ENG5-9.21.2

Summary of Recommendation E – 106

for the NAVGUIDE



**Safety of Navigation, National Waters**

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# Introduction and background

Update of the Recommendation E – 106 commenced at ENG4 and during the work a Liaison Note (ENG4-11.1.14) was prepared for the ARM Committee.

ENG requested that ARM amend the MBS regarding Retroreflective Materials detailed in recommendation E-106.

1. Take into consideration to implement information in MBS on retroreflecting material and its placement on the buoys for guidance of illumination enhancement for the mariners.

2. Take into consideration to implement information in MBS on retroreflecting material and its placement on modified lateral marks and wreck marking buoys.

3. Take into consideration if an explanation should be presented in MBS on which countries are using the different code systems – the Standard Code or the Comprehensive Code.

The ARM Committee responded by a Liaison Note (ARM4-12.1.10) with following comments and action request:

*The proposed amendments to the MBS will be considered at the next MBS revision, which is expected to take place during the next IALA session (2018-2022).*

*A comprehensive summary of the contents of the E-106 recommendation should be added to the NAVGUIDE chapter 3, Aids to Navigation, section 3.2.4.3 “Retroreflective Materials”. This section is currently empty, in the IALA wiki it simply says “This section to be developed”. This is in an area of the NAVGUIDE under the responsibility of the ENG Committee.*

*The ARM Committee recognizes the importance of having the knowledge of the code used (Standard Code or the Comprehensive Code), but incorporation to the MBS at this time is not possible.*

**The ENG committee is requested to:**

*Add a comprehensive summary of Recommendation E-106 to the currently undeveloped section 3.2.4.3 Retroreflective Materials in the NAVGUIDE.*

Proposed summary of Recommendation E – 106 for NAVGUIDE, chapter 3, Aids to Navigation, section 3.2.4.3 “Retroreflective Materials” is available in section 2 of this document.

# Proposed summary of Recommendation E – 106 for the NAVGUIDE

Retroreflective material has a widespread use to increase the night time conspicuity. The use of retroreflecting material on aids to navigation is becoming increasingly widespread particularly in the case of unlighted aids where by the projection of a light, which may range from a hand-held spotlight to a powerful searchlight, an aid can more easily be located and sometimes identified.

Retroreflective materials are mostly used as alternative to lights on buoys on less important fairways and fairways for leisure crafts; however they also have importance on lighted fairways in case of failure of a light.

Although retroreflecting material can be of great benefit to navigation, particularly for small craft, it should be used only to enhance the efficiency of an aid to navigation and not as a substitute for a light.

Retroreflective material is available in arrays in different sizes and colours, sheeting of plastic and metal, adhesive tape etc. As with any retroreflector, sheeting glows brightly when there is a small angle between the observer's eye and the light source directed toward the sheeting, but appears non-reflective when viewed from other directions.

For Aids to Navigation purpose the retroreflective material is primary used for floating aids with a distinct code in accordance to the specific floating aid’s function.

In addition to this retroreflective material is used for day boards for leading lines, lettering and numbering, signs for waterways, marking of edges and piers etc.

Some Authorities require only a method (the Standard Code) whereby an aid can be detected with a degree of identification, especially for lateral marks. Others, such as the Scandinavian countries with complicated channels and archipelagos frequented by small craft, require a method (the Comprehensive Code) giving more detailed identification of an aid.

Administrations intending to mark aids to navigation with retroreflecting material use either the Standard Code or Comprehensive Code, as appropriate.

Administrations should not use both Codes unless the areas of use can be clearly defined.

Retroreflective material simply for detection purpose use only white material in form of letters, numbers or symbols.



Safe Water Mark, Comprehensive Code

A 1. MARITIME BUOYAGE SYSTEM, **STANDARD CODE**



A 2. MARITIME BUOYAGE SYSTEM, **COMPREHENSIVE CODE**



A 3. MARITIME BUOYAGE SYSTEM, **CODE FOR MODIFIED LATERAL MARKS AND EMERGENCY MARKS (Danish Maritime Authority, DMA)**



A 4. NOTES

1 No special code for preferred channel marks is provided, the predominant colour of the buoy only being used.

2 It may be difficult for the observer to discriminate between green and blue retroreflecting material, particularly where only one of these colours is being observed on its own. In principle, green buoys should carry only one green band, whereas blue is always used in combination with another colour, except in the case of East Cardinal marks which have two blue bands. However, this principle may be violated where one of the bands has become damaged.

3 It may be difficult for the observer to discriminate between yellow and white retroreflecting material particularly where only one of these colours is being observed on its own. Thus only one yellow band may be used on a special mark to avoid confusion with a West Cardinal mark in the comprehensive code.

4 Care should be taken that the amount of white retroreflecting material used on an aid does not detract from its daytime appearance.

5 The coefficient of retroreflection of blue and red is very much less than white or yellow, and to ensure proper recognition the following must be observed:

• Safe water marks: The red bands or stripes must be at least twice the width of the white bands or stripes.

The separation distance between the colours must be at least twice the width of the white bands or stripes.

• North and South Cardinal Marks: The blue bands must be at least twice the width of the yellow bands.

The separation distance must be at least twice the width of the yellow bands.

6 To ensure proper recognition of isolated danger marks the blue and red bands should be of equal width and separated by a distance at least equal to the width of a band.



Yellow Special Mark