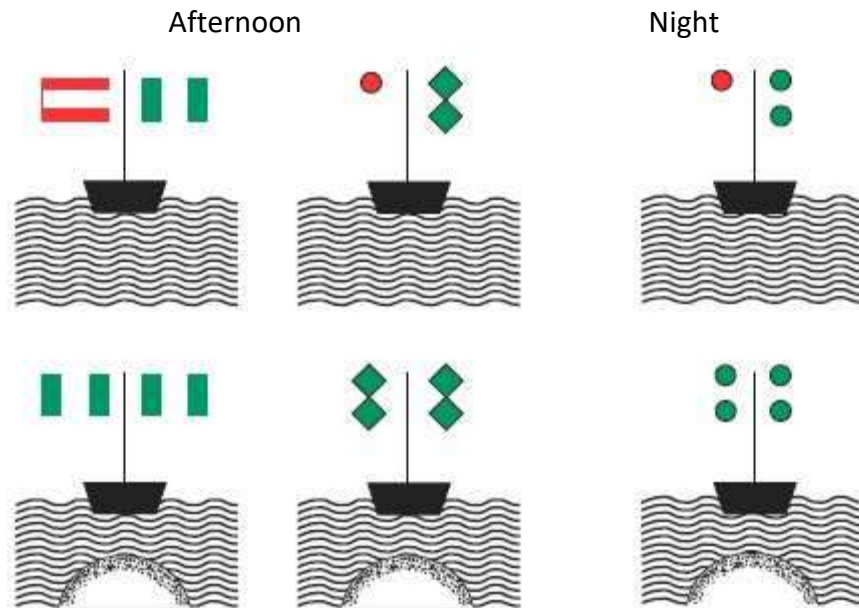
Beacon signs can be installed in the following places:

- a. meeting between the main river and tributaries;
- b. river bends with steep, winding edges;
- c. shipping lanes with high traffic frequencies
- d. certain locations according to traffic developments.

If necessary draw attention from obstacles or hazards and directions that must be followed by using the following signs:


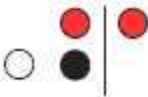
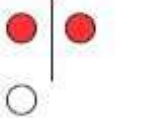
In a prohibited place			Where permitted
A red rectangle with a horizontal white line in the middle			Green rectangle with a vertical white line in the middle
Or red ball			Or two green rhombus
In the evening			
Red light			Two green lights

Examples of applications can be seen in the following figure:



If there are obstacles or hazards that require ships to avoid using the following signs:

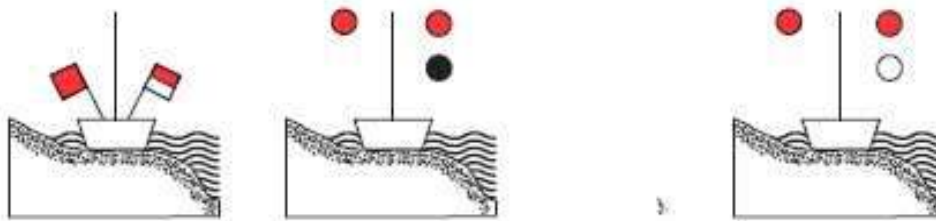


On the free groove side		On the side of the groove is not free
Red and white flag or sign		Red flag or sign
Red ball above White or black ball below		Red ball
Red light above the white light		Red light

Examples of applications can be seen in the following figure:

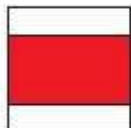
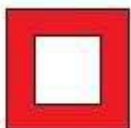


Afternoon

Night

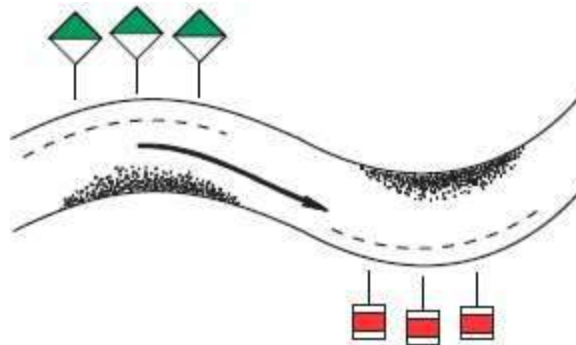


5) Sign on the river bank that shows the position of the channel

Markings on the edge of inland waters to clarify the position of the grooves

Side	Gesture	
Right		
Left		

An example application is shown below:

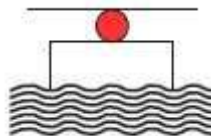


Traffic lights can be installed in places that require special traffic control.

6) Markers on fixed structures

a. Bridge

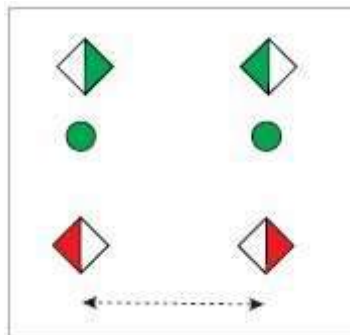
Grooves are prohibited from being passed



Suggested flow:

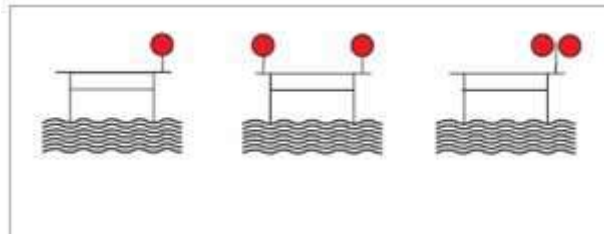


To mark the width of the path that can be navigated under the bridge, or to limit the path that can be traversed, markers are used as follows:



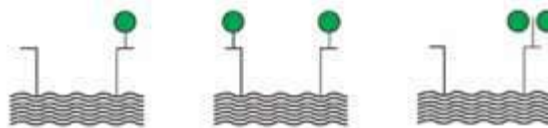
b. The bridge can move (moveable bridge)

General rules

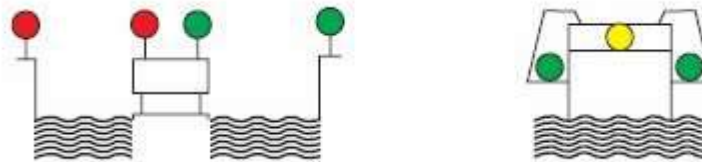


c. Open track

General rules

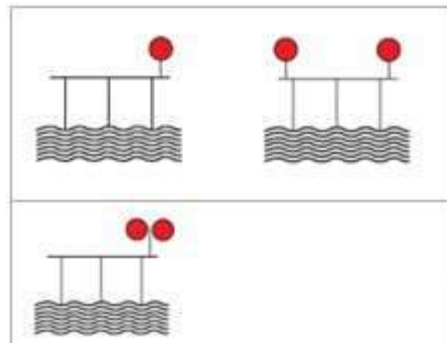


Special Rules

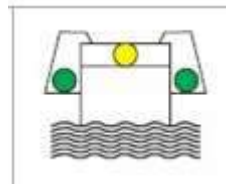
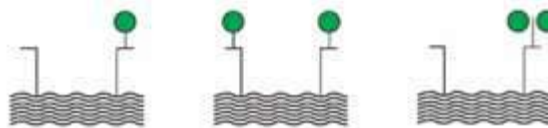


d. Ship moving pond

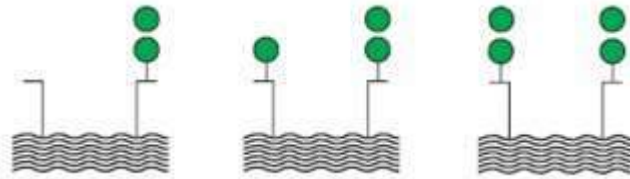
General rules



Special Rules

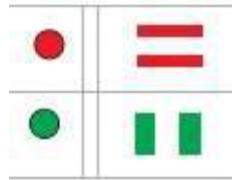


Free track: open boat transfer pond door



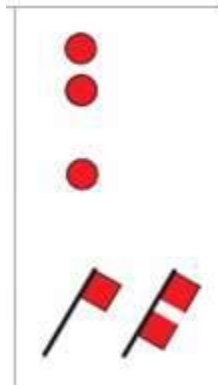
e. Closed track

The following signs can be replaced



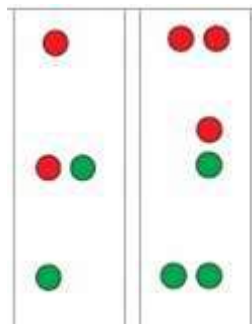
f. Navigation stopped altogether

For the sake of the safety of the voyage, it is necessary to stop the ship from using the following signs:



g. Pause

This arises on a narrow passage that needs to regulate traffic where the ship can only pass alternately.





3. Closing

Traffic signal of Inland Waterways is a navigation management system of Water Transportation which give the port and ship/boat operators understand with many symbols and signals for security and safety, include the transportation moda and passengers.

References

- [1] Association of Inland Navigation Authorities, Navigation Signs and Symbols, An industry standard for UK inland waterways, London, 2006
- [2] Decree of the Director General of Land Transportation No: HK 206/1/20 / DPRD / 93 concerning Ponds in Mainland Waters and Crossings
- [3] Litvack, Jennie and Jessica Seddon, editors, 1999, *Decentralization-Briefing Notes*, World Bank Institute.
- [4] Marbun, S.F., 1997, *Peradilan Administrasi Negara Dan Upaya Administratif Di Indonesia*, Liberty, Yogyakarta.
- [5] ----- and Moh. MahfudMD., 1987, *Pokok-Pokok Hukum Administrasi Negara*, Liberty, Yogyakarta.
- [6] Marcus Lukman, 2001, *Penerapan statistika Non Parametrik Dalam Penelitian*, Diktat Ajar Program Pascasarjana Ilmu Hukum, Surabaya.
- [7] Philipus Mandiri Hadjon, 1994, *Pengantar Hukum Administrasi Indonesia*, Gadjah Mada University Press, Yogyakarta.
- [8] Prajudi Admosudirdjo, 1981, *Hukum Administrasi Negara*, Ghalia Indonesia, Jakarta.