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Agenda item 7.3

Technical Domain / Task Number 1.5.8.1

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R0113 (O-113) The modifications to the Marking of Fixed Bridges and Other Structures over Navigable Waters

# Summary

A number of sea/river-crossing bridges have been constructed worldwide, many of which have been in operation for years. Undoubtedly, the settings and arrangements of Aids to Navigation (AtoN) for marking such a bridge are conducive to ensuring the safe passage of ships navigating nearby. In recent years, CHINA MSA has set up a series of AtoN on those bridges over navigable waters. The effectiveness of implementing these AtoN was satisfactory and the associated working experience has been further enriched. Therefore, relevant modifications are put forward in accordance with the contents of IALA R0113 (O-113).

## Purpose of document

This paper aims to propose suggestions for revising the R0113 for the ARM Committee as the reference for standardizing the specifications of AtoN marking on fixed bridges over navigable waters on the basis of practical experience in Chinese waters.

## Related document

R0113 Ed2.1 The Marking of Fixed Bridges and other Structures over Navigable Waters December 2011

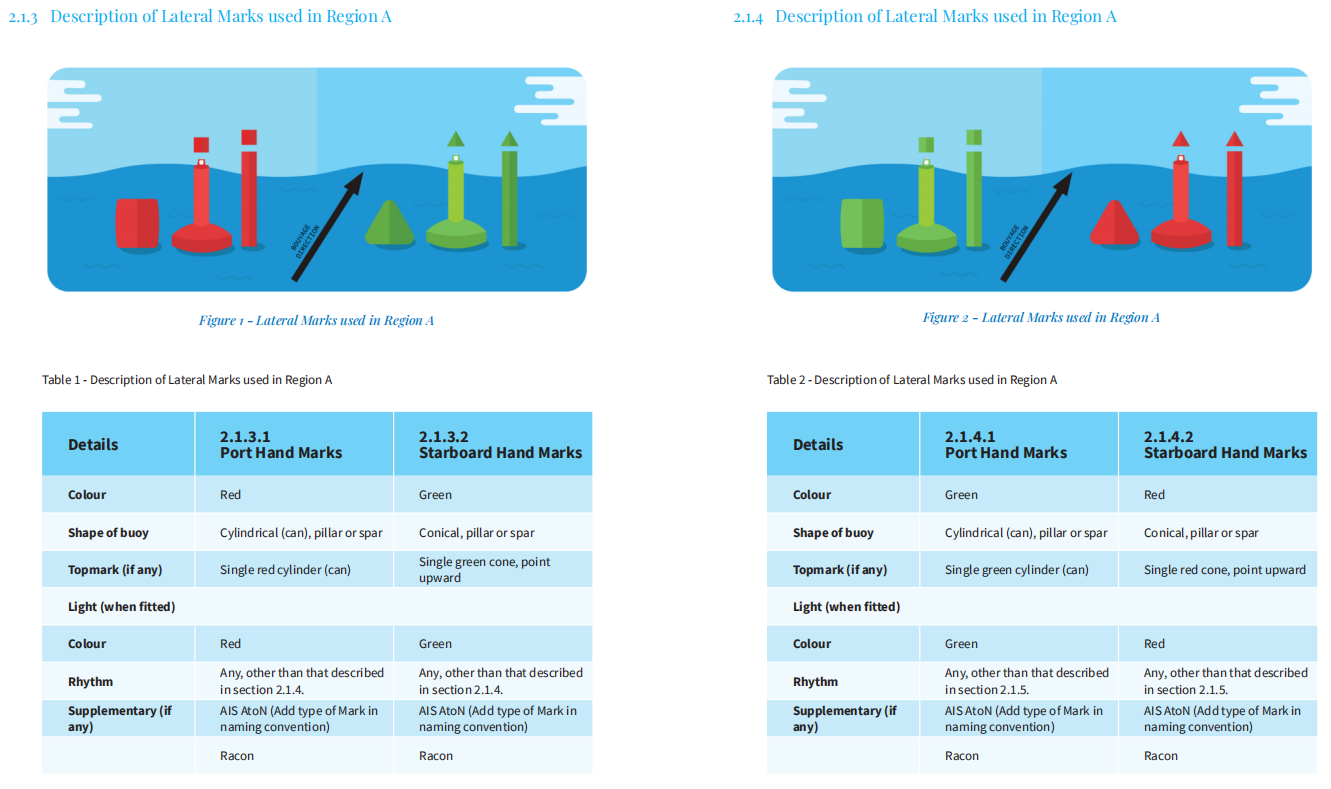
# BACKGROUND

Having recognized that the global economy, ad hoc waterborne transport, is rapidly developing since the 21st century, the sea/river-crossing bridges are widely constructed to cope with the ever-increasing traffic flow. It is of importance that key transport passages will highly reply on the sea/river-crossing bridges, the risk of colliding with the bridges is however potentially increased, particularly in the area where heavy traffic occurs. Some new challenges are thereby posed to the control of navigation, and higher standards for revising IALA R0113 should be recommended as well. In light of meeting the current development demand, it is of significance that the amendment of the proposed standards for IALA R0113 should be explicitly carried out for ensuring the safe passage of sea/river-crossing bridges.

# Discussion

It is mentioned in item 5 of IALA-R0113 (ADDITIONAL CONSIDERATIONS): " ‘No Entry’ marks, as defined by the competent authority, may be considered to inform mariners that passing under a span or one side of the span is forbidden. Bridge piers and other obstructions should be marked as determined by the Competent Authority." The relevant marks are not described in IALA-R0113. It is recommended to provide reference to the marks of "No entry" and "Pier warning".

No specific references are provided for the provisions and classification of bridge marking in 4.2.1 and 4.2.2 of IALA-R0113. It is recommended to refer to the introduction of various AtoN in Part II of IALA MBS, and add clear classification and descriptive charts of bridge marking in IALA-R0113.



IALA MBS Section 2 Description

# ProposALS

1. It is suggested that the graphic reference of the marks be added in the description of the marks of "No entry" and "Pier warning" in Part 5. “No Entry” marks, as defined by the competent authority, may be considered to inform mariners that passing under a span or one side of the span is forbidden. This is useful in helping to avoid collisions, striking and groundings.

The "No entry" mark and its characteristics are shown in Figure 1 and Table 1.

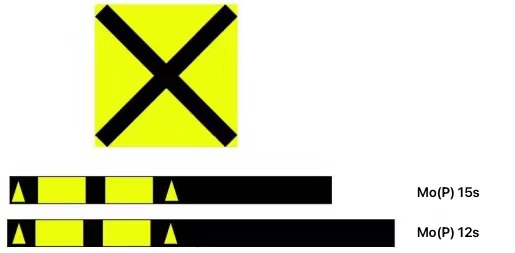


Figure 1 "No entry" mark

1. Characteristics of "No entry" mark

|  |  |  |
| --- | --- | --- |
| Marking by day | Color | Yellow background, black cross |
| Shape | Square sign, "X" shape |
| Marking by night | Color | Yellow |
| Light | Morse code “P”，period 12s or period 15s |

1. "Pier warning" marks shall be placed on the piers of navigable bridge or anti-collision facilities of piers to mark the piers or anti-collision facilities of piers, which helps to avoid ships colliding with piers.

"Pier warning" mark and its characteristics are shown in Figure 2 and Table 2.

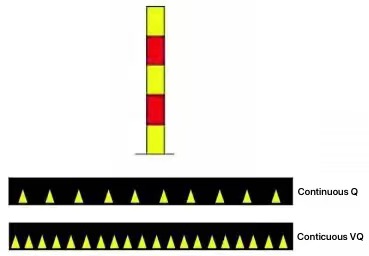


Figure 2 "Pier warning" mark

1. Characteristics of the "Pier warning" mark

|  |  |  |
| --- | --- | --- |
| Marking by day | Color | Yellow and red horizontal bands |
| Shape | Spar |
| Marking by night | Light | Continuous Q or VQ, Yellow |

1. It is recommended that the introduction of various aids to navigation in Part II of IALA MBS be referred to and descriptive charts of bridge marking be added in 4.2.

The mark of “best point of passage” for a navigable span of a fixed bridge should be placed on the overhead beam of the bridge span for indicating the position where the ships can best pass through. The marks and characteristics of the best passing point are shown in Figure 3 and Table 3.

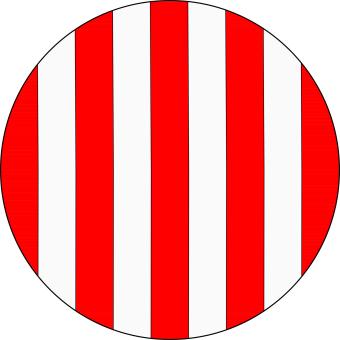


Figure 3 Best passing point of navigable bridge opening

1. Characteristics of the best passing point of navigable bridge opening

|  |  |  |
| --- | --- | --- |
| Marking by day | Color | Red and white vertical stripes |
| Shape | Circle |
| Marking by night | Light | Iso. |
| Morse code "A" |
| LFl，period 10s |

1. The port and starboard marks for a navigable span of a fixed bridge opening should be placed on the overhead beam of the bridge span for indicating the port and starboard side of the safe passage. See Figure 4 and Table 4 for marks and characteristics on the port and starboard sides for a navigable span.

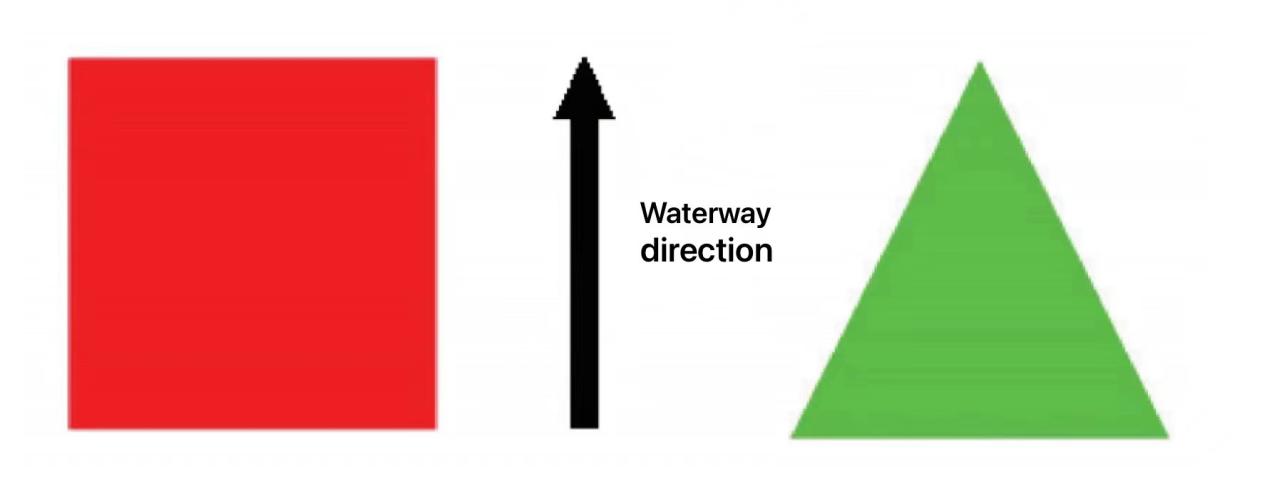


Figure 4 Port and starboard marks of the navigable bridge opening

1. Characteristics of the port and starboard marks of the navigable bridge opening

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | | Port mark of the navigable bridge opening | Starboard mark of the navigable bridge opening |
| Marking by day | Colour | Red | Green |
| Shape | Solid square | Solid equilateral triangle with apex up |
| Marking by night | Light | Any | Any |

1. It is suggested to modify the examples of bridge marking as illustrated in Part 6 of R0113.

The "no entry" mark should be placed on the overhead beam of the bridge span for indicating that ships are not allowed to enter, as shown in Figure 5.

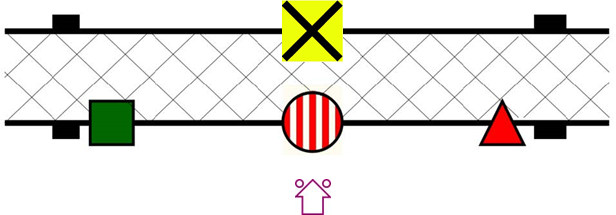


Figure 5 Unilateral navigable mark setting

"Pier warning" marks shall be placed on the piers or the anti-collision facilities of the piers at navigable bridge spans to indicate the anti-collision facilities, as shown in Figure. 6.

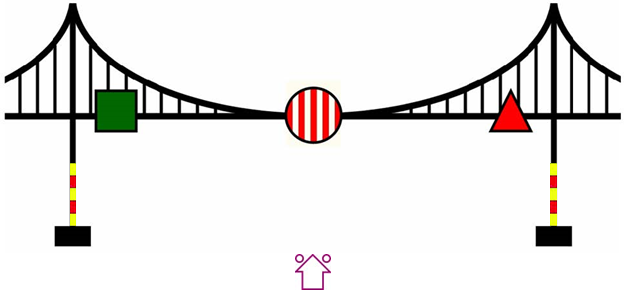


Figure 6 "Pier warning" mark setting

# example

The marking of fixed bridges for the Hong Kong-Zhuhai-Macao Bridge in China is illustrated as a case study for better understanding.



The marking of fixed bridges for the Hong Kong-Zhuhai-Macao Bridge

# References

1. R0113 (O-113) The Marking of Fixed Bridges and Other Structures over Navigable Waters

# Action requested of the Committee

The committee is invited to note the information and take actions as appropriate.