IALA RECOMMENDATION

R1001

THE IALA MARITIME BUOYAGE SYSTEM

Edition 1.1

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International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime

DOCUMENT HISTORY

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16 June 2017	1st issue	Council session 64
September 2020	Edition 1.1 Editorial Corrections	

THE COUNCIL

RECALLING:

1 Article 8 of the IALA Constitution regarding the authority, duties and functions of the Council.

2 The 'Agreement on the IALA Maritime Buoyage System', signed in Paris on the 15th of April 1982 by accredited representatives of 53 nations or aids to navigation services to implement the IALA Maritime Buoyage System so initiating the harmonisation of maritime buoyage worldwide and that accredited representatives of other nations or aids to navigation services subsequently acceded to this agreement.

3 that the IALA Maritime Buoyage System described in the Agreement has been superseded by the IALA Maritime Buoyage System Second Edition published March 2010 with additional aids to navigation marks.

4 that the International Convention on Safety of Life at Sea Chapter V Regulation 13 requires Contracting Governments to take into account the Recommendations and Guidelines of IALA, including the Maritime Buoyage System (IMO SN.1/Circ.297).

RECOGNISING:

1 That the current IALA Maritime Buoyage System has been adopted by almost all marine aids to navigation authorities worldwide.

2 That the United Nations Economic Commission for Europe has issued its Resolution No. 22 on 12 November 1982 relating to signs and signals on inland waterways adopting the maritime buoyage rules of IALA into its 'SIGNI Signs and Signals for Inland Waterways'.

CONSIDERING the proposals of the Aids to Navigation Requirements and Management Committee,

ADOPTS the Maritime Buoyage System, as set out in the Annex,

RECOMMENDS that National Members and other authorities providing marine aids to navigation services implement the IALA Maritime Buoyage System,

REQUESTS the Aids to Navigation Requirements and Management Committee or such other committee as the Council may direct to keep the Recommendation under review and to propose amendments as necessary. Such amendments shall require General Assembly approval.

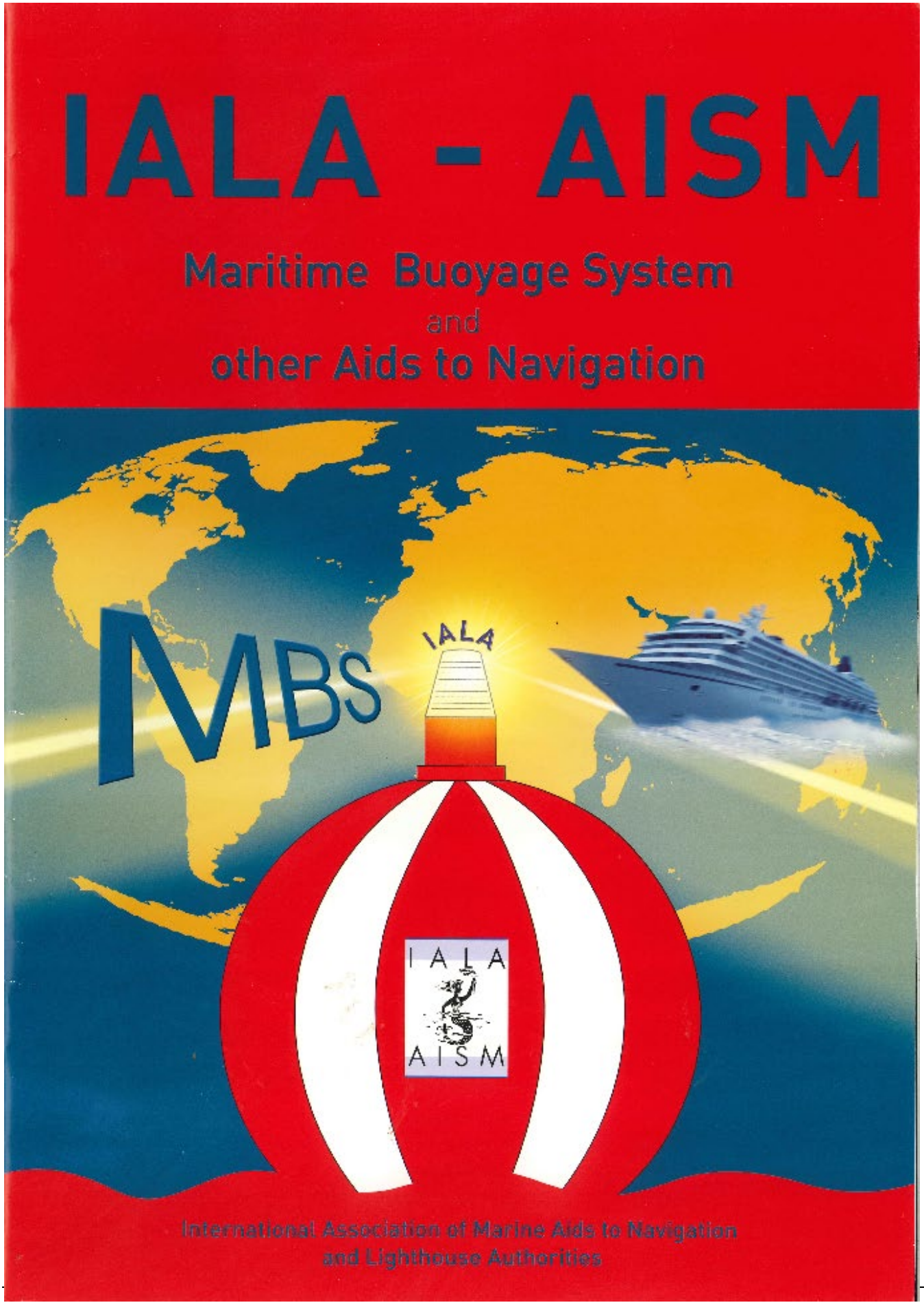
ANNEX

TO

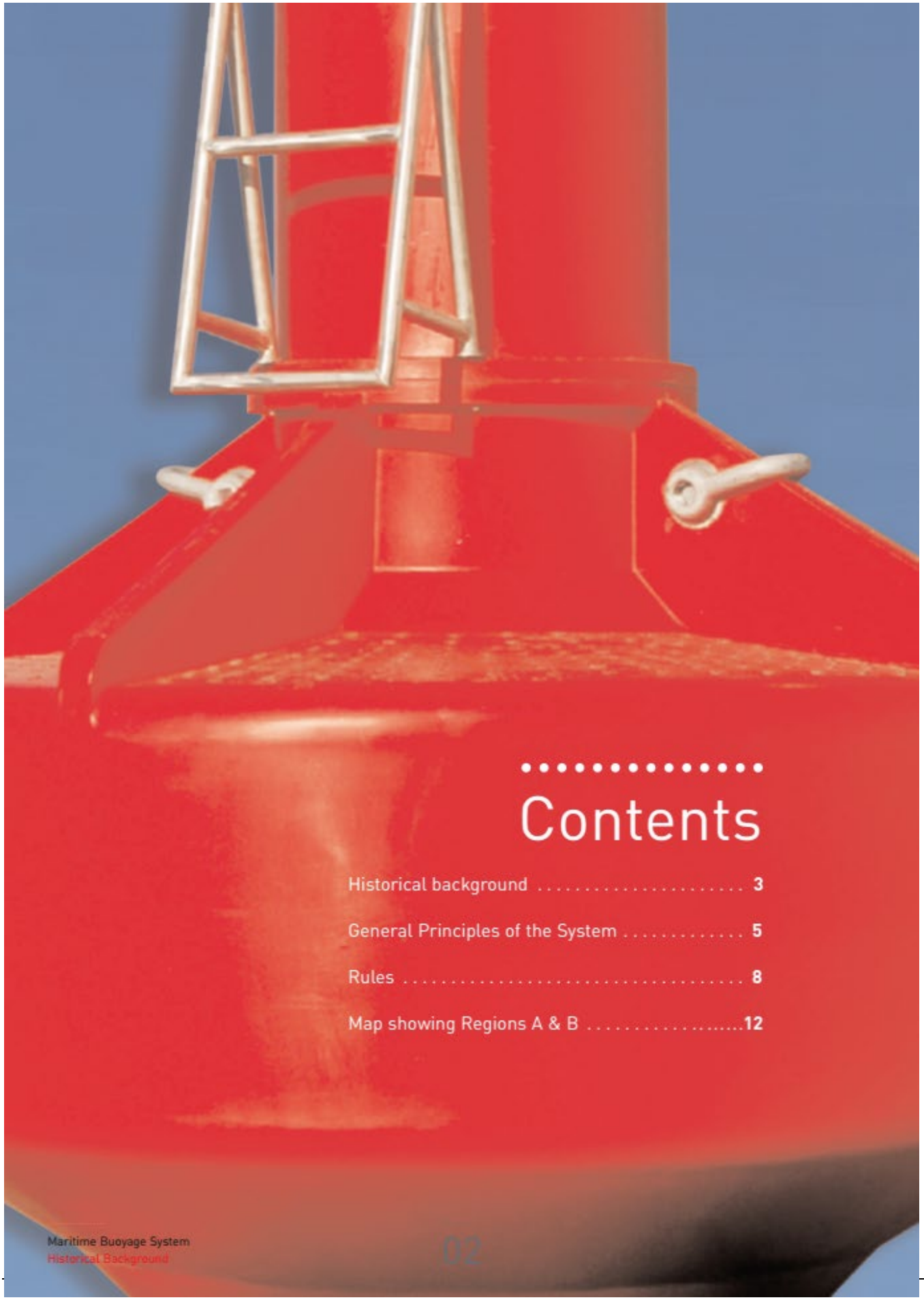
IALA RECOMMENDATION

ON

THE IALA MARITIME BUOYAGE SYSTEM


IALA - AISM
Maritime Buoyage System
and
other Aids to Navigation
MBS
IALA
I A L A
A I S M
International Association of Marine Aids to Navigation
and Lighthouse Authorities

MARITIME BUOYAGE SYSTEM
and Other Aids to Navigation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Maritime Buoyage System
Historical Background
02

MARITIME BUOYAGE SYSTEM
and Other Aids to Navigation

Historical Background

PRIOR TO 1976

There was once more than thirty different buoyage systems in use world-wide, many of these systems having rules in complete conflict with one another.

There has long been disagreement over the way in which buoy lights should be used since they first appeared towards the end of the 19th century. In particular, some countries favoured using red lights to mark the port hand side of channels and others favoured them for marking the starboard hand.

Another major difference of opinion revolved around the principles to be applied when laying out marks to assist the mariner. Most countries adopted the principle of the Lateral system whereby marks indicate the port and starboard sides of the route to be followed according to some agreed direction. However, several countries also favoured using the principle of Cardinal marks whereby dangers are marked by one or more buoys or beacons laid out in the quadrants of the compass to indicate where the danger lies in relation to the mark, this system being particularly useful in the open sea where the Lateral buoyage direction may not be apparent.

The nearest approach to international agreement on a unified system of buoyage was reached at Geneva in 1936. This Agreement, drawn up under the auspices of the League of Nations, was never ratified due to the outbreak of World War II. The Agreement proposed the use of either Cardinal marks or Lateral marks but separated them into two different systems. It provided for the use of the colour red on port hand marks and largely reserved the colour green for wreck marking.

At the end of World War II many countries found their aids to navigation destroyed and the process of restoration had to be undertaken urgently. In the absence of anything better, the Geneva rules were adopted with or without variation to suit local conditions and the equipment available. This led to wide and sometimes conflicting differences particularly in the crowded waters of North Western Europe.

In 1957 the, then, International Association of Lighthouse Authorities (IALA) was formed in order to support the goals of the technical lighthouse conferences which had been convening since 1929.

Attempts to bring complete unity had little success. Fresh impetus was given to the task of the IALA

Technical Committee, by a series of disastrous wrecks in the Dover Strait area in 1971. These wrecks, situated in one lane of a traffic separation scheme, defied all attempts to mark them in a way that could be readily understood by mariners.

There were three basic issues to address:

i) the need to retain existing equipment as far as possible to avoid undue expense
ii) the need to define how the colours green and red were to be used when marking channels
iii) the need to combine Lateral and Cardinal rules.

To meet the conflicting requirements, it was thought necessary as a first step to formulate two systems, one using the colour red to mark the port hand side of the channels and the other using the colour red to mark the starboard hand side of channels. These were called System A and System B, respectively.

The rules for System A, which included both cardinal and lateral marks, were completed in 1976 and agreed by the International Maritime Organization (IMO). The System was introduced in 1977 and its use has gradually spread throughout Europe, Australia, New Zealand, Africa, the Gulf and some Asian Countries.

FROM 1980

The rules for System B were completed in early 1980. These were considered to be suitable for application in North, Central and South America, Japan, Republic of Korea and Philippines.

The rules for the two Systems were so similar that the IALA Executive Committee was able to combine the two sets of rules into one, known as "The IALA Maritime Buoyage System". This single set of rules allows Lighthouse Authorities the choice of using red to port or red to starboard, on a regional basis; the two regions being known as Region A and Region B.

At a Conference convened by IALA in November 1980 with the assistance of IMO and the International Hydrographic Organization (IHO), Lighthouse Authorities from 50 countries and the representatives of nine International Organisations concerned with aids to navigation met and agreed to adopt the rules of the new combined System. The boundaries of the buoyage regions were also decided and illustrated on a map annexed to the rules. The Conference underlined the need for cooperation between neighbouring countries and with Hydrographic Services in the introduction of the new System.

FROM 2010

Although the maritime buoyage system (MBS) has served the maritime community well since its inception in the 1970s, after the 2006 IALA Conference in Shanghai, China, it was decided to review the system in light of changes in the navigation environment and the further development of electronic aids to navigation.

Worldwide consultation revealed that the fundamental principles of the MBS should be retained. However, due to changes in navigation practices and patterns, as well as innovations and technological developments, some enhancements to the MBS were needed.

Ideally, a unified marking arrangement would, in principle, be desirable for Regions A and B. All IALA Members view this change as impractical, detrimental to safety, and probably unachievable. However, with the aim of improving navigational safety, advances towards a global unified system can be achieved through adoption of common characteristics, such as consistent lighting rhythms, on port and starboard hand marks regardless of region.

The most significant changes in the 2010 revision are the inclusion of aids to navigation used for marking recommended by IALA that are additional to the floating buoyage system previously included. This is aimed at providing a more complete description of aids to navigation that may be used. It includes the Emergency Wreck Marking Buoy, descriptions of other aids to navigation specifically excluded from the original MBS, and the integration of electronic marks via radio transmission. With regards to aids to navigation, the changes provided by this revision will allow the emerging e-Navigation concept to be based upon the marks provided by this booklet.

Thus, the IALA Maritime Buoyage System will continue to help all Mariners, navigating anywhere in the world, to fix their position and avoid dangers without fear of ambiguity, now and for the years to come.

Continuity and harmonization of Aids to Navigation Marking is to be encouraged by all competent maritime authorities.

General principles of the System

The responsibility for safe navigation resides with the mariner, through the appropriate use of aids to navigation in conjunction with official nautical documents and prudent seamanship, including voyage planning as defined in IMO Resolutions. This booklet provides guidance on the Maritime Buoyage System and other aids to navigation for all users.

The IALA Aids to Navigation system has two components: The Maritime Buoyage System and other aids to navigation comprised of fixed and floating devices. This is primarily a physical system, however all of the marks may be complemented by electronic means.

Within the Maritime Buoyage System there are six types of marks, which may be used alone or in combination. The mariner can distinguish between these marks by identifiable characteristics. Lateral marks differ between Buoyage Regions A and B, as described below, whereas the other five types of marks are common to both regions.

These marks are described below:

LATERAL MARKS

Following the sense of a 'conventional direction of buoyage', lateral marks in Region A utilize red and green colours (refer to section 2.4) by day and night to denote the port and starboard sides of channels respectively. However, in Region B (refer to section 2.5) these colours are reversed with red to starboard and green to port.

A modified lateral mark may be used at the point where a channel divides to distinguish the preferred channel, that is to say the primary route or channel that is so designated by the competent authority.

CARDINAL MARKS

Cardinal marks indicate that the deepest water in the area lies to the named side of the mark. This convention is necessary even though for example, a North mark may have navigable water not only to the North but also East and West of it. The mariner will know it is safe to the North, but shall consult the chart for further guidance.

Cardinal marks do not have a distinctive shape but are normally pillar or spar. They are always painted in yellow and black horizontal bands and their distinctive double cone top-marks are always black.

Cardinal Marks (continued)

An aide-memoire to their colouring is provided by regarding the top-marks as pointers to the positions of the black band(s):

- **North:**
  Top-marks pointing upward:
  black band above yellow band;
- **South:**
  Top-marks pointing downward:
  black band below yellow band;
- **East:**
  Top-marks pointing away from each other:
  black bands above and below a yellow band;
- **West:**
  Top-marks pointing towards each other:
  black band with yellow bands above and below.

Cardinal marks also have a special system of flashing white lights. The rhythms are basically all "**very quick**" (VQ) or "**quick**" (Q) flashing but broken into varying lengths of the flashing phase. "**Very quick flashing**" is defined as a light flashing at a rate of either 120 or 100 flashes per minute, "**quick flashing**" is a light flashing at either 60 or 50 flashes per minute.

The characters used for Cardinal marks will be seen to be as follows:

- **North:**
  Continuous very quick flashing or quick flashing;
- **East:**
  Three **"very quick"** or **"quick"** flashes followed by darkness;
- **South:**
  Six **"very quick"** or **"quick"** flashes followed immediately by a long flash, then darkness;
- **West:**
  Nine **"very quick"** or **"quick"** flashes followed by darkness.

The concept of three, six, nine is easily remembered when one associates it with a clock face. The long flash, defined as a light appearance of not less than 2 seconds, is merely a device to ensure that three or nine **"very quick"** or **"quick"** flashes cannot be mistaken for six.

It will be observed that two other marks use white lights; Isolated Danger marks and Safe Water marks. Each has a distinctive light rhythm that cannot be confused with the very quick or quick flashing light of the Cardinal marks.

ISOLATED DANGER MARK

The Isolated Danger mark is placed on, or near to a danger that has navigable water all around it. Because the extent of the danger and the safe passing distance cannot be specified for all circumstances in which this mark may be used, the mariner shall consult the chart and nautical publications for guidance. Distinctive double black spherical top-marks and Group flashing (2) white lights, serve to distinguish Isolated Danger marks from Cardinal marks.

SAFE WATER MARKS

The Safe Water mark has navigable water all around it, but does not mark a danger. Safe Water marks can be used, for example, as fairway, mid-channel or landfall marks.

Safe Water marks have an appearance different from danger marking buoys. They are spherical, or alternatively pillar or spar with red and white vertical stripes and a single red spherical top-mark. Their lights, if any, are white using isophase, occulting, one long flash or Morse **"A"** (•-) rhythms.

SPECIAL MARKS

Special marks are used to indicate a special area or feature whose nature may be apparent from reference to a chart or other nautical publication. They are not generally intended to mark channels or obstructions where the MBS provides suitable alternatives.

Special marks are yellow. They may carry a yellow **"X"** top-mark, and any light used is also yellow. To avoid the possibility of confusion between yellow and white in poor visibility, the yellow lights of Special marks do not have any of the rhythms used for white lights.

Their shape will not conflict with that of navigational marks. This means, for example, that a special buoy located on the port hand side of a channel may be cylindrical but will not be conical. Special marks may be lettered or numbered, and may also include the use of a pictogram to indicate their purpose using the IHO symbology where appropriate.

MARKING NEW DANGERS

"New Dangers" are newly discovered hazards, natural or man-made, that may not yet be shown in nautical documents and publications, and until the information is sufficiently promulgated, should be indicated by:

- marking a new danger using appropriate marks such as; Lateral, Cardinal, Isolated Danger marks, or equally
- using the Emergency Wreck Marking Buoy (EWMB)

If the competent authority considers the risk to navigation to be especially high at least one of the marks should be duplicated.

The Emergency Wreck Marking Buoy has blue and yellow vertical stripes in equal number, with a vertical/perpendicular yellow cross top-mark, and displays a blue and yellow alternating light.

Marking of a new danger may include use of a Racon coded Morse **"D"** (-••) or other radio transmitting device such as automatic identification systems as an Aid to Navigation (AIS as an AtoN).

Marking of a new danger may be discontinued when the appropriate competent Authority is satisfied that information concerning the **"New Danger"** has been sufficiently promulgated or the danger has been resolved.

OTHER MARKS

Other Marks include lighthouses, beacons, sector lights, leading lines, major floating aids, and auxiliary marks. These visual marks are intended to aid navigation as information to mariners, not necessarily regarding channel limits or obstructions.

- Lighthouses, beacons and other aids of lesser ranges are fixed aids to navigation that may display different colours and/or rhythms over designated arcs. Beacons may also be unlighted.
- Sector lights display different colours and/or rhythms over designated arcs.

  The colour of the light provides directional information to the mariner.
- Leading lines / Ranges allow ships to be guided with precision along a portion of a straight route using the alignment of fixed lights (leading lights) or marks (leading marks), in some cases a single directional light may used.
- Major floating aids include lightvessels, light floats and large navigational buoys intended to mark approaches from off shore.
- Auxiliary Marks are those other marks used to assist navigation or provide information. These include aids of non-lateral significance that are usually of defined channels and otherwise do not indicate the port and starboard sides of the route to be followed as well as those used to convey information for navigational safety.
- Port or Harbour Marks such as breakwater, quay/jetty lights, traffic signals, bridge marking and inland waterways aids to navigation (further described in section 8.7).

SOLAS CHAPTER V,
Regulation 13 – Consolidated edition 2004

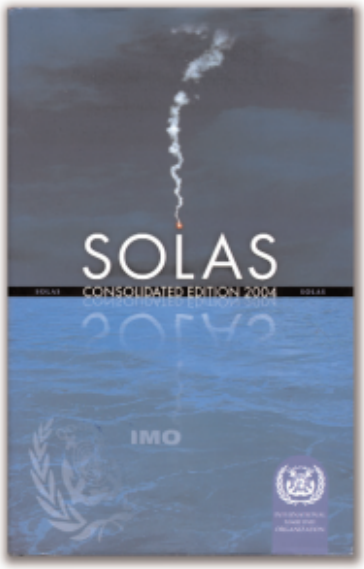
Establishment and operation of aids to navigation

1. Each Contracting Government undertakes to provide, as it deems practical and necessary, either individually or in co-operation with other Contracting Governments, such aids to navigation as the volume of traffic justifies and the degree of risk requires.

2. In order to obtain the greatest possible uniformity in aids to navigation, Contracting Governments undertake to take into account the international recommendations and guidelines* when establishing such aids.

3. Contracting Governments undertake to arrange for information relating to aids to navigation to be made available to all concerned. Changes in the transmissions of position-fixing systems which could adversely affect the performance of receivers fitted in ships shall be avoided as far as possible and only be effected after timely and adequate notice has been promulgated.

* *Refer to the appropriate Recommendations and guidelines of IALA and to SN/Circ.107, Maritime Buoyage System.*



RULES

1. GENERAL

1.1 Scope

The Maritime Buoyage System and other aids to navigation provide rules that apply to all fixed, floating and electronic marks serving to indicate:

1.1.1 The lateral limits of navigable channels.

1.1.2 Natural dangers and other obstructions such as wrecks.

1.1.3 Landfall, course to steer, and other areas or features of importance to the mariner.

1.1.4 New dangers.

1.2 Types of marks

A Mark is defined as a signal available to the Mariner to convey guidance in safe navigation. The Maritime Buoyage System and other aids to navigation provide the following types of marks that may be used in combination:

1.2.1 Lateral marks, used in conjunction with a **"conventional direction of buoyage"**, generally employed for well defined channels. These marks indicate the port and starboard sides of the route to be followed. Where a channel divides, a modified lateral mark may be used to indicate the preferred route. Lateral marks differ between Buoyage Regions A and B as described in MBS Sections 2 and 8.

1.2.2 Cardinal marks, used in conjunction with the mariner's compass, to indicate where the mariner may find navigable water.

1.2.3 Isolated Danger marks to indicate isolated dangers of limited size that have navigable water all around them.

1.2.4 Safe Water marks to indicate that there is navigable water all around their position, e.g. mid-channel marks.

1.2.5 Special marks to indicate an area or feature referred to in nautical documents, not generally intended to mark channels or obstructions.

1.2.6 Other marks used to provide information to assist navigation.

1.3 Method of characterising marks

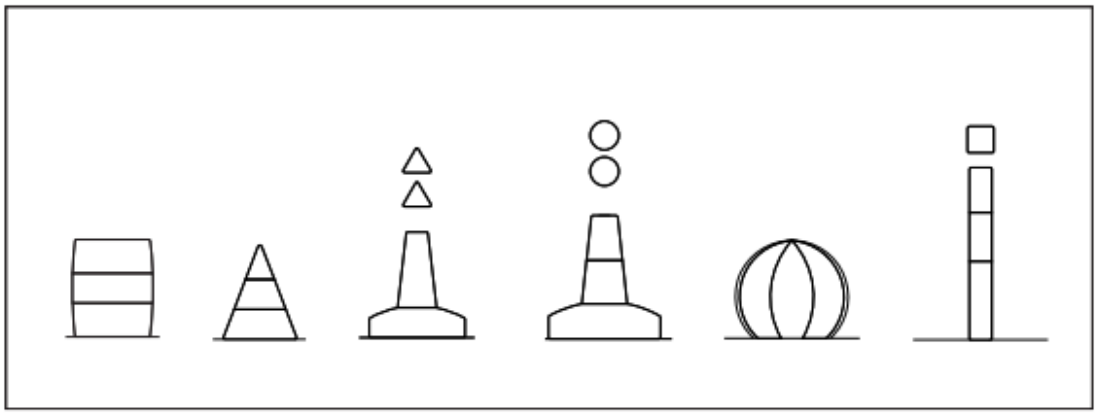
The significance of the mark depends upon one or more of the following features:

1.3.1 By night, colour and rhythm of light and/or illumination enhancement.

1.3.2 By day, colour, shape, top-mark, and/or light (including colour and rhythm).

1.3.3 By electronic (digital) symbology, e.g. as a complement to physical marks.

1.3.4 By electronic (digital) symbology solely.



2. LATERAL MARKS

2.1 Definition of 'conventional direction of buoyage'

The 'conventional direction of buoyage', which must be indicated in appropriate nautical charts and documents, may be either:

2.1.1 The general direction taken by the mariner when approaching a harbour, river, estuary or other waterway from seaward, or

2.1.2 The direction determined by the proper authority in consultation, where appropriate, with neighbouring countries. In principle, it should follow a clockwise direction around land masses.

2.2 Buoyage Regions

2.2.1 There are two international Buoyage Regions A and B, where lateral marks differ. The current geographical divisions of these two Regions are shown on the world map on the centrefold of this booklet.

2.3 General Rules for Lateral Marks

2.3.1 Colour

The colour of lateral marks must comply with the IALA MBS Regions as specified in Sections 2.4 and 2.5.

2.3.2 Shapes

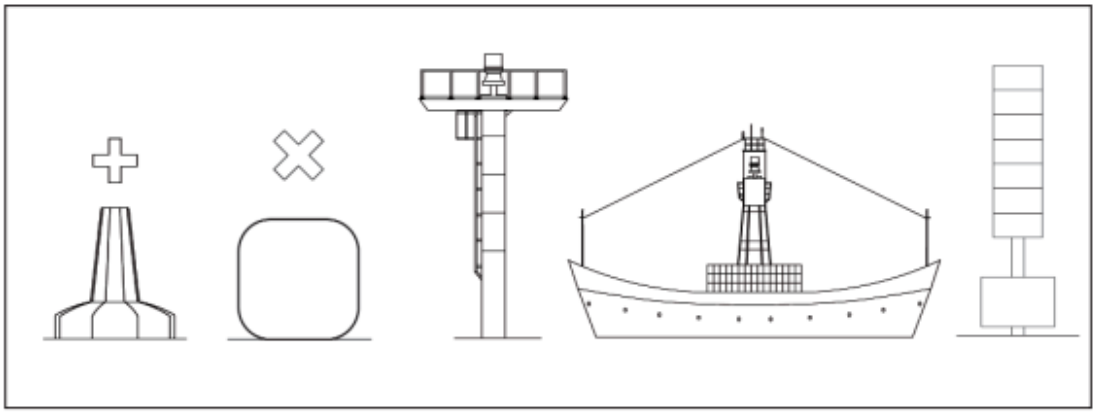
Lateral marks should be of cylindrical and conical shape. However, where they do not rely on a distinctive shape for identification, they should, where practicable, carry the appropriate topmark.

2.3.3 Numbering or lettering

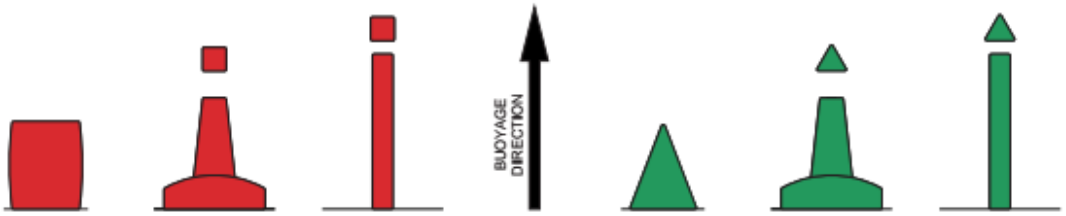
If marks at the sides of a channel are numbered or lettered, the numbering or lettering shall follow the 'conventional direction of buoyage' i.e. numbered from seaward. The protocol for numbering lateral marks, especially in confined waterways, should be 'even numbers on red ~ odd numbers on green'.

2.3.4 Synchronisation

If appropriate, synchronised lights (all flash at the same time) or sequential lights (flash one after another) or a combination of both may be utilized.

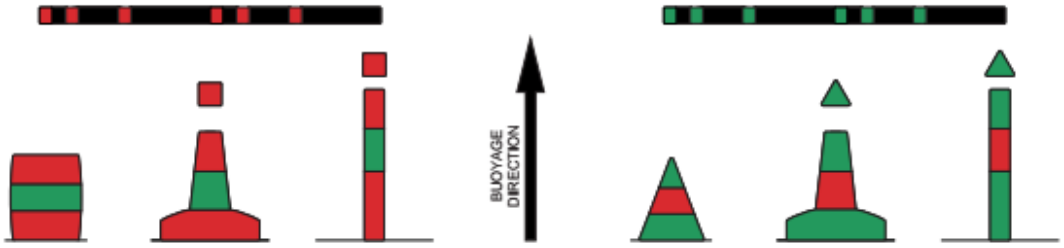


2.4 Description of Lateral Marks used in Region A



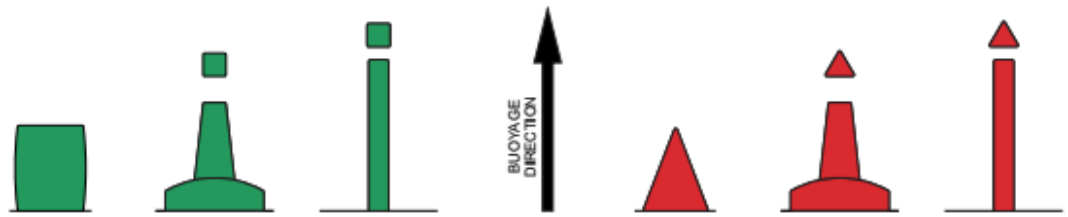
	2.4.1 Port hand Marks	2.4.2 Starboard hand Marks
Colour	Red	Green
Shape of buoy	Cylindrical (can), pillar or spar	Conical, pillar or spar
Topmark (if any)	Single red cylinder (can)	Single green cone, point upward
Light (when fitted)		
Colour	Red	Green
Rhythm	Any, other than that described in section 2.4.3.	Any, other than that described in section 2.4.3.

2.4.3 At the point where a channel divides, when proceeding in the "conventional direction of buoyage," a preferred channel may be indicated by a modified Port or Starboard lateral mark as follows:



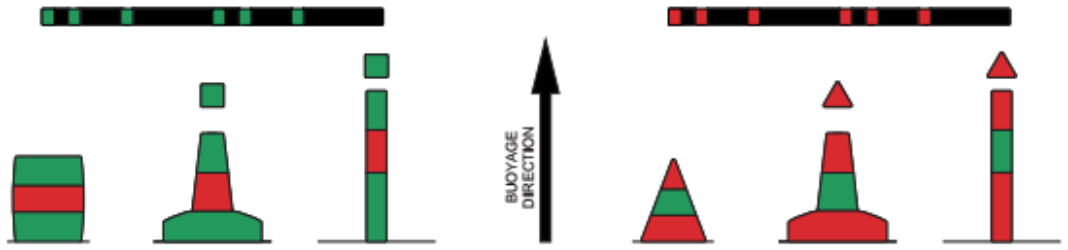
	2.4.3.1 Preferred channel to Starboard	2.4.3.2 Preferred channel to Port
Colour	Red with one broad green horizontal band	Green with one broad red horizontal band
Shape of buoy	Cylindrical (can), pillar or spar	Conical, pillar or spar
Topmark (if any)	Single red cylinder (can)	Single green cone, point upward
Light (when fitted)		
Colour	Red	Green
Rhythm	Composite group flashing (2 + 1)	Composite group flashing (2 + 1)

2.5 Description of Lateral Marks used in Region B

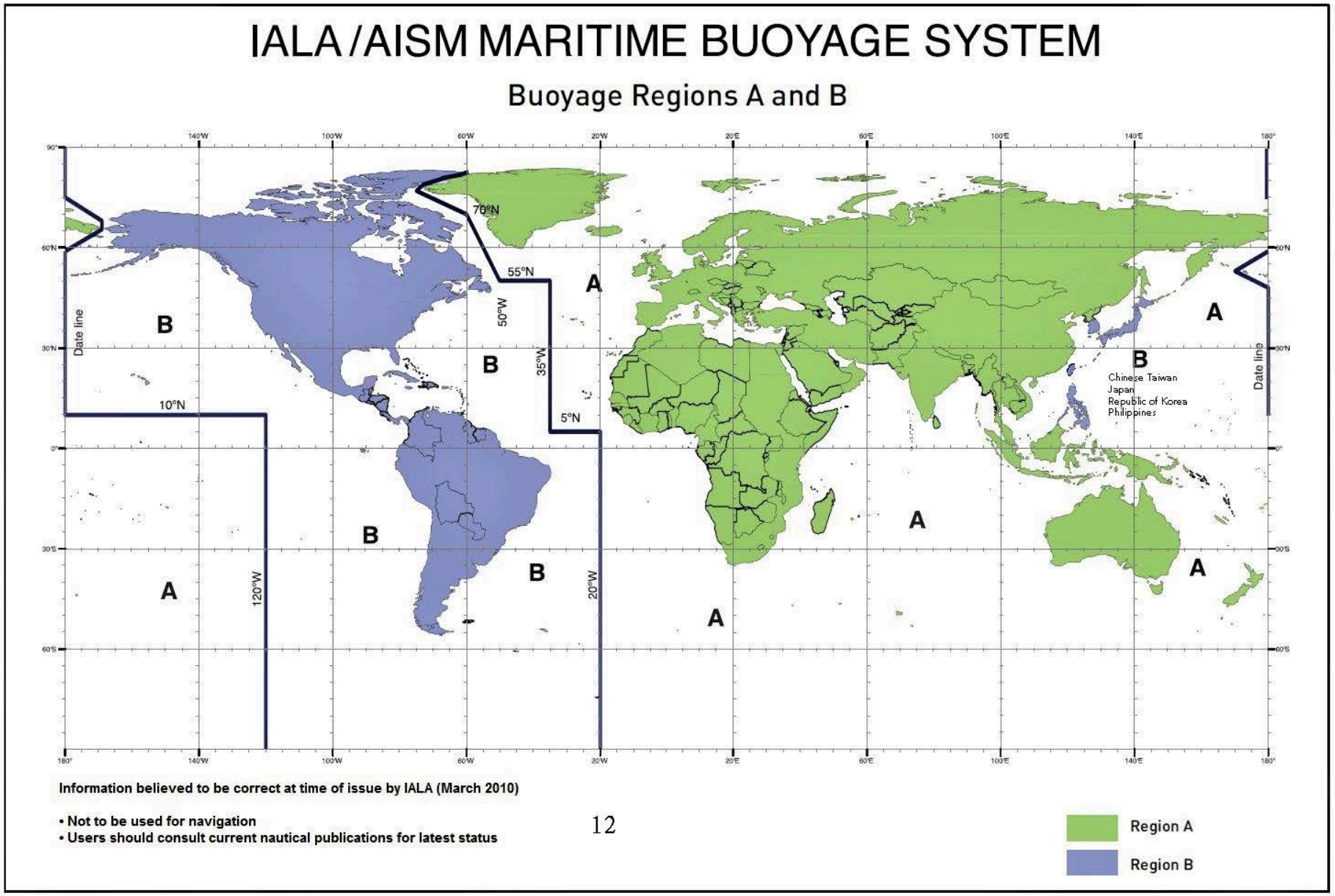


	2.5.1 Port hand Marks	2.5.2 Starboard hand Marks
Colour	Green	Red
Shape of buoy	Cylindrical (can), pillar or spar	Conical, pillar or spar
Topmark (if any)	Single green cylinder (can)	Single red cone, point upward
Light (when fitted)		
Colour	Green	Red
Rhythm	Any, other than that described in section 2.5.3.	Any, other than that described In section 2.5.3.

2.5.3 At the point where a channel divides, when proceeding in the "conventional direction of buoyage," a preferred channel may be indicated by a modified Port or Starboard lateral mark as follows:



	2.5.3.1 Preferred channel to Starboard	2.5.3.2 Preferred channel to Port
Colour	Green with one broad red horizontal band	Red with one broad green horizontal band
Shape of buoy	Cylindrical (can), pillar or spar	Conical, pillar or spar
Topmark (if any)	Single green cylinder (can)	Single red cone, point upward
Light (when fitted)		
Colour	Green	Red
Rhythm	Composite group flashing (2 + 1)	Composite group flashing (2 + 1)


IALA /AISM MARITIME BUOYAGE SYSTEM
Buoyage Regions A and B
70°N
55°N
50°W
35°W
5°N
10°N
120°W
20°W
Date line
Date line
A
B
Chinese Taiwan
Japan
Republic of Korea
Philippines
Information believed to be correct at time of issue by IALA (March 2010)
• Not to be used for navigation
• Users should consult current nautical publications for latest status
12
Region A
Region B

3. CARDINAL MARKS

3.1 Definition of Cardinal quadrants and marks

The four quadrants (North, East, South and West) are bounded by the true bearings NW-NE, NE-SE, SE-SW, and SW-NW, taken from the point of interest.

3.1.1 A Cardinal mark is named after the quadrant in which it is placed

3.1.2 The name of a Cardinal mark indicates that it should be passed to the named side of the mark.

3.1.3 The Cardinal marks in Region A and Region B, and their use, are the same.

3.2 Use of Cardinal Marks

A Cardinal mark may be used, for example:

3.2.1 To indicate that the deepest water in that area is on the named side of the mark.

3.2.2 To indicate the safe side on which to pass a danger.

3.2.3 To draw attention to a feature in a channel such as a bend, a junction, a bifurcation or the end of a shoal.

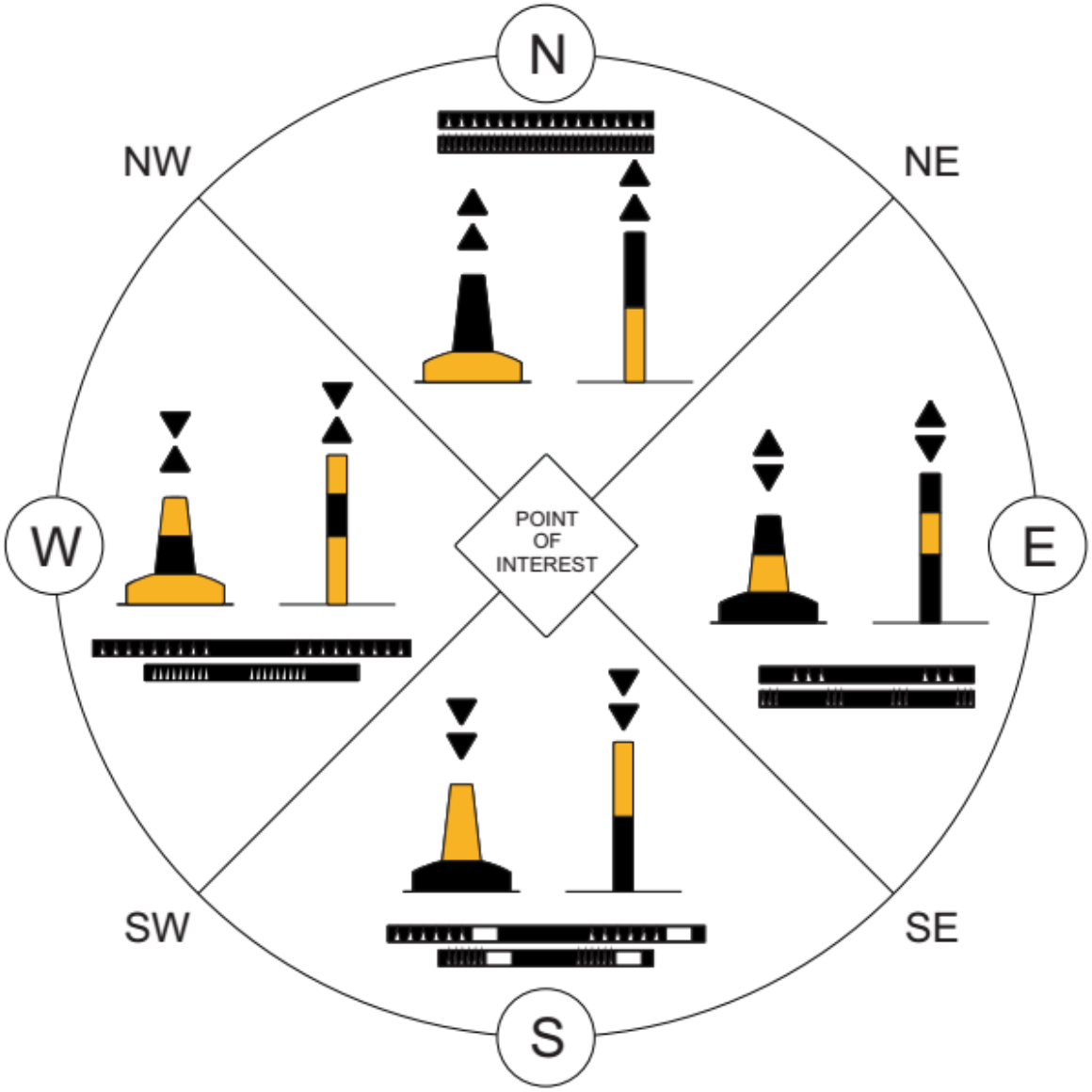
3.2.4 Competent authorities should consider carefully before establishing too many cardinal marks in a waterway or area as this can lead to confusion, given their white lights of similar characteristics.

3.3 Description of Cardinal Marks

	3.3.1 North Cardinal Mark	3.3.2 East Cardinal Mark
Topmark [a]	2 black cones, one above the other, points upward	2 black cones, one above the other, base to base
Colour	Black above yellow	Black with a single broad horizontal yellow band
Shape of buoys	Pillar or spar	Pillar or spar
Light (when fitted)		
Colour	White	White
Rhythm	VQ or Q	VQ(3) every 5s or Q(3) every 10s

	3.3.3 South Cardinal Mark	3.3.4 West Cardinal Mark
Topmark [a]	2 black cones, one above the other, points downward	2 black cones, one above the other, point to point
Colour	Yellow above black	Yellow with a single broad horizontal black band
Shape of buoys	Pillar or spar	Pillar or spar
Light (when fitted)		
Colour	White	White
Rhythm	VQ(6) + Long flash every 10s or Q(6) + Long flash every 15s	VQ(9) every 10s or Q(9) every 15s

Note [a] : The double cone top-mark is a very important feature of every Cardinal mark by day, and should be used wherever practicable and be as large as possible with a clear separation between the cones.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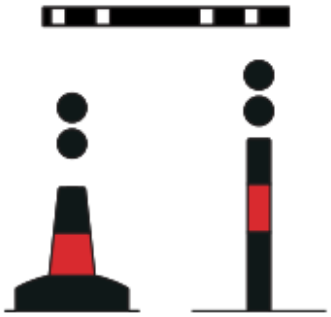
4. ISOLATED DANGER MARKS



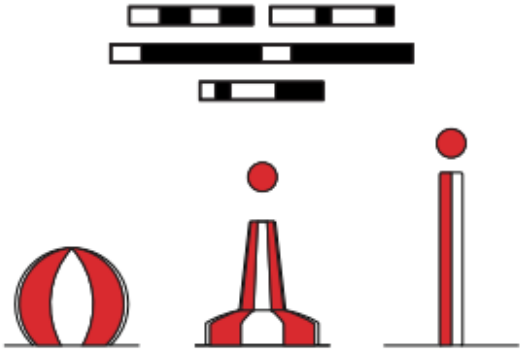
4.1 Definition of Isolated Danger Marks

An isolated Danger mark is a mark erected on, or moored on or above, an isolated danger which has navigable water all around it.

4.2 Description of Isolated Danger Marks

	Description
Top-mark [h]	Two black spheres, one above the other
Colour	Black with one or more broad horizontal red bands
Shape of buoy	Optional, but not conflicting with lateral marks; pillar or spar preferred
Light (when fitted)	
Colour	White
Rhythm	Group flashing (2)

5. SAFE WATER MARKS



5.1 Definition of Safe Water Marks

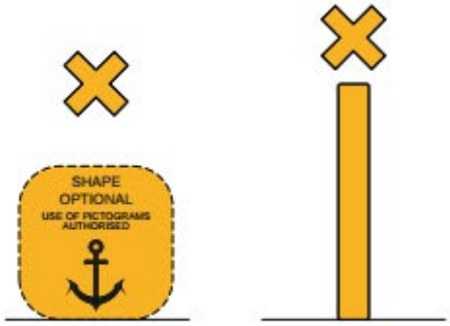
Safe Water marks serve to indicate that there is navigable water all round the mark. These include centre line marks and mid-channel marks. Such a mark may also be used to indicate channel entrance, port or estuary approach, or landfall. The light rhythm may also be used to indicate best point of passage under bridges.

5.2 Description of Safe Water Marks

	Description
Colour	Red and white vertical stripes
Shape of buoy	Spherical; pillar or spar with spherical topmark
Top-mark (if any)	Single red sphere
Light (when fitted)	
Colour	White
Rhythm	Isophase, occulting, one long flash every 10s or Morse "A"

Note [h] : The double sphere topmark is a very important feature of every Isolated Danger mark by day, and should be used wherever practicable and be as large as possible with a clear separation between the spheres.

6. SPECIAL MARKS



6.1 Definition of Special Marks

Marks used to indicate a special area or feature whose nature may be apparent from reference to a chart or other nautical publication. They are not generally intended to mark channels or obstructions where other marks are more suitable.

Some examples of uses of Special Marks

6.1.2 Ocean Data Acquisition Systems (ODAS) marks.

6.1.2 Traffic separation marks where use of conventional channel marking may cause confusion.

6.1.3 Spoil Ground marks.

6.1.4 Military exercise zone marks.

6.1.5 Cable or pipeline marks.

6.1.6 Recreation zone marks.

6.1.7 Boundaries of anchorage areas

6.1.8 Structures such as offshore renewable energy installations

6.1.9 Aquaculture

6.2 Description of Special Marks

	Description
Colour	Yellow
Shape of buoy	Optional, but not conflicting with lateral marks
Top-mark (if any)	Single yellow "X" shape
Light (when fitted)	
Colour	Yellow
Rhythm	Any, other than those reserved for cardinal, isolated danger and safe water marks.
Pictogram	The use of pictograms is authorized, as defined by a competent authority.

7. MARKING NEW DANGERS

7.1 Definition of New Dangers

The term "New Danger" is used to describe newly discovered hazards not yet shown in nautical documents. 'New Dangers' include naturally occurring obstructions such as sandbanks or rocks or man-made dangers such as wrecks.

7.2 Marking of New Dangers

7.2.1 'New Dangers' should be appropriately marked using Lateral, Cardinal, Isolated Danger marks or by using the Emergency Wreck Marking Buoy. If the Authority considers the risk to navigation to be especially high, at least one of the marks should be duplicated.

7.2.2 If using a Lateral lighted mark for this purpose a VQ or Q light character shall be used.

7.2.3 Any duplicate mark shall be identical to its partner in all respects.

7.2.4 In addition it may be marked by a Racon, coded Morse "D"(- ••)

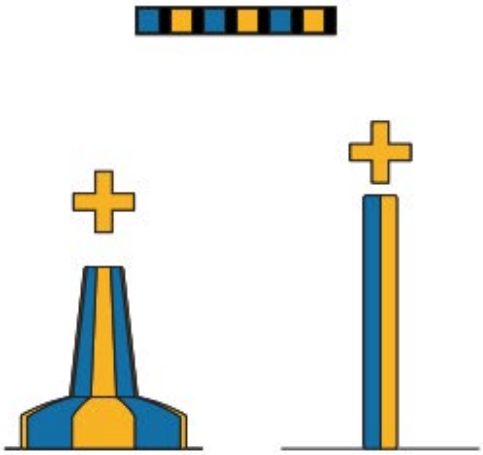
7.2.5 In addition it may be marked by other electronic means, such as automatic identification system (AIS as an AtoN).

7.2.6 Virtual Aids to Navigation may be deployed solely or in addition to physical Aids to Navigation.

7.2.7 The marking of the new danger may be removed when the competent Authority is satisfied that information concerning the "New Danger" has been sufficiently promulgated or the danger otherwise resolved.

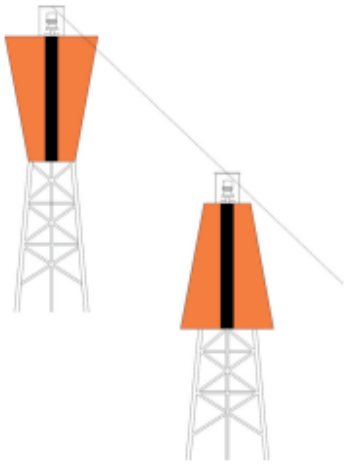
7.3 Description of New Dangers Marks

	Description
Colour	Blue/Yellow vertical stripes in equal number dimensions (minimum 4 stripes and maximum 8)
Shape of buoy	Pillar or spar
Top-mark (if any)	Vertical/perpendicular Yellow cross
Light	
Colour	Yellow/blue alternating
Rhythm	One second of blue light and one second of yellow light with 0.5 sec. of darkness between



8. OTHER MARKS

8.1 Leading Lines/Ranges



8.1.1 Definition of Leading Lines/Ranges

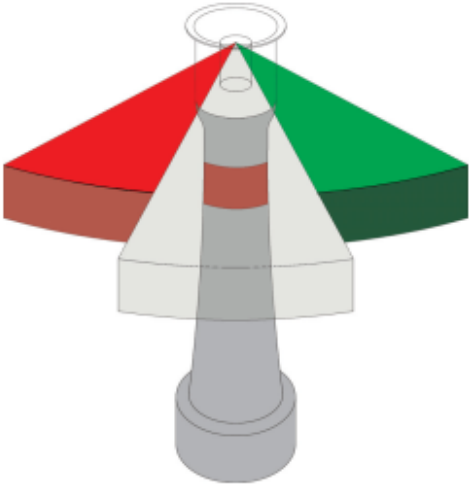
A group of two or more marks or lights, in the same vertical plane such that the navigator can follow the leading line on the same bearing.

8.1.2 Description of Leading Lines

Leading Line structures can be any colour or shape that provides a distinctive mark that cannot be confused with adjacent structures.

Description	
Colour	No colour significance. Competent authority determines the optimum colours to contrast with the dominant background colour at the location
Shape	No shape significance. Rectangular or triangular figures are recommended.
Light (when fitted)	
Colour	Any colour. Competent authority determines the optimum colour to contrast with the dominant back ground colour at the location.
Rhytm	Any, however fixed characteristics should be used sparingly and the use of synchronisation can assist in the overcoming background light.

8.2 Sector Lights



8.2.1 Definition of Sector Lights

A sector light is a fixed aid to navigation that displays a light of different colours and/or rhythms over designated arcs. The colour of the light provides directional information to the mariner.

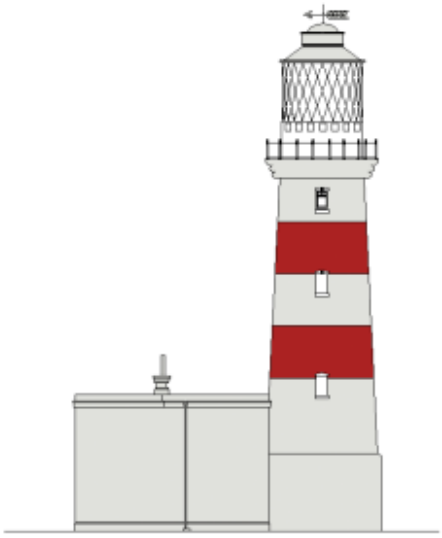
8.2.2 Description of Sector Lights

A sector light may be used:

- To provide directional information in a fairway;
- To indicate a turning point, a junction with other channels, a hazard or other items of navigational importance;
- To provide information on hazard areas that should be avoided;
- In some cases a single directional light may be used.

Description	
Colour	Not applicable
Shape	None, light only
Light	
Colour	If using to mark channel limits follow convention for IALA region indicated in Section 2. Lights may have oscillating boundaries
Rhythm	As appropriate

8.3 Lighthouses



8.3.1 Definition of a Lighthouse

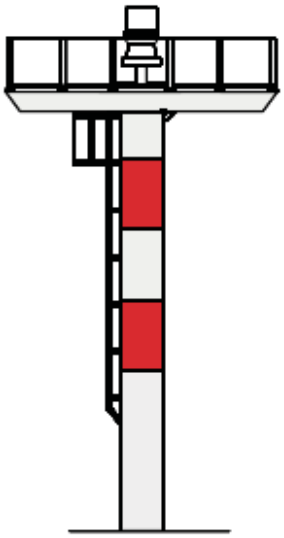
A lighthouse is a tower, or substantial building or structure, erected at a designated geographical location to carry a signal light and provides a significant daymark. It provides a long or medium range light for identification by night.

8.3.2 Description of a Lighthouse

It may provide a platform for other AtoN such as DGNSS, racon or AIS as an Aids to Navigation to assist marine navigation. A lighthouse is a structure that may provide a daymark for identification by day.
A sector light may also be incorporated into the structure.

Description	
Colour/Shape	Lighthouse structures can be of any colour, shape, or material generally designed to provide a distinctive daymark.
Light	
Colour	White, Red, or Green
Rhythm	Any number of flashes, isophase or occulting or as appropriate, to allow light to be readily identifiable.

8.4 Beacons



8.4.1 Definition of a Beacon

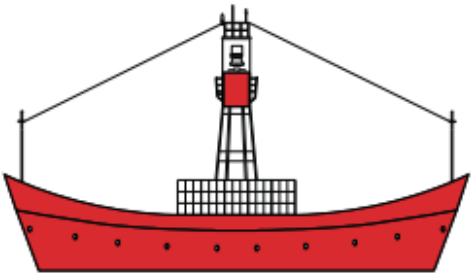
A fixed man-made navigation mark that can be recognised by its shape, colour, pattern, topmark, or light character, or a combination of these.

8.4.2 Description of a Beacon

- Can carry a signal light and in this case is termed a light beacon or lighted beacon;
- If not fitted with a light it is termed an unlighted or unlit beacon and provides only a day mark;
- As a leading line/range or conspicuous radar mark;
- It may also carry a topmark.

Description	
Colour	Any
Shape	As appropriate, including cardinal mark
Topmark (if any)	As appropriate
Light (when fitted)	
Colour	White, Red, or Green
Rhythm	As appropriate

8.5 Major Floating Aids



8.5.1 Definition of Major Floating Aids

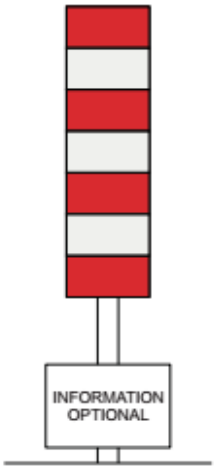
Major floating aids include lightvessels, light floats and large navigational buoys.

8.5.2 Description of Major Floating Aids

Major floating aids are generally deployed at critical locations, intended to mark approaches from offshore areas, where shipping traffic concentrations are high. It may provide a platform for other Aids to Navigation such as, racon or AIS as an Aids to Navigation to assist marine navigation.

Description	
Colour	As appropriate - predominantly red
Shape	Vessel or buoy shape with light tower
Light (when fitted) including off station lights	
Colour	As appropriate
Rhythm	As appropriate

8.6 Auxiliary Marks



8.6.1 Definition of Auxiliary Marks

Minor aids that have not been previously described.

8.6.2 Description of Auxiliary Marks

These marks are usually outside of defined channels and generally do not indicate the port and starboard sides of the route to be followed or obstructions to be avoided. They also include those marks used to convey information related to navigation safety. These marks shall not conflict with other navigational marks and shall be promulgated in appropriate nautical charts and documents. Should not generally be used if a more appropriate mark is available within the MBS.

8.7 Port or Harbour Marks

Mariners should be careful to take account of any local marking measures that may be in place and will often be covered by Local Regulations or by-laws. Before transiting an area for the first time, mariners should make themselves aware of local marking arrangements.

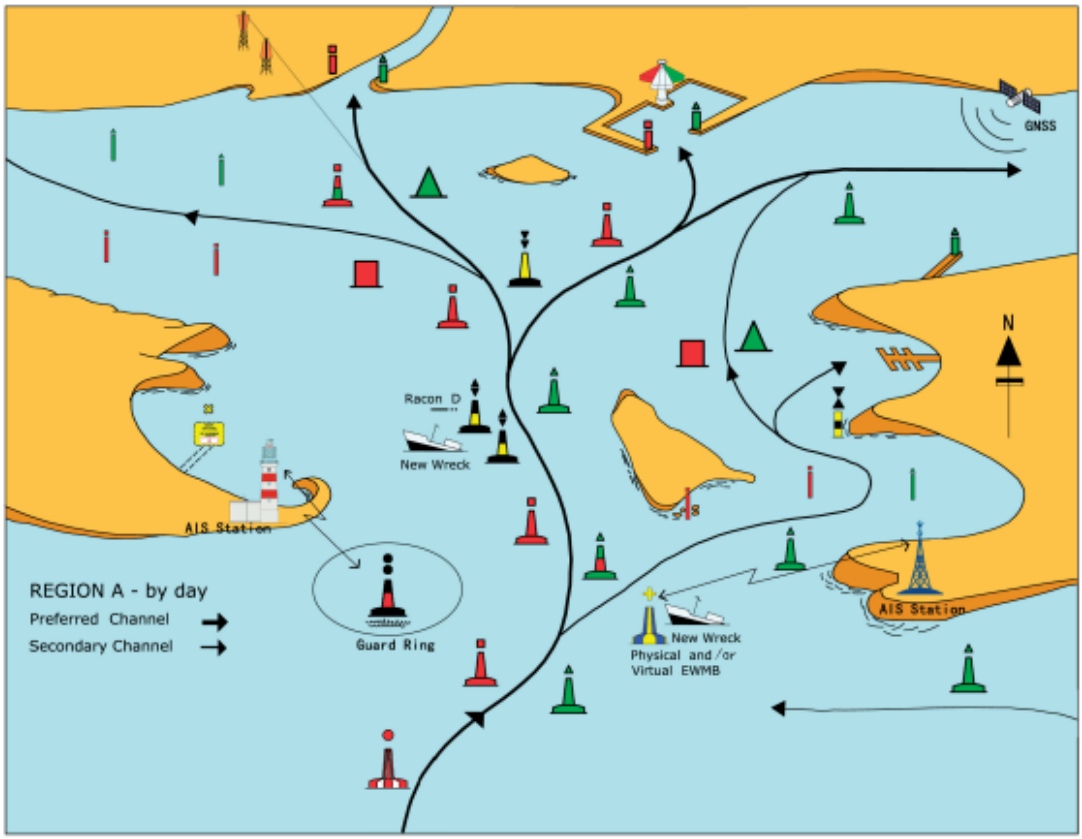
Local Aids to Navigation may include, but not be restricted to, marking of:

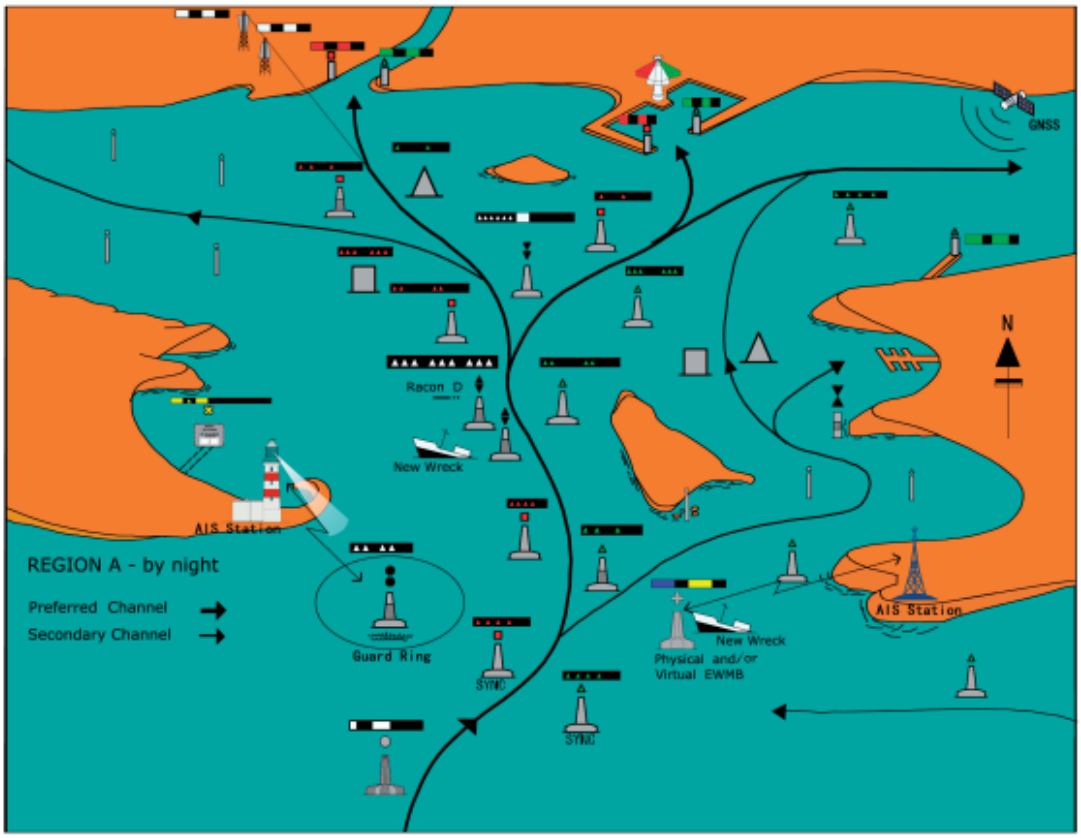
- breakwaters, quays and jetties;
- bridges and traffic signals;
- leisure areas.

and other river, channel, canal, lock and waterways marked within the responsibilities of competent authorities.

9. IALA RECOMMENDATIONS AND GUIDELINES

IALA Recommendations and Guidelines provide information on planning, operating, managing, and implementing the marks authorized by the MBS and can be found via the IALA website at: **www.iala-aism.org**.





Maritime Buoyage System
Region A

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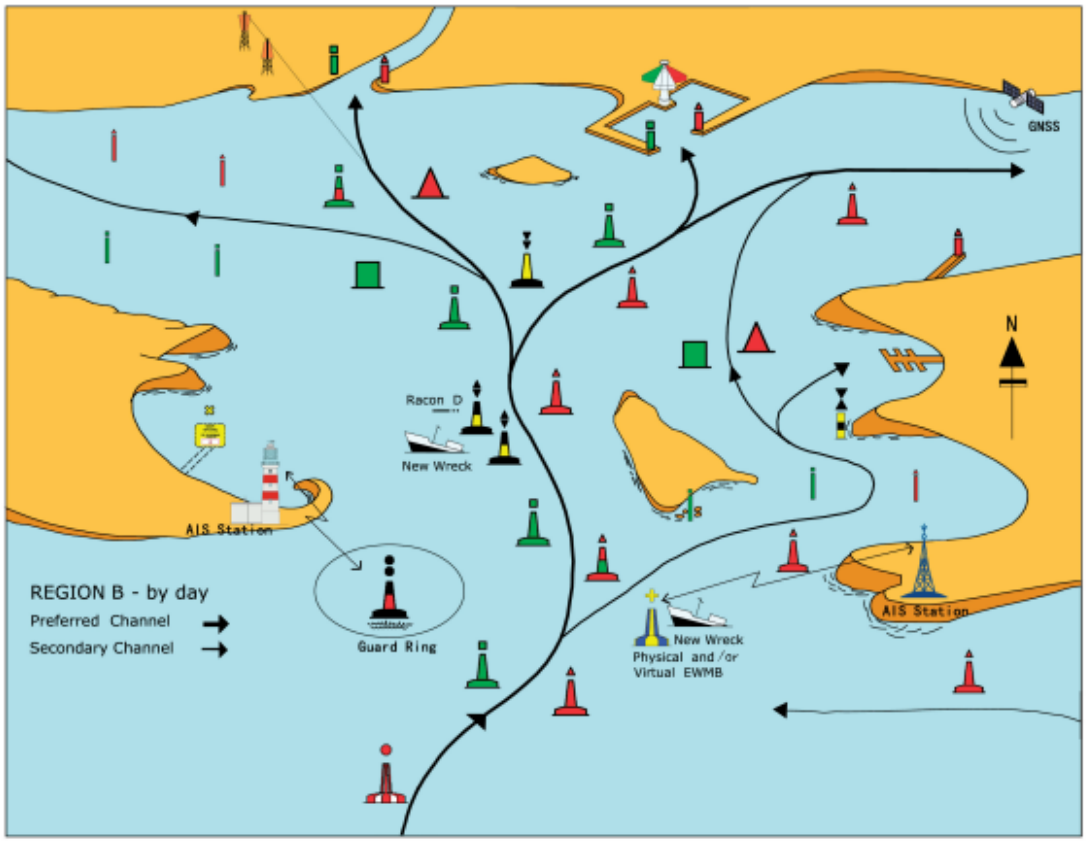
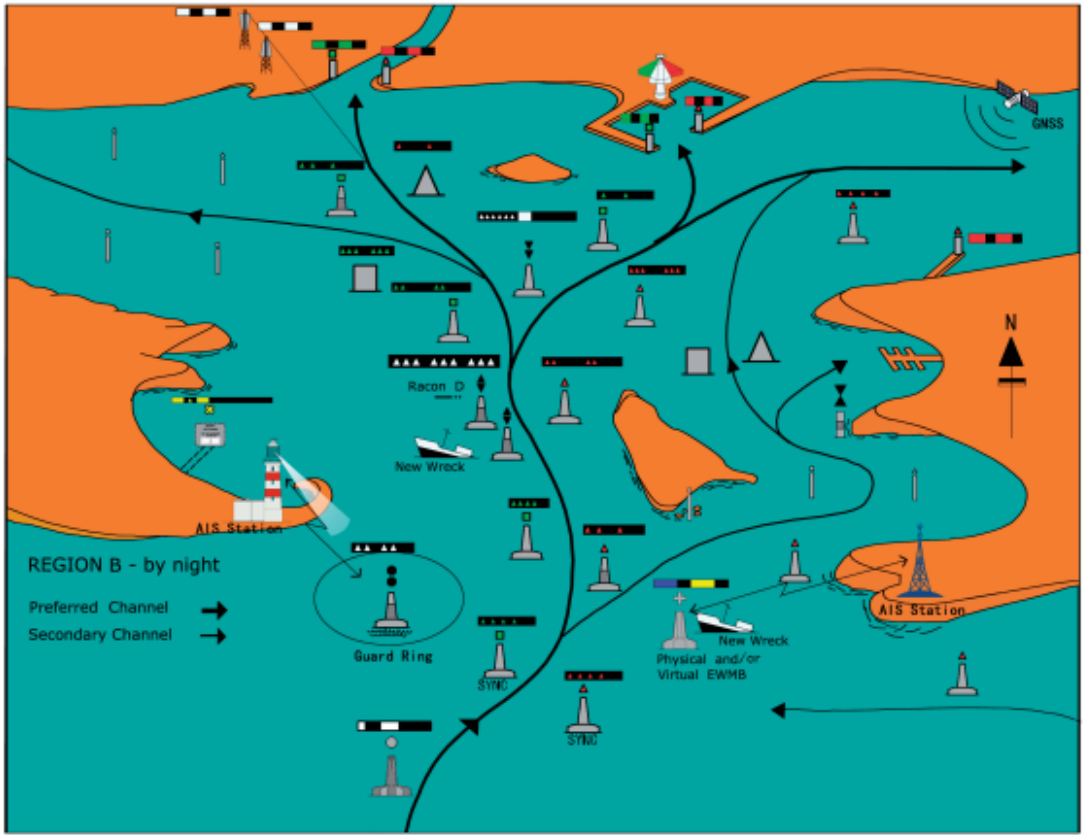

GNSS
N
Racon D
New Wreck
AIS Station
REGION B - by day
Preferred Channel
Secondary Channel
Guard Ring
New Wreck
Physical and /or
Virtual EWMB
AIS Station


GNSS
N
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Preferred Channel
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Guard Ring
SYNC
SYNC
New Wreck
Physical and/or
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AIS Station

INTERNATIONAL ASSOCIATION
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