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# 1 Catalogue Header

Name: Feature Catalogue for S-201 AtoN  
Scope: Ocean, Coastal, Ports, Harbors and Inland waters  
Field of Application: Marine Navigation  
Version Number: 0.0.1  
Version Date: 2015 - 10 - 16

Producer/ Individual name: Organisation name: IALA Position Name:   
Contact information: Contact instructions: IALA e-Nav Committee WG1  
  
Role: pointOfContact

Classification: unclassified

# 2 Definition Sources

*(no definition sources present)*

# 3 Simple Attributes

## 3.1 Aid availability category (*no alias*)

Name: **Aid availability category** Code (registry camel case): "aidAvailabilityCategory"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "Category 1" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "1" |  |
| "Category 2" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "2" |  |
| "Categpru 3" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "3" |  |

## 3.2 AtoN maintenance record (*no alias*)

Name: **AtoN maintenance record** Code (registry camel case): "atoNMaintenanceRecord"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.3 Beacon shape (BCNSHP)

Name: **Beacon shape** Code (registry camel case): "beaconShape"

IHO Definition: The shape a beacon exhibits

**Definition reference**: *(no definition references)*

Alias: BCNSHP

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "stake, pole, perch, post" Alias: (no aliases) | an elongated wood or metal pole, embedded in the bottom to serve as a navigational aid or a support for a navigational aid. **Definition reference**: *(no definition references)* | "1" |  |
| "withy" Alias: (no aliases) | a tree without roots stuck or spoiled into the bottom of the sea to serve as a navigational aid. **Definition reference**: *(no definition references)* | "2" |  |
| "beacon tower" Alias: (no aliases) | a solid structure of the order of 10 metres in height used as a navigational aid. **Definition reference**: *(no definition references)* | "3" |  |
| "lattice beacon" Alias: (no aliases) | a structure consisting of strips of metal or wood crossed or interlaced to form a structure to serve as an aid to navigation or as a support for an aid to navigation. **Definition reference**: *(no definition references)* | "4" |  |
| "pile beacon" Alias: (no aliases) | a long heavy timber(s) or section(s) of steel, wood, concrete, etc., forced into the seabed to serve as an aid to navigation or as a support for an aid to navigation. **Definition reference**: *(no definition references)* | "5" |  |
| "cairn" Alias: (no aliases) | a mound of stones, usually conical or pyramidal, raised specifically for maritime navigation. **Definition reference**: *(no definition references)* | "6" |  |
| "buoyant beacon" Alias: (no aliases) | a tall spar-like beacon fitted with a permanently submerged buoyancy chamber, the lower end of the body is secured to seabed sinker either by a flexible joint or by a cable under tension. **Definition reference**: *(no definition references)* | "7" |  |

## 3.4 Building shape (BUISHP)

Name: **Building shape** Code (registry camel case): "buildingShape"

IHO Definition: The specific shape of the building.

**Definition reference**: *(no definition references)*

Alias: BUISHP

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "high-rise building" Alias: (no aliases) | a building having many storeys. **Definition reference**: *(no definition references)* | "5" |  |
| "pyramid" Alias: (no aliases) | a polyhedron of which one face is a polygon of any number of sides, and the other faces are triangles with a common vertex. **Definition reference**: *(no definition references)* | "6" |  |
| "cylindrical" Alias: (no aliases) | shaped like a cylinder, which is a solid geometrical figure generated by straight lines fixed in direction and describing with one of its points a closed curve, especially a circle. **Definition reference**: *(no definition references)* | "7" |  |
| "spherical" Alias: (no aliases) | shaped like a sphere, which is a body the surface of which is at all points equidistant from the centre. **Definition reference**: *(no definition references)* | "8" |  |
| "cubic" Alias: (no aliases) | a shape the sides of which are six equal squares a regular hexahedron. **Definition reference**: *(no definition references)* | "9" |  |

## 3.5 Buoy shape (BOYSHP)

Name: **Buoy shape** Code (registry camel case): "buoyShape"

IHO Definition: The shape a buoy exhibits

**Definition reference**: *(no definition references)*

Alias: BOYSHP

Remarks: The principal shapes are those recommended in the International Association of Lighthouse Authorities - IALA System.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "conical (nun, ogival)" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure, has approximately the shape or the appearance of a pointed cone with the point upwards. **Definition reference**: *(no definition references)* | "1" |  |
| "can (cylindrical)" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure, has the shape of a cylinder, or a truncated cone that approximates to a cylinder, with a flat end uppermost. **Definition reference**: *(no definition references)* | "2" |  |
| "spherical" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure, has the shape of a part of a sphere. **Definition reference**: *(no definition references)* | "3" |  |
| "pillar" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure is a narrow vertical structure, pillar or lattice tower. **Definition reference**: *(no definition references)* | "4" |  |
| "spar (spindle)" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure, has the form of a pole, or of a very long cylinder, floating upright. **Definition reference**: *(no definition references)* | "5" |  |
| "barrel (tun)" Alias: (no aliases) | the upper part of the body above the water-line, or the greater part of the superstructure, has the form of a barrel or cylinder floating horizontally. **Definition reference**: *(no definition references)* | "6" |  |
| "super-buoy" Alias: (no aliases) | a very large buoy, generally more than 5m in diameter. **Definition reference**: *(no definition references)* | "7" |  |
| "ice buoy" Alias: (no aliases) | a specially constructed shuttle shaped buoy which is used in ice conditions. **Definition reference**: *(no definition references)* | "8" |  |

## 3.6 Category of aggregation (*no alias*)

Name: **Category of aggregation** Code (registry camel case): "categoryOfAggregation"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "leading line" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "1" |  |
| "range system" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "2" |  |

## 3.7 Category of association (*no alias*)

Name: **Category of association** Code (registry camel case): "categoryOfAssociation"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "channel markings" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "1" |  |
| "danger markings" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "2" |  |

## 3.8 Category of cardinal mark (CATCAM)

Name: **Category of cardinal mark** Code (registry camel case): "categoryOfCardinalMark"

IHO Definition: Cardinal marks are classified according to the quadrant of space they occupy.

**Definition reference**: *(no definition references)*

Alias: CATCAM

Remarks: Cardinal marks are used in conjunction with the compass to indicate where a mariner will find safe navigable water. 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. (Note that such top-marks are encoded as separate TOPMAR objects). Cardinal marks may also have a special system of flashing white lights and if such lights are fitted they are encoded as separate LIGHTS objects.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "north cardinal mark" Alias: (no aliases) | Quadrant bounded by the true bearing NW-NE taken from the point of interest it should be passed to the north side of the mark. **Definition reference**: *(no definition references)* | "1" |  |
| "east cardinal mark" Alias: (no aliases) | Quadrant bounded by the true bearing NE-SE taken from the point of interest it should be passed to the east side of the mark. **Definition reference**: *(no definition references)* | "2" |  |
| "south cardinal mark" Alias: (no aliases) | Quadrant bounded by the true bearing SE-SW taken from the point of interest it should be passed to the south side of the mark. **Definition reference**: *(no definition references)* | "3" |  |
| "west cardinal mark" Alias: (no aliases) | Quadrant bounded by the true bearing SW-NW taken from the point of interest it should be passed to the west side of the mark. **Definition reference**: *(no definition references)* | "4" |  |

## 3.9 Category of fog signal (CATFOG)

Name: **Category of fog signal** Code (registry camel case): "categoryOfFogSignal"

IHO Definition: Classification of the various means of generating the fog signal.

**Definition reference**: *(no definition references)*

Alias: CATFOG

Remarks: The classification 'horn' is the generic term for fog signals 'nautophone', 'reed' and 'tyfon'.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "explosive" Alias: (no aliases) | a signal produced by the firing of explosive charges. **Definition reference**: *(no definition references)* | "1" |  |
| "diaphone" Alias: (no aliases) | a diaphone uses compressed air and generally emits a powerful low-pitched sound, which often concludes with a brief sound of suddenly lowered pitch, termed the 'grunt'. **Definition reference**: *(no definition references)* | "2" |  |
| "siren" Alias: (no aliases) | a siren uses compressed air and exists in a variety of types which differ considerably in their sound and power. **Definition reference**: *(no definition references)* | "3" |  |
| "nautophone" Alias: (no aliases) | a horn having a diaphragm oscillated by electricity **Definition reference**: *(no definition references)* | "4" |  |
| "reed" Alias: (no aliases) | a reed uses compressed air and emits a weak, high pitched sound. **Definition reference**: *(no definition references)* | "5" |  |
| "tyfon" Alias: (no aliases) | a diaphragm horn which operates under the influence of compressed air or steam **Definition reference**: *(no definition references)* | "6" |  |
| "bell" Alias: (no aliases) | a ringing sound with a short range. **Definition reference**: *(no definition references)* | "7" |  |
| "whistle" Alias: (no aliases) | a distinctive sound made by a jet of air passing through an orifice. **Definition reference**: *(no definition references)* | "8" |  |
| "gong" Alias: (no aliases) | a sound produced by vibration of a disc when struck. **Definition reference**: *(no definition references)* | "9" |  |
| "horn" Alias: (no aliases) | a horn uses compressed air or electricity to vibrate a diaphragm and exists in a variety of types which differ greatly in their sound and power. **Definition reference**: *(no definition references)* | "10" |  |

## 3.10 Category of installation buoy (CATINB)

Name: **Category of installation buoy** Code (registry camel case): "categoryOfInstallationBuoy"

IHO Definition: Classification of fixed installation buoy

**Definition reference**: *(no definition references)*

Alias: CATINB

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "catenary anchor leg mooring (CALM)" Alias: (no aliases) | incorporates a large buoy which remains on the surface at all times and is moored by 4 or more anchors. Mooring hawsers and cargo hoses lead from a turntable on top of the buoy, so that the buoy does not turn as the ship swings to wind and stream. **Definition reference**: *(no definition references)* | "1" |  |
| "single buoy mooring (SBM)" Alias: (no aliases) | a mooring structure used by tankers to load and unload in port approaches or in offshore oil and gas fields. The size of the structure can vary between a large mooring buoy and a manned floating structure. Also known as single point mooring (SPM) **Definition reference**: *(no definition references)* | "2" |  |

## 3.11 Category of lateral mark (CATLAM)

Name: **Category of lateral mark** Code (registry camel case): "categoryOfLateralMark"

IHO Definition: Classification of lateral buoys

**Definition reference**: *(no definition references)*

Alias: CATLAM

Remarks: There are two international buoyage regions, A and B, between which lateral marks differ. The buoyage region is encoded using the separate attribute MARSYS. When top-marks, retro reflectors and/or lights are fitted to these marks, they are encoded as separate objects.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "port-hand lateral mark" Alias: (no aliases) | indicates the port boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. **Definition reference**: *(no definition references)* | "1" |  |
| "starboard-hand lateral mark" Alias: (no aliases) | indicates the starboard boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. **Definition reference**: *(no definition references)* | "2" |  |
| "preferred channel to starboard lateral mark" Alias: (no aliases) | at a point where a channel divides, when proceeding in the 'conventional direction of buoyage', the preferred channel (or primary route) is indicated by a modified port-hand lateral mark. **Definition reference**: *(no definition references)* | "3" |  |
| "preferred channel to port lateral mark" Alias: (no aliases) | at a point where a channel divides, when proceeding in the 'conventional direction of buoyage', the preferred channel (or primary route) is indicated by a modified starboard-hand lateral mark. **Definition reference**: *(no definition references)* | "4" |  |

## 3.12 Category of light (CATLIT)

Name: **Category of light** Code (registry camel case): "categoryOfLight"

IHO Definition: Classification of diffrent light types

**Definition reference**: *(no definition references)*

Alias: CATLIT

Remarks: Marine light (a light intended primarily for marine navigation) is not included in the above list. All lights are considered to be marine lights unless the attribute 'category of light' indicates otherwise.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "leading light" Alias: (no aliases) | a light associated with other lights so as to form a leading line to be followed. **Definition reference**: *(no definition references)* | "4" |  |
| "aero light" Alias: (no aliases) | an aero light is established for aeronautical navigation and may be of higher power than marine lights and visible from well offshore. **Definition reference**: *(no definition references)* | "5" |  |
| "air obstruction light" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "6" |  |
| "fog detector light" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "7" |  |
| "flood light" Alias: (no aliases) | a broad beam light used to illuminate a structure or area. **Definition reference**: *(no definition references)* | "8" |  |
| "strip light" Alias: (no aliases) | a light whose source has a linear form generally horizontal, which can reach a length of several metres. **Definition reference**: *(no definition references)* | "9" |  |
| "subsidiary light" Alias: (no aliases) | a light placed on or near the support of a main light and having a special use in navigation. **Definition reference**: *(no definition references)* | "10" |  |
| "spotlight" Alias: (no aliases) | a powerful light focused so as to illuminate a small area. **Definition reference**: *(no definition references)* | "11" |  |
| "front" Alias: (no aliases) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. **Definition reference**: *(no definition references)* | "12" |  |
| "rear" Alias: (no aliases) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. **Definition reference**: *(no definition references)* | "13" |  |
| "lower" Alias: (no aliases) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. **Definition reference**: *(no definition references)* | "14" |  |
| "upper" Alias: (no aliases) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. **Definition reference**: *(no definition references)* | "15" |  |
| "emergency" Alias: (no aliases) | a light available as a backup to a main light which will be illuminated should the main light fail. **Definition reference**: *(no definition references)* | "17" |  |
| "bearing light" Alias: (no aliases) | a light which enables its approximate bearing to be obtained without the use of a compass. **Definition reference**: *(no definition references)* | "18" |  |
| "horizontally disposed" Alias: (no aliases) | a group of lights of identical character and almost identical position, that are disposed horizontally. **Definition reference**: *(no definition references)* | "19" |  |
| "vertically disposed" Alias: (no aliases) | a group of lights of identical character and almost identical position, that are disposed vertically. **Definition reference**: *(no definition references)* | "20" |  |

## 3.13 Category of navigation line (CATNAV)

Name: **Category of navigation line** Code (registry camel case): "categoryOfNavigationLine"

IHO Definition: Classification of route guidence given to vessels

**Definition reference**: *(no definition references)*

Alias: CATNAV

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "clearing line" Alias: (no aliases) | a straight line that marks the boundary between a safe and a dangerous area or that passes clear of a navigational danger. **Definition reference**: *(no definition references)* | "1" |  |
| "transit line" Alias: (no aliases) | a line passing through one or more fixed marks. **Definition reference**: *(no definition references)* | "2" |  |
| "leading line bearing a recommended track" Alias: (no aliases) | a line passing through one or more clearly defined objects, along the path of which a vessel can approach safely up to a certain distance off. **Definition reference**: *(no definition references)* | "3" |  |

## 3.14 Category of offshore platform (CATOFP)

Name: **Category of offshore platform** Code (registry camel case): "categoryOfOffshorePlatform"

IHO Definition: Classification of an offshore raised structure

**Definition reference**: *(no definition references)*

Alias: CATOFP

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "oil derrick/rig" Alias: (no aliases) | a temporary mobile structure, either fixed or floating, used in the exploration stages of oil and gas fields. **Definition reference**: *(no definition references)* | "1" |  |
| "production platform" Alias: (no aliases) | a term used to indicate a permanent offshore structure equipped to control the flow of oil or gas. It does not include entirely submarine structures. **Definition reference**: *(no definition references)* | "2" |  |
| "observation/research platform" Alias: (no aliases) | a platform from which one's surroundings or events can be observed, noted or recorded such as for scientific study. **Definition reference**: *(no definition references)* | "3" |  |
| "articulated loading platform (ALP)" Alias: (no aliases) | a metal lattice tower, buoyant at one end and attached at the other by a universal joint to a concrete filled base on the sea bed. The platform may be fitted with a helicopter platform, emergency accommodation and hawser/hose retrieval. **Definition reference**: *(no definition references)* | "4" |  |
| "single anchor leg mooring (SALM)" Alias: (no aliases) | a rigid frame or tube with a buoyancy device at its upper end , secured at its lower end to a universal joint on a large steel or concrete base resting on the sea bed, and at its upper end to a mooring buoy by a chain or wire. **Definition reference**: *(no definition references)* | "5" |  |
| "mooring tower" Alias: (no aliases) | a platform secured to the sea bed and surmounted by a turntable to which ships moor. **Definition reference**: *(no definition references)* | "6" |  |
| "artificial island" Alias: (no aliases) | a man-made structure usually built for the exploration or exploitation of marine resources, marine scientific research, tidal observations, etc. **Definition reference**: *(no definition references)* | "7" |  |
| "floating production, storage and offloading vessel (FPSO)" Alias: (no aliases) | an offshore oil/gas facility consisting of a moored tanker/barge by which the product is extracted, stored and exported. **Definition reference**: *(no definition references)* | "8" |  |
| "accommodation platform" Alias: (no aliases) | a platform used primarily for eating, sleeping and recreation purposes. **Definition reference**: *(no definition references)* | "9" |  |
| "navigation, communication and control buoy (NCCB)" Alias: (no aliases) | a floating structure with control room, power and storage facilities, attached to the sea bed by a flexible pipeline and cables. **Definition reference**: *(no definition references)* | "10" |  |
| "offshore oil tank" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "11" |  |

## 3.15 Category of pile (CATPLE)

Name: **Category of pile** Code (registry camel case): "categoryOfPile"

IHO Definition: Classification of pile, driven into the earth as a foundation or support for a structure

**Definition reference**: *(no definition references)*

Alias: CATPLE

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "stake" Alias: (no aliases) | an elongated wood or metal pole embedded in the bottom to serve as a marker or support. **Definition reference**: *(no definition references)* | "1" |  |
| "post" Alias: (no aliases) | a vertical piece of timber, metal or concrete forced into the earth or sea bed. **Definition reference**: *(no definition references)* | "3" |  |
| "tripodal" Alias: (no aliases) | a single structure comprising 3 or more piles held together (sections of heavy timber, steel or concrete), and forced into the earth or sea bed. **Definition reference**: *(no definition references)* | "4" |  |
| "piling" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "5" |  |
| "area of piles" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "6" |  |
| "pipe" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "7" |  |

## 3.16 Category of radar transponder beacon (CATRTB)

Name: **Category of radar transponder beacon** Code (registry camel case): "categoryOfRadarTransponderBeacon"

IHO Definition: Classification of radar transponder beacon based on fuctionality.

**Definition reference**: *(no definition references)*

Alias: CATRTB

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "ramark, radar beacon transmitting continuously" Alias: (no aliases) | a radar marker beacon which continuously transmits a signal appearing as a radial line on a radar screen, the line indicating the direction of the beacon. Ramarks are intended primarily for marine use. The name 'ramark' is derived from the words radar marker. **Definition reference**: *(no definition references)* | "1" |  |
| "racon, radar transponder beacon" Alias: (no aliases) | a radar beacon which returns a coded signal which provides identification of the beacon, as well as range and bearing. The range and bearing are indicated by the location of the first character received on the radar screen. The name 'racon' is derived from the words radar beacon. **Definition reference**: *(no definition references)* | "2" |  |
| "leading racon/radar transponder beacon" Alias: (no aliases) | a radar beacon that may be used (in conjunction with at least one other radar beacon) to indicate a leading line. **Definition reference**: *(no definition references)* | "3" |  |

## 3.17 Category of recommended track (CATTRK)

Name: **Category of recommended track** Code (registry camel case): "categoryOfRecommendedTrack"

IHO Definition: Classification of track based on defining navigational marks

**Definition reference**: *(no definition references)*

Alias: CATTRK

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "based on a system of fixed marks" Alias: (no aliases) | a straight route (known as a recommended track, range or leading line), which comprises at least two structures (usually beacons or daymarks) and/or natural features, which may carry lights and/or top-marks. The structures/features are positioned so that when observed to be in line, a vessel can follow a known bearing with safety. **Definition reference**: *(no definition references)* | "1" |  |
| "not based on a system of fixed marks" Alias: (no aliases) | a route (known as a recommended track or preferred route) which is not based on a series of structures or features in line. **Definition reference**: *(no definition references)* | "2" |  |

## 3.18 Category of silo/tank (CATSIL)

Name: **Category of silo/tank** Code (registry camel case): "categoryOfSiloTank"

IHO Definition: Classification based on the product

**Definition reference**: *(no definition references)*

Alias: CATSIL

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "silo in general" Alias: (no aliases) | a generally cylindrical tower used for storing fodder or grain. **Definition reference**: *(no definition references)* | "1" |  |
| "tank in general" Alias: (no aliases) | a fixed structure for storing liquids. **Definition reference**: *(no definition references)* | "2" |  |
| "grain elevator" Alias: (no aliases) | a storage building for grain. Usually a tall frame, metal or concrete structure with an especially compartmented interior. **Definition reference**: *(no definition references)* | "3" |  |
| "water tower" Alias: (no aliases) | a tower with an elevated container used to hold water. **Definition reference**: *(no definition references)* | "4" |  |

## 3.19 Category of special purpose mark (CATSPM)

Name: **Category of special purpose mark** Code (registry camel case): "categoryOfSpecialPurposeMark"

IHO Definition: Classification of an aid to navigation which signifies some special purpose

**Definition reference**: *(no definition references)*

Alias: CATSPM

Remarks: A mark may be a beacon, a buoy, a signpost or may take another form.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "firing danger mark" Alias: (no aliases) | a mark used to indicate a firing danger area, usually at sea. **Definition reference**: *(no definition references)* | "1" |  |
| "target mark" Alias: (no aliases) | any object toward which something is directed. The distinctive marking or instrumentation of a ground point to aid its identification on a photograph. **Definition reference**: *(no definition references)* | "2" |  |
| "marker ship mark" Alias: (no aliases) | a mark marking the position of a ship which is used as a target during some military exercise. **Definition reference**: *(no definition references)* | "3" |  |
| "degaussing range mark" Alias: (no aliases) | a mark used to indicate a degaussing range. **Definition reference**: *(no definition references)* | "4" |  |
| "barge mark" Alias: (no aliases) | a mark of relevance to barges. **Definition reference**: *(no definition references)* | "5" |  |
| "cable mark" Alias: (no aliases) | a mark used to indicate the position of submarine cables or the point at which they run on to the land. **Definition reference**: *(no definition references)* | "6" |  |
| "spoil ground mark" Alias: (no aliases) | a mark used to indicate the limit of a spoil ground **Definition reference**: *(no definition references)* | "7" |  |
| "outfall mark" Alias: (no aliases) | a mark used to indicate the position of an outfall or the point at which it leaves the land. **Definition reference**: *(no definition references)* | "8" |  |
| "ODAS" Alias: (no aliases) | Ocean Data Acquisition System **Definition reference**: *(no definition references)* | "9" |  |
| "recording mark" Alias: (no aliases) | a mark used to record data for scientific purposes. **Definition reference**: *(no definition references)* | "10" |  |
| "seaplane anchorage mark" Alias: (no aliases) | a mark used to indicate a seaplane anchorage. **Definition reference**: *(no definition references)* | "11" |  |
| "recreation zone mark" Alias: (no aliases) | a mark used to indicate a recreation zone. **Definition reference**: *(no definition references)* | "12" |  |
| "private mark" Alias: (no aliases) | a privately maintained mark. **Definition reference**: *(no definition references)* | "13" |  |
| "mooring mark" Alias: (no aliases) | a mark indicating a mooring or moorings. **Definition reference**: *(no definition references)* | "14" |  |
| "LANBY" Alias: (no aliases) | a large buoy designed to take the place of a lightship where construction of an offshore light station is not feasible. **Definition reference**: *(no definition references)* | "15" |  |
| "leading mark" Alias: (no aliases) | aids to navigation or other indicators so located as to indicate the path to be followed. Leading marks identify a leading line when they are in transit. **Definition reference**: *(no definition references)* | "16" |  |
| "measured distance mark" Alias: (no aliases) | a mark forming part of a transit indicating one end of a measured distance. **Definition reference**: *(no definition references)* | "17" |  |
| "notice mark" Alias: (no aliases) | a notice board or sign indicating information to the mariner. **Definition reference**: *(no definition references)* | "18" |  |
| "TSS mark" Alias: (no aliases) | a mark indicating a traffic separation scheme. **Definition reference**: *(no definition references)* | "19" |  |
| "anchoring prohibited mark" Alias: (no aliases) | a mark indicating an anchoring prohibited area. **Definition reference**: *(no definition references)* | "20" |  |
| "berthing prohibited mark" Alias: (no aliases) | a mark indicating that berthing is prohibited. **Definition reference**: *(no definition references)* | "21" |  |
| "overtaking prohibited mark" Alias: (no aliases) | a mark indicating that overtaking is prohibited. **Definition reference**: *(no definition references)* | "22" |  |
| "two-way traffic prohibited mark" Alias: (no aliases) | a mark indicating a one-way route. **Definition reference**: *(no definition references)* | "23" |  |
| ""reduced wake" mark" Alias: (no aliases) | a mark indicating that vessels must not generate excessive wake. **Definition reference**: *(no definition references)* | "24" |  |
| "speed limit mark" Alias: (no aliases) | a mark indicating that a speed limit applies. **Definition reference**: *(no definition references)* | "25" |  |
| "stop mark" Alias: (no aliases) | a mark indicating the place where the bow of a ship must stop when traffic lights show red. **Definition reference**: *(no definition references)* | "26" |  |
| "general warning mark" Alias: (no aliases) | a mark indicating that special caution must be exercised in the vicinity of the mark. **Definition reference**: *(no definition references)* | "27" |  |
| ""sound ships siren" mark" Alias: (no aliases) | a mark indicating that a ship should sound its siren or horn. **Definition reference**: *(no definition references)* | "28" |  |
| "restricted vertical clearance mark" Alias: (no aliases) | a mark indicating the minimum vertical space available for passage. **Definition reference**: *(no definition references)* | "29" |  |
| "maximum vessel's draught mark" Alias: (no aliases) | a mark indicating the maximum draught of vessel permitted. **Definition reference**: *(no definition references)* | "30" |  |
| "restricted horizontal clearance mark" Alias: (no aliases) | a mark indicating the minimum horizontal space available for passage. **Definition reference**: *(no definition references)* | "31" |  |
| "strong current warning mark" Alias: (no aliases) | a mark warning of strong currents. **Definition reference**: *(no definition references)* | "32" |  |
| "berthing permitted mark" Alias: (no aliases) | a mark indicating that berthing is allowed. **Definition reference**: *(no definition references)* | "33" |  |
| "overhead power cable mark" Alias: (no aliases) | a mark indicating an overhead power cable. **Definition reference**: *(no definition references)* | "34" |  |
| ""channel edge gradient" mark" Alias: (no aliases) | a mark indicating the gradient of the slope of a dredge channel edge. **Definition reference**: *(no definition references)* | "35" |  |
| "telephone mark" Alias: (no aliases) | a mark indicating the presence of a telephone. **Definition reference**: *(no definition references)* | "36" |  |
| "ferry crossing mark" Alias: (no aliases) | a mark indicating that a ferry route crosses the ship route often used with a 'sound ship's siren' mark. **Definition reference**: *(no definition references)* | "37" |  |
| "pipeline mark" Alias: (no aliases) | a mark used to indicate the position of submarine pipelines or the point at which they run on to the land. **Definition reference**: *(no definition references)* | "39" |  |
| "anchorage mark" Alias: (no aliases) | a mark indicating an anchorage area. **Definition reference**: *(no definition references)* | "40" |  |
| "clearing mark" Alias: (no aliases) | a mark used to indicate a clearing line. **Definition reference**: *(no definition references)* | "41" |  |
| "control mark" Alias: (no aliases) | a mark indicating the location at which a restriction or requirement exists. **Definition reference**: *(no definition references)* | "42" |  |
| "diving mark" Alias: (no aliases) | a mark indicating that diving may take place in the vicinity. **Definition reference**: *(no definition references)* | "43" |  |
| "refuge beacon" Alias: (no aliases) | a mark providing or indicating a place of safety. **Definition reference**: *(no definition references)* | "44" |  |
| "foul ground mark" Alias: (no aliases) | a mark indicating a foul ground. **Definition reference**: *(no definition references)* | "45" |  |
| "yachting mark" Alias: (no aliases) | a mark installed for use by yachtsmen. **Definition reference**: *(no definition references)* | "46" |  |
| "heliport mark" Alias: (no aliases) | a mark indicating an area where helicopters may land. **Definition reference**: *(no definition references)* | "47" |  |
| "GNSS mark" Alias: (no aliases) | a mark indicating a location at which a GNSS position has been accurately determined. **Definition reference**: *(no definition references)* | "48" |  |
| "seaplane landing mark" Alias: (no aliases) | a mark indicating an area where sea-planes land. **Definition reference**: *(no definition references)* | "49" |  |
| "entry prohibited mark" Alias: (no aliases) | a mark indicating that entry is prohibited. **Definition reference**: *(no definition references)* | "50" |  |
| "work in progress mark" Alias: (no aliases) | a mark indicating that work (generally construction) is in progress. **Definition reference**: *(no definition references)* | "51" |  |
| "mark with unknown purpose" Alias: (no aliases) | a mark whose detailed characteristics are unknown. **Definition reference**: *(no definition references)* | "52" |  |
| "wellhead mark" Alias: (no aliases) | a mark indicating a borehole that produces or is capable of producing oil or natural gas. **Definition reference**: *(no definition references)* | "53" |  |
| "channel separation mark" Alias: (no aliases) | a mark indicating the point at which a channel divides separately into two channels. **Definition reference**: *(no definition references)* | "54" |  |
| "marine farm mark" Alias: (no aliases) | a mark indicating the existence of a fish, mussel, oyster or pearl farm/ culture. **Definition reference**: *(no definition references)* | "55" |  |
| "artificial reef mark" Alias: (no aliases) | a mark indicating the existence or the extent of an artificial reef. **Definition reference**: *(no definition references)* | "56" |  |
| "ice mark" Alias: (no aliases) | a mark, used year round, that may be submerged when ice passes through the area. **Definition reference**: *(no definition references)* | "57" |  |
| "nature reserve mark" Alias: (no aliases) | a mark used to define the boundary of a nature reserve. **Definition reference**: *(no definition references)* | "58" |  |
| "fish aggregating device (FAD)" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "59" |  |
| "wreck mark" Alias: (no aliases) | a mark used to indicate the existence of a wreck. **Definition reference**: *(no definition references)* | "60" |  |
| "customs mark" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "61" |  |
| "causeway mark" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "62" |  |
| "wave recorder" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "63" |  |

## 3.20 Colour (COLOUR)

Name: **Colour** Code (registry camel case): "colour"

IHO Definition: The property possessed by an object of producing different sensations on the eye as a result of the way it reflects or emits light.

**Definition reference**: *(no definition references)*

Alias: COLOUR

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "white" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "1" |  |
| "black" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "2" |  |
| "red" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "3" |  |
| "green" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "4" |  |
| "blue" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "5" |  |
| "yellow" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "6" |  |
| "grey" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "7" |  |
| "brown" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "8" |  |
| "amber" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "9" |  |
| "violet" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "10" |  |
| "orange" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "11" |  |
| "magenta" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "12" |  |
| "pink" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "13" |  |

## 3.21 Colour pattern (COLPAT)

Name: **Colour pattern** Code (registry camel case): "colourPattern"

IHO Definition: A regular repeated design containing more than one colour

**Definition reference**: *(no definition references)*

Alias: COLPAT

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "horizontal stripes" Alias: (no aliases) | straight bands or stripes of differing colours painted horizontally. **Definition reference**: *(no definition references)* | "1" |  |
| "vertical stripes" Alias: (no aliases) | straight bands or stripes of differing colours painted vertically. **Definition reference**: *(no definition references)* | "2" |  |
| "diagonal stripes" Alias: (no aliases) | straight bands or stripes of differing colours painted diagonally (ie not horizontally or vertically). **Definition reference**: *(no definition references)* | "3" |  |
| "squared" Alias: (no aliases) | often referred to as checker plate, where alternate colours are used to create squares similar to a chess or draught board. The pattern may be straight or diagonal. **Definition reference**: *(no definition references)* | "4" |  |
| "stripes (direction unknown)" Alias: (no aliases) | straight bands or stripes of differing colours painted in an unknown direction. **Definition reference**: *(no definition references)* | "5" |  |
| "border stripe" Alias: (no aliases) | a band or stripe of colour which is displayed around the outer edge of the object, which may also form a border to an inner pattern or plain colour. **Definition reference**: *(no definition references)* | "6" |  |

## 3.22 Condition (CONDTN)

Name: **Condition** Code (registry camel case): "condition"

IHO Definition: The various conditions of buildings and other constructions.

**Definition reference**: *(no definition references)*

Alias: CONDTN

Remarks: The default 'condition' should be considered to be completed, undamaged and working normally. This attribute should, therefore, only be used to indicate objects whose condition is anything other than 'normal'.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "under construction" Alias: (no aliases) | a structure that is in the process of being built. **Definition reference**: *(no definition references)* | "1" |  |
| "ruined" Alias: (no aliases) | a structure in a decayed or deteriorated condition resulting from neglect or disuse, or a damaged structure in need of repair. **Definition reference**: *(no definition references)* | "2" |  |
| "under reclamation" Alias: (no aliases) | an area of the sea that is being reclaimed as land, usually by the dumping of earth and other material. **Definition reference**: *(no definition references)* | "3" |  |
| "wingless" Alias: (no aliases) | a windmill or windmotor from which the turbine blades are missing. **Definition reference**: *(no definition references)* | "4" |  |
| "planned construction" Alias: (no aliases) | an area where a future construction is planned. **Definition reference**: *(no definition references)* | "5" |  |

## 3.23 Date end (DATEND)

Name: **Date end** Code (registry camel case): "dateEnd"

IHO Definition: The latest date on which an object (e.g., a buoy) will be present.

**Definition reference**: *(no definition references)*

Alias: DATEND

Remarks: This attribute is to be used to indicate the removal or cancellation of an object at a specific date in the future. See also 'periodic date end' (PEREND).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.24 Date start (DATSTA)

Name: **Date start** Code (registry camel case): "dateStart"

IHO Definition: The earliest date on which an object (e.g., a buoy) will be present.

**Definition reference**: *(no definition references)*

Alias: DATSTA

Remarks: This attribute is to be used to indicate the deployment or implementation of an object at a specific date in the future. See also 'periodic date start' (PERSTA).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.25 Depth range value 2 (DRVAL2)

Name: **Depth range value 2** Code (registry camel case): "depthRangeMaximumValue"

IHO Definition: The maximum (deepest) value of a depth range.

**Definition reference**: *(no definition references)*

Alias: DRVAL2

Remarks: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.26 Depth range value 1 (DRVAL1)

Name: **Depth range value 1** Code (registry camel case): "depthRangeMinimumValue"

IHO Definition: The minimum (shoalest) value of a depth range.

**Definition reference**: *(no definition references)*

Alias: DRVAL1

Remarks: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.27 Elevation (ELEVAT)

Name: **Elevation** Code (registry camel case): "elevation"

IHO Definition: The altitude of the ground level of an object, measured from a specified vertical datum.

**Definition reference**: *(no definition references)*

Alias: ELEVAT

Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.28 Exhibition condition of light (EXCLIT)

Name: **Exhibition condition of light** Code (registry camel case): "exhibitionConditionOfLight"

IHO Definition: The outward display of the light

**Definition reference**: *(no definition references)*

Alias: EXCLIT

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "light shown without change of character" Alias: (no aliases) | a light shown throughout the 24 hours without change of character. **Definition reference**: *(no definition references)* | "1" |  |
| "daytime light" Alias: (no aliases) | a light which is only exhibited by day. **Definition reference**: *(no definition references)* | "2" |  |
| "fog light" Alias: (no aliases) | a light which is exhibited in fog or conditions of reduced visibility. **Definition reference**: *(no definition references)* | "3" |  |
| "night light" Alias: (no aliases) | a light which is only exhibited at night. **Definition reference**: *(no definition references)* | "4" |  |

## 3.29 Function (FUNCTN)

Name: **Function** Code (registry camel case): "function"

IHO Definition: A specific role that describes a feature

**Definition reference**: *(no definition references)*

Alias: FUNCTN

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "harbour-master's office" Alias: (no aliases) | the office of the local official who has charge of mooring and berthing of vessels, collecting harbour fees, etc. **Definition reference**: *(no definition references)* | "2" |  |
| "customs office" Alias: (no aliases) | an office which is charged with enforcing customs regulations. **Definition reference**: *(no definition references)* | "3" |  |
| "health office" Alias: (no aliases) | the office which is charged with the administration of health laws and sanitary inspections. **Definition reference**: *(no definition references)* | "4" |  |
| "hospital" Alias: (no aliases) | an institution or establishment providing medical or surgical treatment for the ill or wounded. **Definition reference**: *(no definition references)* | "5" |  |
| "post office" Alias: (no aliases) | the public department, agency or organisation responsible primarily for the collection, transmission and distribution of mail. **Definition reference**: *(no definition references)* | "6" |  |
| "hotel" Alias: (no aliases) | an establishment, especially of a comfortable or luxurious kind, where paying visitors are provided with accommodation, meals and other services. **Definition reference**: *(no definition references)* | "7" |  |
| "railway station" Alias: (no aliases) | a building with platforms where trains arrive, load, discharge and depart. **Definition reference**: *(no definition references)* | "8" |  |
| "police station" Alias: (no aliases) | the office of the local police force. **Definition reference**: *(no definition references)* | "9" |  |
| "water-police station" Alias: (no aliases) | the headquarters of a local water-police force. **Definition reference**: *(no definition references)* | "10" |  |
| "pilot office" Alias: (no aliases) | the office or headquarters of pilots the place where the services of a pilot may be obtained. **Definition reference**: *(no definition references)* | "11" |  |
| "pilot lookout" Alias: (no aliases) | a distinctive structure on shore from which personnel keep watch upon events at sea or along the coast. **Definition reference**: *(no definition references)* | "12" |  |
| "bank office" Alias: (no aliases) | an office for custody, deposit, loan, exchange or issue of money. **Definition reference**: *(no definition references)* | "13" |  |
| "headquarters for district control" Alias: (no aliases) | the quarters of an executive officer (director, manager, etc.) with responsibility for an administrative area. **Definition reference**: *(no definition references)* | "14" |  |
| "transit shed/warehouse" Alias: (no aliases) | a building or part of a building for storage of wares or goods. **Definition reference**: *(no definition references)* | "15" |  |
| "factory" Alias: (no aliases) | a building or buildings with equipment for manufacturing a workshop. **Definition reference**: *(no definition references)* | "16" |  |
| "power station" Alias: (no aliases) | a stationary plant containing apparatus for large scale conversion of some form of energy (such as hydraulic, steam, chemical or nuclear energy) into electrical energy. **Definition reference**: *(no definition references)* | "17" |  |
| "administrative" Alias: (no aliases) | a building for the management of affairs. **Definition reference**: *(no definition references)* | "18" |  |
| "educational facility" Alias: (no aliases) | a building concerned with education (e.g. school, college, university, etc.) **Definition reference**: *(no definition references)* | "19" |  |
| "church" Alias: (no aliases) | a building for public Christian worship. **Definition reference**: *(no definition references)* | "20" |  |
| "chapel" Alias: (no aliases) | a place for Christian worship other than a parish, cathedral or church, especially one attached to a private house or institution. **Definition reference**: *(no definition references)* | "21" |  |
| "temple" Alias: (no aliases) | a building for public Jewish worship. **Definition reference**: *(no definition references)* | "22" |  |
| "pagoda" Alias: (no aliases) | a Hindu or Buddhist temple or sacred building. **Definition reference**: *(no definition references)* | "23" |  |
| "shinto shrine" Alias: (no aliases) | a building for public Shinto worship. **Definition reference**: *(no definition references)* | "24" |  |
| "buddhist temple" Alias: (no aliases) | see pagoda. **Definition reference**: *(no definition references)* | "25" |  |
| "mosque" Alias: (no aliases) | a Muslim place of worship. **Definition reference**: *(no definition references)* | "26" |  |
| "marabout" Alias: (no aliases) | a shrine marking the burial place of a Muslim holy man. **Definition reference**: *(no definition references)* | "27" |  |
| "lookout" Alias: (no aliases) | keeping a watch upon events at sea or along the coast. **Definition reference**: *(no definition references)* | "28" |  |
| "communication" Alias: (no aliases) | transmitting and/or receiving electronic communication signals. **Definition reference**: *(no definition references)* | "29" |  |
| "television" Alias: (no aliases) | broadcast of television signals. **Definition reference**: *(no definition references)* | "30" |  |
| "radio" Alias: (no aliases) | broadcast of radio signals. **Definition reference**: *(no definition references)* | "31" |  |
| "radar" Alias: (no aliases) | a method, system or technique of using beamed, reflected, and timed radio waves for detecting, locating, or tracking objects, and for measuring altitudes. **Definition reference**: *(no definition references)* | "32" |  |
| "light support" Alias: (no aliases) | supporting a light **Definition reference**: *(no definition references)* | "33" |  |
| "microwave" Alias: (no aliases) | broadcasting and receiving signals using microwaves. **Definition reference**: *(no definition references)* | "34" |  |
| "cooling" Alias: (no aliases) | dissipating heat. **Definition reference**: *(no definition references)* | "35" |  |
| "observation" Alias: (no aliases) | a place from which the surroundings can be observed but at which a watch is not habitually maintained. **Definition reference**: *(no definition references)* | "36" |  |
| "time ball" Alias: (no aliases) | a visual time signal in form of a ball **Definition reference**: *(no definition references)* | "37" |  |
| "clock" Alias: (no aliases) | visual time signal. **Definition reference**: *(no definition references)* | "38" |  |
| "control" Alias: (no aliases) | used to control the flow of air, rail, or marine traffic. **Definition reference**: *(no definition references)* | "39" |  |
| "airship mooring" Alias: (no aliases) | a facility to secure an airship. **Definition reference**: *(no definition references)* | "40" |  |
| "stadium" Alias: (no aliases) | a large usually unroofed building with tiers of seats for spectators **Definition reference**: *(no definition references)* | "41" |  |
| "bus station" Alias: (no aliases) | a location at which buses arrive and from which they depart. **Definition reference**: *(no definition references)* | "42" |  |
| "passenger terminal building" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "43" |  |
| "sea rescue control" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "44" |  |
| "observatory" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "45" |  |
| "ore crusher" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "46" |  |
| "boathouse" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "47" |  |
| "pumping station" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "48" |  |

## 3.30 Height (HEIGHT)

Name: **Height** Code (registry camel case): "height"

IHO Definition: The value of the vertical distance to the highest point of the object, measured from a specified vertical datum.

**Definition reference**: *(no definition references)*

Alias: HEIGHT

Remarks: Height must not be used for floating objects. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.31 Horizontal accuracy (HORACC)

Name: **Horizontal accuracy** Code (registry camel case): "horizontalAccuracy"

IHO Definition: The best estimate of the horizontal accuracy of horizontal clearance and distances.

**Definition reference**: *(no definition references)*

Alias: HORACC

Remarks: The expected input is the radius of the two-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.32 Horizontal length (HORLEN)

Name: **Horizontal length** Code (registry camel case): "horizontalLength"

IHO Definition: A measurement of the longer of two linear axis.

**Definition reference**: *(no definition references)*

Alias: HORLEN

Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.33 Horizontal width (HORWID)

Name: **Horizontal width** Code (registry camel case): "horizontalWidth"

IHO Definition: A measurement of the shorter of two linear axis.

**Definition reference**: *(no definition references)*

Alias: HORWID

Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.34 ID Code (*no alias*)

Name: **ID Code** Code (registry camel case): "idcode"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.35 Information (*no alias*)

Name: **Information** Code (registry camel case): "information"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.36 Information in national language (NINFOM)

Name: **Information in national language** Code (registry camel case): "informationInNationalLanguage"

IHO Definition: Textual information in national language characters

**Definition reference**: *(no definition references)*

Alias: NINFOM

Remarks: The attribute 'information in national language' encodes any textual information about an object using a specified national language. The textual information could be, for example, a list, a table or a text. This attribute should be used, for example, to hold the information that is shown on paper charts by cautionary and explanatory notes.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.37 Inspection frequency (*no alias*)

Name: **Inspection frequency** Code (registry camel case): "inspectionFrequency"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.38 Inspection requirements (*no alias*)

Name: **Inspection requirements** Code (registry camel case): "inspectionRequirements"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.39 Installation date (*no alias*)

Name: **Installation date** Code (registry camel case): "installationDate"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.40 Light characteristic (LITCHR)

Name: **Light characteristic** Code (registry camel case): "lightCharacteristic"

IHO Definition: The typical behaviour associated with the light

**Definition reference**: *(no definition references)*

Alias: LITCHR

Remarks: A selection of the above characteristics is defined and illustrated diagrammatically in IHO Chart Specifications, M-4, 471.2.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "fixed" Alias: (no aliases) | a signal light that shows continuously, in any given direction, with constant luminous intensity and colour. **Definition reference**: *(no definition references)* | "1" |  |
| "flashing" Alias: (no aliases) | a rhythmic light in which the total duration of light in a period is clearly shorter than the total duration of darkness and all the appearances of light are of equal duration. **Definition reference**: *(no definition references)* | "2" |  |
| "long-flashing" Alias: (no aliases) | a flashing light in which a single flash of not less than two seconds duration is regularly repeated. **Definition reference**: *(no definition references)* | "3" |  |
| "quick-flashing" Alias: (no aliases) | a light exhibiting without interruption very rapid regular alternations of light and darkness. **Definition reference**: *(no definition references)* | "4" |  |
| "very quick flashing" Alias: (no aliases) | a flashing light in which flashes are repeated at a rate of not less than 80 flashes per minute but less than 160 flashes per minute. **Definition reference**: *(no definition references)* | "5" |  |
| "ultra quick flashing" Alias: (no aliases) | a flashing light in which flashes are repeated at a rate of not less than 160 flashes per minute. **Definition reference**: *(no definition references)* | "6" |  |
| "isophased" Alias: (no aliases) | a light with all durations of light and darkness equal. **Definition reference**: *(no definition references)* | "7" |  |
| "occulting" Alias: (no aliases) | a rhythmic light in which the total duration of light in a period is clearly longer than the total duration of darkness and all the eclipses are of equal duration. **Definition reference**: *(no definition references)* | "8" |  |
| "interrupted quick flashing" Alias: (no aliases) | a quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration. **Definition reference**: *(no definition references)* | "9" |  |
| "interrupted very quick flashing" Alias: (no aliases) | a light in which the very rapid alterations of light and darkness are interrupted at regular intervals by eclipses of long duration. **Definition reference**: *(no definition references)* | "10" |  |
| "interrupted ultra quick flashing" Alias: (no aliases) | a light in which the ultra quick flashes (160 or more per minute) are interrupted at regular intervals by eclipses of long duration. **Definition reference**: *(no definition references)* | "11" |  |
| "morse" Alias: (no aliases) | a rhythmic light in which appearances of light of two clearly different durations are grouped to represent a character or characters in the Morse code. **Definition reference**: *(no definition references)* | "12" |  |
| "fixed and flash" Alias: (no aliases) | a rhythmic light in which a fixed light is combined with a flashing light of higher luminous intensity. **Definition reference**: *(no definition references)* | "13" |  |
| "flash and long-flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "14" |  |
| "occulting and flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "15" |  |
| "fixed and long-flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "16" |  |
| "occulting alternating" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "17" |  |
| "long-flash alternating" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "18" |  |
| "flash alternating" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "19" |  |
| "quick-flash plus long-flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "25" |  |
| "very quick-flash plus long-flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "26" |  |
| "ultra quick-flash plus long-flash" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "27" |  |
| "alternating" Alias: (no aliases) | a signal light that shows, in any given direction, two or more colours in a regularly repeated sequence with a regular periodicity. **Definition reference**: *(no definition references)* | "28" |  |
| "fixed and alternating flashing" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "29" |  |

## 3.41 Light visibility (LITVIS)

Name: **Light visibility** Code (registry camel case): "lightVisibility"

IHO Definition: The specific visibility of a light, with respect to the light's intensity and ease of recognition.

**Definition reference**: *(no definition references)*

Alias: LITVIS

Remarks: "light visibility" encodes the specific visibility of a light, with respect to the light's intensity and ease of recognition.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "high intensity" Alias: (no aliases) | non-marine lights with a higher power than marine lights and visible from well off shore (often 'Aero' lights). **Definition reference**: *(no definition references)* | "1" |  |
| "low intensity" Alias: (no aliases) | non-marine lights with lower power than marine lights. **Definition reference**: *(no definition references)* | "2" |  |
| "faint" Alias: (no aliases) | a decrease in the apparent intensity of a light which may occur in the case of partial obstructions. **Definition reference**: *(no definition references)* | "3" |  |
| "intensified" Alias: (no aliases) | a light in a sector is intensified (i.e. has longer range than other sectors). **Definition reference**: *(no definition references)* | "4" |  |
| "unintensified" Alias: (no aliases) | a light in a sector is unintensified (i.e. has shorter range than other sectors). **Definition reference**: *(no definition references)* | "5" |  |
| "visibility deliberately restricted" Alias: (no aliases) | a light sector is deliberately reduced in intensity, for example to reduce its effect on a built-up area. **Definition reference**: *(no definition references)* | "6" |  |
| "obscured" Alias: (no aliases) | said of the arc of a light sector designated by its limiting bearings in which the light is not visible from seaward. **Definition reference**: *(no definition references)* | "7" |  |
| "partially obscured" Alias: (no aliases) | this value specifies that parts of the sector are obscured. **Definition reference**: *(no definition references)* | "8" |  |
| "visible in line of range" Alias: (no aliases) | lights that must be in line to be visible. **Definition reference**: *(no definition references)* | "9" |  |

## 3.42 Manned structure (*no alias*)

Name: **Manned structure** Code (registry camel case): "mannedStructure"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *boolean* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.43 Marks navigational - System of (MARSYS)

Name: **Marks navigational - System of** Code (registry camel case): "marksNavigationalSystemOf"

IHO Definition: The system of navigational buoyage a region complies with.

**Definition reference**: *(no definition references)*

Alias: MARSYS

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "IALA A" Alias: (no aliases) | navigational aids conform to the International Association of Lighthouse Authorities - IALA A system. **Definition reference**: *(no definition references)* | "1" |  |
| "IALA B" Alias: (no aliases) | navigational aids conform to the International Association of Lighthouse Authorities - IALA B system. **Definition reference**: *(no definition references)* | "2" |  |
| "no system" Alias: (no aliases) | navigational aids do not conform to any defined system. **Definition reference**: *(no definition references)* | "9" |  |
| "other system" Alias: (no aliases) | navigational aids conform to a defined system other than International Association of Lighthouse Authorities -IALA. **Definition reference**: *(no definition references)* | "10" |  |
| "CEVNI" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "11" |  |

## 3.44 Multiplicity of lights (MLTYLT)

Name: **Multiplicity of lights** Code (registry camel case): "multiplicityOfLights"

IHO Definition: The number of lights of identical character that exist as a co-located group.

**Definition reference**: *(no definition references)*

Alias: MLTYLT

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *integer* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.45 Nature of construction (NATCON)

Name: **Nature of construction** Code (registry camel case): "natureOfConstruction"

IHO Definition: The buildings primary construction material

**Definition reference**: *(no definition references)*

Alias: NATCON

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "masonry" Alias: (no aliases) | constructed of brick or stone. **Definition reference**: *(no definition references)* | "1" |  |
| "concreted" Alias: (no aliases) | constructed of concrete, a material made of sand and gravel that is united by cement into a hardened mass used for roads, foundations, etc. **Definition reference**: *(no definition references)* | "2" |  |
| "loose boulders" Alias: (no aliases) | constructed from large stones or blocks of concrete, often placed loosely for protection against waves or water turbulence. **Definition reference**: *(no definition references)* | "3" |  |
| "hard surface" Alias: (no aliases) | constructed with a surface of hard material, usually a term applied to roads surfaced with asphalt or concrete. **Definition reference**: *(no definition references)* | "4" |  |
| "unsurfaced" Alias: (no aliases) | constructed with no extra protection, usually a term applied to roads not surfaced with a hard material. **Definition reference**: *(no definition references)* | "5" |  |
| "wooden" Alias: (no aliases) | constructed from wood. **Definition reference**: *(no definition references)* | "6" |  |
| "metal" Alias: (no aliases) | constructed from metal. **Definition reference**: *(no definition references)* | "7" |  |
| "glass reinforced plastic (GRP)" Alias: (no aliases) | constructed from a plastic material strengthened with fibres of glass. **Definition reference**: *(no definition references)* | "8" |  |
| "painted" Alias: (no aliases) | the application of paint to some other construction or natural feature. **Definition reference**: *(no definition references)* | "9" |  |
| "latticed" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "11" |  |
| "glass" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "12" |  |

## 3.46 Object name (OBJNAM)

Name: **Object name** Code (registry camel case): "objectName"

IHO Definition: The individual name of an object.

**Definition reference**: *(no definition references)*

Alias: OBJNAM

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.47 Object name in national language (NOBJNM)

Name: **Object name in national language** Code (registry camel case): "objectNameInNationalLanguage"

IHO Definition: Name of object in national language characters.

**Definition reference**: *(no definition references)*

Alias: NOBJNM

Remarks: The attribute 'object name in national language' encodes the individual name of an object in the specified national language.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.48 Orientation value (*no alias*)

Name: **Orientation value** Code (registry camel case): "orientationValue"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.49 Periodic date end (PEREND)

Name: **Periodic date end** Code (registry camel case): "periodicDateEnd"

IHO Definition: The end of the active period for a seasonal object (e.g., a buoy).

**Definition reference**: *(no definition references)*

Alias: PEREND

Remarks: See also 'date end' (DATEND).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.50 Periodic date start (PERSTA)

Name: **Periodic date start** Code (registry camel case): "periodicDateStart"

IHO Definition: The start of the active period for a seasonal object (e.g., a buoy).

**Definition reference**: *(no definition references)*

Alias: PERSTA

Remarks: See also 'date start' (DATSTA).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.51 Pictorial representation (PICREP)

Name: **Pictorial representation** Code (registry camel case): "pictorialRepresentation"

IHO Definition: Indicates whether a pictorial representation of the object is available.

**Definition reference**: *(no definition references)*

Alias: PICREP

Remarks: The 'pictorial representation' could be a drawing or a photo. The string encodes the file name of an external graphic file (pixel/vector).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.52 Product (PRODCT)

Name: **Product** Code (registry camel case): "product"

IHO Definition: The various substances which are transported, stored or exploited.

**Definition reference**: *(no definition references)*

Alias: PRODCT

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "oil" Alias: (no aliases) | a thick, slippery liquid that will not dissolve in water, usually petroleum based in the context of storage tanks. **Definition reference**: *(no definition references)* | "1" |  |
| "gas" Alias: (no aliases) | a substance with particles that can move freely, usually a fuel substance in the context of storage tanks. **Definition reference**: *(no definition references)* | "2" |  |
| "water" Alias: (no aliases) | a colourless, odourless, tasteless liquid that is a compound of hydrogen and oxygen. **Definition reference**: *(no definition references)* | "3" |  |
| "stone" Alias: (no aliases) | a general term for rock fragments. **Definition reference**: *(no definition references)* | "4" |  |
| "coal" Alias: (no aliases) | a hard black mineral that is burned as fuel. **Definition reference**: *(no definition references)* | "5" |  |
| "ore" Alias: (no aliases) | a solid rock or mineral from which metal is obtained. **Definition reference**: *(no definition references)* | "6" |  |
| "chemicals" Alias: (no aliases) | any substance obtained by or used in a chemical process. **Definition reference**: *(no definition references)* | "7" |  |
| "drinking water" Alias: (no aliases) | water that is suitable for human consumption. **Definition reference**: *(no definition references)* | "8" |  |
| "milk" Alias: (no aliases) | a white fluid secreted by female mammals as food for their young. **Definition reference**: *(no definition references)* | "9" |  |
| "bauxite" Alias: (no aliases) | a mineral from which aluminum is obtained. **Definition reference**: *(no definition references)* | "10" |  |
| "coke" Alias: (no aliases) | a solid substance obtained after gas and tar have been extracted from coal, used as a fuel. **Definition reference**: *(no definition references)* | "11" |  |
| "iron ingots" Alias: (no aliases) | an oblong lump of cast iron metal. **Definition reference**: *(no definition references)* | "12" |  |
| "salt" Alias: (no aliases) | sodium chloride obtained from mines or by the evaporation of sea water. **Definition reference**: *(no definition references)* | "13" |  |
| "sand" Alias: (no aliases) | tiny grains of crushed or worn rock. **Definition reference**: *(no definition references)* | "14" |  |
| "timber" Alias: (no aliases) | wood prepared for use in building or carpentry. **Definition reference**: *(no definition references)* | "15" |  |
| "sawdust/wood chips" Alias: (no aliases) | powdery fragments of wood made in sawing timber or coarse chips produced for use in manufacturing pressed board. **Definition reference**: *(no definition references)* | "16" |  |
| "scrap metal" Alias: (no aliases) | discarded metal suitable for being reprocessed. **Definition reference**: *(no definition references)* | "17" |  |
| "liquified natural gas (LNG)" Alias: (no aliases) | a compressed gas consisting of flammable light hydrocarbons and derived from natural gas. **Definition reference**: *(no definition references)* | "18" |  |
| "liquified petroleum gas (LPG)" Alias: (no aliases) | a compressed gas consisting of flammable light hydrocarbons and derived from petroleum. **Definition reference**: *(no definition references)* | "19" |  |
| "wine" Alias: (no aliases) | the fermanted juice of grapes. **Definition reference**: *(no definition references)* | "20" |  |
| "cement" Alias: (no aliases) | a substance made of powdered lime and clay, mixed with water. **Definition reference**: *(no definition references)* | "21" |  |
| "grain" Alias: (no aliases) | a small hard seed, especially that of any cereal plant such as wheat, rice, corn, rye etc. **Definition reference**: *(no definition references)* | "22" |  |
| "electricity" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "23" |  |
| "ice" Alias: (no aliases) | frozen water. **Definition reference**: *(no definition references)* | "24" |  |
| "clay" Alias: (no aliases) | (particles of less than 0.002mm); stiff, sticky earth that becomes hard when baked. **Definition reference**: *(no definition references)* | "25" |  |

## 3.53 Quality of sounding measurement (QUASOU)

Name: **Quality of sounding measurement** Code (registry camel case): "qualityOfSoundingMeasurement"

IHO Definition: The reliability of the value of a sounding.

**Definition reference**: *(no definition references)*

Alias: QUASOU

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "depth known" Alias: (no aliases) | the depth from chart datum to the bottom is a known value. **Definition reference**: *(no definition references)* | "1" |  |
| "depth or least depth unknown" Alias: (no aliases) | the depth from chart datum to the bottom is unknown. **Definition reference**: *(no definition references)* | "2" |  |
| "doubtful sounding" Alias: (no aliases) | a depth that may be less than indicated. **Definition reference**: *(no definition references)* | "3" |  |
| "unreliable sounding" Alias: (no aliases) | a depth that is considered to be an unreliable value. **Definition reference**: *(no definition references)* | "4" |  |
| "no bottom found at value shown" Alias: (no aliases) | upon investigation the bottom was not found at this depth. **Definition reference**: *(no definition references)* | "5" |  |
| "least depth known" Alias: (no aliases) | the shoalest depth over a feature is of known value. **Definition reference**: *(no definition references)* | "6" |  |
| "least depth unknown, safe clearance at depth shown" Alias: (no aliases) | the least depth over a feature is unknown, but there is considered to be safe clearance at this depth. **Definition reference**: *(no definition references)* | "7" |  |
| "value reported (not surveyed)" Alias: (no aliases) | depth value obtained from a report, but not fully surveyed. **Definition reference**: *(no definition references)* | "8" |  |
| "value reported (not confirmed)" Alias: (no aliases) | depth value obtained from a report, which it has not been possible to confirm. **Definition reference**: *(no definition references)* | "9" |  |
| "maintained depth" Alias: (no aliases) | the depth at which a channel is kept by human influence, usually by dredging. **Definition reference**: *(no definition references)* | "10" |  |
| "not regularly maintained" Alias: (no aliases) | depths may be altered by human influence, but will not be routinely maintained. **Definition reference**: *(no definition references)* | "11" |  |

## 3.54 Radar conspicuous (*no alias*)

Name: **Radar conspicuous** Code (registry camel case): "radarConspicuous"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *boolean* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.55 Radar wave length (RADWAL)

Name: **Radar wave length** Code (registry camel case): "radarWaveLength"

IHO Definition: The distance between two successive peaks (or other points of identical phase) on an electromagnetic wave in the radar band of the electromagnetic spectrum.

**Definition reference**: *(no definition references)*

Alias: RADWAL

Remarks: The attribute 'radar transponder beacon wavelength' encodes the specific wavelength at which a radar transponder beacon transmits. Radar transponder beacons generally work on the following wavelengths: 3cm (X) Band, 10cm (S) Band. Nevertheless, wavelengths outside the marine band are used.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.56 Remote monitoring system (*no alias*)

Name: **Remote monitoring system** Code (registry camel case): "remoteMonitoringSystem"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.57 Remotly monitored (*no alias*)

Name: **Remotly monitored** Code (registry camel case): "remotlyMonitored"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.58 Scale minimum (SCAMIN)

Name: **Scale minimum** Code (registry camel case): "scaleMinimum"

IHO Definition: The minimum scale at which the object may be used, e.g., for ECDIS presentation.

**Definition reference**: *(no definition references)*

Alias: SCAMIN

Remarks: The modulus of the scale is indicated, that is 1:1 250 000 is encoded as 1250000.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *integer* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.59 Sector limit one (SECTR1)

Name: **Sector limit one** Code (registry camel case): "sectorLimitOne"

IHO Definition: The sector limit 1 specifies the first limit of the sector. The order of sector limit 1 and sector limit 2 is clockwise around the central object (e.g., a light).

**Definition reference**: *(no definition references)*

Alias: SECTR1

Remarks: A sector is the part of a circle between two straight lines drawn from the centre to the circumference (Advanced Learner's Dictionary, 2nd Edition). The values given to the common limits of adjacent sectors should be identical. The orientation of bearing is from seaward to the central object. This conforms with the method used in 'List of Lights' publications. A generic term such as 'to shore' cannot be used; a specific bearing must be encoded. Where a light sector limit is defined as 'to the shore', it should be encoded using a value that ensures that, when the limit is drawn, it will fall entirely on land.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.60 Sector limit two (SECTR2)

Name: **Sector limit two** Code (registry camel case): "sectorLimitTwo"

IHO Definition: The sector limit 2 specifies the second limit of the sector. The order of sector limit 1 and sector limit 2 is clockwise around the central object (e.g., a light).

**Definition reference**: *(no definition references)*

Alias: SECTR2

Remarks: A sector is the part of a circle between two straight lines drawn from the centre to the circumference (Advanced Learner's Dictionary, 2nd Edition). The values given to the common limits of adjacent sectors should be identical. The orientation of bearing is from seaward to the central object. This to the method used in 'List of Lights' publications. A generic term such as 'to shore' cannot be used; a specific bearing must be encoded. Where a light sector limit is defined as 'to the shore', it should be encoded using a value that ensures that, when the limit is drawn, it will fall entirely on land.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.61 Signal frequency (SIGFRQ)

Name: **Signal frequency** Code (registry camel case): "signalFrequency"

IHO Definition: The frequency of a signal.

**Definition reference**: *(no definition references)*

Alias: SIGFRQ

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *integer* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.62 Signal generation (SIGGEN)

Name: **Signal generation** Code (registry camel case): "signalGeneration"

IHO Definition: The mechanism used to generate a fog signal.

**Definition reference**: *(no definition references)*

Alias: SIGGEN

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "automatically" Alias: (no aliases) | signal generation is initiated by a self regulating mechanism such as a timer or light sensor. **Definition reference**: *(no definition references)* | "1" |  |
| "by wave action" Alias: (no aliases) | the signal is generated by the motion of the sea surface such as a bell in a buoy. **Definition reference**: *(no definition references)* | "2" |  |
| "by hand" Alias: (no aliases) | the signal is generated by a manually operated mechanism such as a hand cranked siren. **Definition reference**: *(no definition references)* | "3" |  |
| "by wind" Alias: (no aliases) | the signal is generated by the motion of air such as a wind driven whistle. **Definition reference**: *(no definition references)* | "4" |  |

## 3.63 Signal group (SIGGRP)

Name: **Signal group** Code (registry camel case): "signalGroup"

IHO Definition: The number of signals, the combination of signals or the morse character(s) within one period of full sequence.

**Definition reference**: *(no definition references)*

Alias: SIGGRP

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.64 Signal output (*no alias*)

Name: **Signal output** Code (registry camel case): "signalOutput"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.65 Signal period (SIGPER)

Name: **Signal period** Code (registry camel case): "signalPeriod"

IHO Definition: The time occupied by an entire cycle of intervals of light and eclipse.

**Definition reference**: *(no definition references)*

Alias: SIGPER

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.66 Signal sequence (SIGSEQ)

Name: **Signal sequence** Code (registry camel case): "signalSequence"

IHO Definition: The sequence of times occupied by intervals of light and eclipse for all 'light characteristics' except for occulting where the sequence of times is occupied by intervals of eclipse and light.

**Definition reference**: *(no definition references)*

Alias: SIGSEQ

Remarks: The 'signal sequence' for all 'light characteristics' except for occulting is indicated using a fixed format to encode the value of intervals of light (L) and eclipse (E).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.67 Sounding uncertainty (SOUACC)

Name: **Sounding uncertainty** Code (registry camel case): "soundingUncertainty"

IHO Definition: The best estimate of the accuracy of the sounding data. The maximum of the one-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.

**Definition reference**: *(no definition references)*

Alias: SOUACC

Remarks: The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.68 Source date (SORDAT)

Name: **Source date** Code (registry camel case): "sourceDate"

IHO Definition: The production date of the source, e.g., the date of measurement.

**Definition reference**: *(no definition references)*

Alias: SORDAT

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.69 Source indication (SORIND)

Name: **Source indication** Code (registry camel case): "sourceIndication"

IHO Definition: Information about the source of the object.

**Definition reference**: *(no definition references)*

Alias: SORIND

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.70 Status (STATUS)

Name: **Status** Code (registry camel case): "status"

IHO Definition: The condition of an object at a given instant in time

**Definition reference**: *(no definition references)*

Alias: STATUS

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "permanent" Alias: (no aliases) | intended to last or function indefinitely. **Definition reference**: *(no definition references)* | "1" |  |
| "occasional" Alias: (no aliases) | acting on special occasions happening irregularly. **Definition reference**: *(no definition references)* | "2" |  |
| "recommended" Alias: (no aliases) | presented as worthy of confidence, acceptance, use, etc. **Definition reference**: *(no definition references)* | "3" |  |
| "not in use" Alias: (no aliases) | no longer used for the purpose intended disused. **Definition reference**: *(no definition references)* | "4" |  |
| "periodic/intermittent" Alias: (no aliases) | recurring at intervals. **Definition reference**: *(no definition references)* | "5" |  |
| "reserved" Alias: (no aliases) | set apart for some specific use. **Definition reference**: *(no definition references)* | "6" |  |
| "temporary" Alias: (no aliases) | meant to last only for a time. **Definition reference**: *(no definition references)* | "7" |  |
| "private" Alias: (no aliases) | not in public ownership or operation. **Definition reference**: *(no definition references)* | "8" |  |
| "mandatory" Alias: (no aliases) | compulsory enforced. **Definition reference**: *(no definition references)* | "9" |  |
| "extinguished" Alias: (no aliases) | no longer lit **Definition reference**: *(no definition references)* | "11" |  |
| "illuminated" Alias: (no aliases) | lit by floodlights, strip lights, etc. **Definition reference**: *(no definition references)* | "12" |  |
| "historic" Alias: (no aliases) | famous in history of historical interest. **Definition reference**: *(no definition references)* | "13" |  |
| "public" Alias: (no aliases) | belonging to, available to, used or shared by, the community as a whole and not restricted to private use. **Definition reference**: *(no definition references)* | "14" |  |
| "synchronized" Alias: (no aliases) | occur at a time, coincide in point of time, be contemporary or simultaneous. **Definition reference**: *(no definition references)* | "15" |  |
| "watched" Alias: (no aliases) | looked at or observed over a period of time especially so as to be aware of any movement or change. **Definition reference**: *(no definition references)* | "16" |  |
| "un-watched" Alias: (no aliases) | usually automatic in operation, without any permanently-stationed personnel to superintend it. **Definition reference**: *(no definition references)* | "17" |  |
| "existence doubtful" Alias: (no aliases) | an object that has been reported but has not been definitely determined to exist. **Definition reference**: *(no definition references)* | "18" |  |
| "buoyed" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "28" |  |

## 3.71 Technique of sounding measurement (TECSOU)

Name: **Technique of sounding measurement** Code (registry camel case): "techniqueOfSoundingMeasurement"

IHO Definition: Survey method used to obtain depth information

**Definition reference**: *(no definition references)*

Alias: TECSOU

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "found by echo-sounder" Alias: (no aliases) | the depth was determined by using an instrument that determines depth of water by measuring the time interval between emission of a sonic or ultrasonic signal and return of its echo from the bottom. **Definition reference**: *(no definition references)* | "1" |  |
| "found by side-scan-sonar" Alias: (no aliases) | the depth was computed from a record produced by active sonar in which fixed acoustic beams are directed into the water perpendicularly to the direction of travel to scan the bottom and generate a record of the bottom configuration. **Definition reference**: *(no definition references)* | "2" |  |
| "found by multi-beam" Alias: (no aliases) | the depth was determined by using a wide swath echo sounder that uses multiple beams to measure depths directly below and transverse to the ship's track. **Definition reference**: *(no definition references)* | "3" |  |
| "found by diver" Alias: (no aliases) | the depth was determined by a person skilled in the practice of diving. **Definition reference**: *(no definition references)* | "4" |  |
| "found by lead-line" Alias: (no aliases) | the depth was determined by using a line, graduated with attached marks and fastened to a sounding lead. **Definition reference**: *(no definition references)* | "5" |  |
| "swept by wire-drag" Alias: (no aliases) | the given area was determined to be free from navigational dangers to a certain depth by towing a buoyed wire at the desired depth by two launches, or a least depth was identified using the same technique. **Definition reference**: *(no definition references)* | "6" |  |
| "found by laser" Alias: (no aliases) | the depth was determined by using an instrument that measures distance by emitting timed pulses of laser light and measuring the time between emission and reception of the reflected pulses. **Definition reference**: *(no definition references)* | "7" |  |
| "swept by vertical acoustic system" Alias: (no aliases) | the given area has been swept using a system comprised of multiple echo sounder transducers attached to booms deployed from the survey vessel. **Definition reference**: *(no definition references)* | "8" |  |
| "found by electromagnetic sensor" Alias: (no aliases) | the depth was determined by using an instrument that compares electromagnetic signals. **Definition reference**: *(no definition references)* | "9" |  |
| "photogrammetry" Alias: (no aliases) | the depth was determined by applying mathematical techniques to photographs. **Definition reference**: *(no definition references)* | "10" |  |
| "satellite imagery" Alias: (no aliases) | the depth was determined by using instruments placed aboard an artificial satellite. **Definition reference**: *(no definition references)* | "11" |  |
| "found by levelling" Alias: (no aliases) | the depth was determined by using levelling techniques to find the elevation of the point relative to a datum. **Definition reference**: *(no definition references)* | "12" |  |
| "swept by side-scan-sonar" Alias: (no aliases) | the given area was determined to be free from navigational dangers to a certain depth by towing a side-scan-sonar. **Definition reference**: *(no definition references)* | "13" |  |
| "computer generated" Alias: (no aliases) | the sounding was determined from a bottom model constructed using a computer. **Definition reference**: *(no definition references)* | "14" |  |

## 3.72 Textual description (*no alias*)

Name: **Textual description** Code (registry camel case): "textualDescription"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.73 Textual description in national language (NTXTDS)

Name: **Textual description in national language** Code (registry camel case): "textualDescriptionInNationalLanguage"

IHO Definition: The file name of an external text file that contains the text in a national language.

**Definition reference**: *(no definition references)*

Alias: NTXTDS

Remarks: The attribute 'textual description in national language' indicates whether a text file containing text extracted from relevant pilot books or navigational publications is available.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.74 Topmark/daymark shape (TOPSHP)

Name: **Topmark/daymark shape** Code (registry camel case): "topmarkDaymarkShape"

IHO Definition: The shape a topmark or day mark exhibits

**Definition reference**: *(no definition references)*

Alias: TOPSHP

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "cone, point up" Alias: (no aliases) | is where the vertex points up. A cone is a solid figure generated by straight lines drawn from a fixed point (the vertex) to a circle in a plane not containing the vertex. Cones are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. **Definition reference**: *(no definition references)* | "1" |  |
| "cone, point down" Alias: (no aliases) | is where the vertex points down. A cone is a solid figure generated by straight lines drawn from a fixed point (the vertex) to a circle in a plane not containing the vertex. Cones are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. **Definition reference**: *(no definition references)* | "2" |  |
| "sphere" Alias: (no aliases) | a body the surface of which is at all points equidistant from the centre. Spheres are commonly used as International Association of Lighthouse Authorities - IALA topmarks safe water. **Definition reference**: *(no definition references)* | "3" |  |
| "2 spheres" Alias: (no aliases) | two black spheres are commonly used as an International Association of Lighthouse Authorities - IALA topmark (isolated danger). **Definition reference**: *(no definition references)* | "4" |  |
| "cylinder (can)" Alias: (no aliases) | a solid geometrical figure generated by straight lines fixed in direction and describing with one of point a closed curve, especially a circle (in which case the figure is circular cylinder, it's ends being parallel circles). Cylinders are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. **Definition reference**: *(no definition references)* | "5" |  |
| "board" Alias: (no aliases) | usually of rectangular shape, made from timber or metal and used to provide a contrast with the natural background of a daymark. The actual daymark is often painted on to this board. **Definition reference**: *(no definition references)* | "6" |  |
| "x-shape (St. Andrew's cross)" Alias: (no aliases) | having a shape or a cross-section like the capital letter X. An x-shape as an International Association of Lighthouse Authorities - IALA topmark should be 3 dimensional in shape. It is made of at least three crossed bars. **Definition reference**: *(no definition references)* | "7" |  |
| "upright cross (St. George's Cross)" Alias: (no aliases) | a cross with one vertical member and one horizontal member, i.e. similar in shape to the character '+'. **Definition reference**: *(no definition references)* | "8" |  |
| "cube, point up" Alias: (no aliases) | a cube standing on one of its vertexes. A cube is a solid contained by six equal squares a regular hexahedron (The New Shorter Oxford English Dictionary. 1993. vol 2) **Definition reference**: *(no definition references)* | "9" |  |
| "2 cones, point to point" Alias: (no aliases) | 2 cones, one above the other, with their vertices together in the centre. **Definition reference**: *(no definition references)* | "10" |  |
| "2 cones, base to base" Alias: (no aliases) | 2 cones, one above the other, with their bases together in the centre and their vertices pointing up and down. **Definition reference**: *(no definition references)* | "11" |  |
| "rhombus" Alias: (no aliases) | a plane figure having four equal sides and equal opposite angles (two acute and two obtuse) an oblique equilateral parallelogram. **Definition reference**: *(no definition references)* | "12" |  |
| "2 cones (points upward)" Alias: (no aliases) | 2 cones, one above the other, with their vertices pointing up. **Definition reference**: *(no definition references)* | "13" |  |
| "2 cones (points downward)" Alias: (no aliases) | 2 cones, one above the other, with their vertices pointing down. **Definition reference**: *(no definition references)* | "14" |  |
| "besom, point up (broom or perch)" Alias: (no aliases) | besom: a bundle of rods or twigs. perch: a staff placed on top of a buoy, rock or shoal as a mark for navigation. **Definition reference**: *(no definition references)* | "15" |  |
| "besom, point down (broom or perch)" Alias: (no aliases) | besom: a bundle of rods or twigs. perch: a staff placed on top of a buoy, rock or shoal as a mark for navigation. **Definition reference**: *(no definition references)* | "16" |  |
| "flag" Alias: (no aliases) | a flag mounted on a short pole. **Definition reference**: *(no definition references)* | "17" |  |
| "sphere over rhombus" Alias: (no aliases) | A sphere located above a rhombus. **Definition reference**: *(no definition references)* | "18" |  |
| "square" Alias: (no aliases) | a plane figure with four right angles and four equal straight sides **Definition reference**: *(no definition references)* | "19" |  |
| "rectangle, horizontal" Alias: (no aliases) | a rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length . A horizontal rectangle is where the two longer opposite sides are standing horizontally. **Definition reference**: *(no definition references)* | "20" |  |
| "rectangle, vertical" Alias: (no aliases) | a rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length. A vertical rectangle is where the two longer opposite sides are standing vertically. **Definition reference**: *(no definition references)* | "21" |  |
| "trapezium, up" Alias: (no aliases) | which stands on its longer parallel side. A trapezium is a quadrilateral having one pair of opposite sides parallel. **Definition reference**: *(no definition references)* | "22" |  |
| "trapezium, down" Alias: (no aliases) | which stands on its shorter parallel side. A trapezium is a quadrilateral having one pair of opposite sides parallel. **Definition reference**: *(no definition references)* | "23" |  |
| "triangle, point up" Alias: (no aliases) | A triangle, point up. A triangle is a figure having three angles and three sides. **Definition reference**: *(no definition references)* | "24" |  |
| "triangle, point down" Alias: (no aliases) | A triangle, point down. A triangle is a figure having three angles and three sides. **Definition reference**: *(no definition references)* | "25" |  |
| "circle" Alias: (no aliases) | a perfectly round plane figure whose circumference is everywhere equidistant from its centre. **Definition reference**: *(no definition references)* | "26" |  |
| "two upright crosses (one over the other)" Alias: (no aliases) | two upright crosses, generally vertically disposed one above the other. **Definition reference**: *(no definition references)* | "27" |  |
| "T-shape" Alias: (no aliases) | having a shape like the capital letter T. **Definition reference**: *(no definition references)* | "28" |  |
| "triangle pointing up over a circle" Alias: (no aliases) | a triangle, vertex uppermost, located above a circle. **Definition reference**: *(no definition references)* | "29" |  |
| "upright cross over a circle" Alias: (no aliases) | an upright cross located above a circle. **Definition reference**: *(no definition references)* | "30" |  |
| "rhombus over a circle" Alias: (no aliases) | a rhombus located above a circle. **Definition reference**: *(no definition references)* | "31" |  |
| "circle over a triangle pointing up" Alias: (no aliases) | a circle located over a triangle, vertex uppermost. **Definition reference**: *(no definition references)* | "32" |  |
| "other shape (see INFORM)" Alias: (no aliases) | *Definition required* **Definition reference**: *(no definition references)* | "33" |  |

## 3.75 Traffic flow (TRAFIC)

Name: **Traffic flow** Code (registry camel case): "trafficFlow"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: TRAFIC

Remarks: The direction of travel

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "inbound" Alias: (no aliases) | traffic flow in a general direction toward a port or similar destination. **Definition reference**: *(no definition references)* | "1" |  |
| "outbound" Alias: (no aliases) | traffic flow in a general direction away from a port or similar point of origin. **Definition reference**: *(no definition references)* | "2" |  |
| "one-way" Alias: (no aliases) | traffic flow in one general direction only. **Definition reference**: *(no definition references)* | "3" |  |
| "two-way" Alias: (no aliases) | traffic flow in two generally opposite directions. **Definition reference**: *(no definition references)* | "4" |  |

## 3.76 Type of battery (*no alias*)

Name: **Type of battery** Code (registry camel case): "typeOfBattery"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.77 Type of buoy (*no alias*)

Name: **Type of buoy** Code (registry camel case): "typeOfBuoy"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.78 Type of environment observation equipment (*no alias*)

Name: **Type of environment observation equipment** Code (registry camel case): "typeOfEnvironmentObservationEquipment"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.79 Type of light (*no alias*)

Name: **Type of light**  Code (registry camel case): "typeOfLight"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.80 Value of geographical range (*no alias*)

Name: **Value of geographical range** Code (registry camel case): "valueOfGeographicalRange"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.81 Value of luminous range (*no alias*)

Name: **Value of luminous range** Code (registry camel case): "valueOfLuminousRange"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *text* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.82 Value of maximum range (VALMXR)

Name: **Value of maximum range** Code (registry camel case): "valueOfMaximumRange"

IHO Definition: The extreme distance at which an object can be seen or a signal detected.

**Definition reference**: *(no definition references)*

Alias: VALMXR

Remarks: This attribute does not apply to lights where the attribute 'value of nominal range' should be used.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.83 Value of nominal range (VALNMR)

Name: **Value of nominal range** Code (registry camel case): "valueOfNominalRange"

IHO Definition: The nominal range at which an object can be seen or a signal detected.

**Definition reference**: *(no definition references)*

Alias: VALNMR

Remarks: The nominal range is normally the luminous range of a light in a homogeneous atmosphere in which the meteorological visibility is 10 sea miles (IHO Hydrographic Dictionary, S-32, 5th Edition, 4218).

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.84 Vertical datum (VERDAT)

Name: **Vertical datum** Code (registry camel case): "verticalDatum"

IHO Definition: Vertical datum used for measuring elevations of points on the earth's surface. Its the datum to which both heights and soundings are referred.

**Definition reference**: *(no definition references)*

Alias: VERDAT

Remarks: When the vertical datum is unknown, such as water areas above locks, the value 'local datum' is to be used, and further details may be encoded using 'INFORM'. The +0.3m approximation quoted in the 'approximate' levels is somehow arbitrary and follows the British example of their definition for 'approximate LAT'.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "mean low water springs" Alias: (no aliases) | (MLWS) - the average height of the low waters of spring tides. **Definition reference**: *(no definition references)* | "1" |  |
| "mean lower low water springs" Alias: (no aliases) | (MLLWS) - the average height of lower low water springs at a place. **Definition reference**: *(no definition references)* | "2" |  |
| "mean sea level" Alias: (no aliases) | (MSL) - the average height of the surface of the sea at a tide station for all stages of the tide over a 19-year period, usually determined from hourly height readings measured from a fixed predetermined reference level. **Definition reference**: *(no definition references)* | "3" |  |
| "lowest low water" Alias: (no aliases) | an arbitrary level conforming to the lowest tide observed at a place, or some what lower. **Definition reference**: *(no definition references)* | "4" |  |
| "mean low water" Alias: (no aliases) | (MLW) - the average height of all low waters at a place over a 19-year period. **Definition reference**: *(no definition references)* | "5" |  |
| "lowest low water springs" Alias: (no aliases) | an arbitrary level conforming to the lowest water level observed at a place at spring tides during a period of time shorter than 19 years. **Definition reference**: *(no definition references)* | "6" |  |
| "approximate mean low water springs" Alias: (no aliases) | an arbitrary level, usually within ' 0.3m from that of mean low water springs (MLWS). **Definition reference**: *(no definition references)* | "7" |  |
| "Indian spring low water" Alias: (no aliases) | (ISLW) - an arbitrary tidal datum approximating the level of the mean of the lower low water at spring tides. **Definition reference**: *(no definition references)* | "8" |  |
| "low water springs" Alias: (no aliases) | an arbitrary level, approximating that of mean low water springs (MLWS). **Definition reference**: *(no definition references)* | "9" |  |
| "approximate lowest astronomical tide" Alias: (no aliases) | an arbitrary level, usually within ' 0.3m from that of lowest astronomical tide (LAT). **Definition reference**: *(no definition references)* | "10" |  |
| "nearly lowest low water" Alias: (no aliases) | an arbitrary level approximating the lowest water level observed at a place, usually equivalent to the Indian spring low water (ISLW). **Definition reference**: *(no definition references)* | "11" |  |
| "mean lower low water" Alias: (no aliases) | (MLLW) - the average height of the lower low waters at a place over a 19-year period. **Definition reference**: *(no definition references)* | "12" |  |
| "low water" Alias: (no aliases) | an approximation of mean low water adopted as the reference level for a limited area, irrespective of better determinations at a later date. **Definition reference**: *(no definition references)* | "13" |  |
| "approximate mean low water" Alias: (no aliases) | an arbitrary level, usually within ' 0.3m from that of mean low water (MLW). **Definition reference**: *(no definition references)* | "14" |  |
| "approximate mean lower low water" Alias: (no aliases) | an arbitrary level, usually within ' 0.3m from that of mean lower low water (MLLW). **Definition reference**: *(no definition references)* | "15" |  |
| "mean high water" Alias: (no aliases) | (MHW) - the average height of all high waters at a place over a 19-year period. **Definition reference**: *(no definition references)* | "16" |  |
| "mean high water springs" Alias: (no aliases) | (MHWS) - the average height of the high waters of spring tides. **Definition reference**: *(no definition references)* | "17" |  |
| "high water" Alias: (no aliases) | the highest level reached at a place by the water surface in one tidal cycle. **Definition reference**: *(no definition references)* | "18" |  |
| "approximate mean sea level" Alias: (no aliases) | an arbitrary level, usually within ' 0.3m from that of mean sea level (MSL). **Definition reference**: *(no definition references)* | "19" |  |
| "high water springs" Alias: (no aliases) | an arbitrary level, approximating that of mean high water springs (MHWS). **Definition reference**: *(no definition references)* | "20" |  |
| "mean higher high water" Alias: (no aliases) | (MHHW) - the average height of higher high waters at a place over a 19-year period. **Definition reference**: *(no definition references)* | "21" |  |
| "equinoctial spring low water" Alias: (no aliases) | the level of low water springs near the time of an equinox. **Definition reference**: *(no definition references)* | "22" |  |
| "lowest astronomical tide" Alias: (no aliases) | (LAT) - the lowest tide level which can be predicted to occur under average meterological conditions and under any combination of astronomical conditions. **Definition reference**: *(no definition references)* | "23" |  |
| "local datum" Alias: (no aliases) | an arbitrary datum defined by a local harbour authority, from which levels and tidal heights are measured by this authority. **Definition reference**: *(no definition references)* | "24" |  |
| "international great lakes datum 1985" Alias: (no aliases) | (IGLD 1985) - a vertical reference system with its zero based on the mean water level at Rimouski/Pointe-au-P??re, Quebec, over the period 1970 to 1988. **Definition reference**: *(no definition references)* | "25" |  |
| "mean water level" Alias: (no aliases) | the average of all hourly water levels over the available period of record. **Definition reference**: *(no definition references)* | "26" |  |
| "lower low water large tide" Alias: (no aliases) | (LLWLT) - the average of the lowest low waters, one from each of 19 years of observations. **Definition reference**: *(no definition references)* | "27" |  |
| "higher high water large tide" Alias: (no aliases) | (HHWLT) - the average of the highest high waters, one from each of 19 years of observations. **Definition reference**: *(no definition references)* | "28" |  |
| "nearly highest high water" Alias: (no aliases) | an arbitrary level approximating the highest water level observed at a place, usually equivalent to the high water springs. **Definition reference**: *(no definition references)* | "29" |  |
| "highest astronomical tide (HAT)" Alias: (no aliases) | the highest tidal level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. **Definition reference**: *(no definition references)* | "30" |  |

## 3.85 Vertical length (VERLEN)

Name: **Vertical length** Code (registry camel case): "verticalLength"

IHO Definition: The total vertical length of an object.

**Definition reference**: *(no definition references)*

Alias: VERLEN

Remarks: For floating objects: the vertical distance from the surface of water to the highest point of that object. For fixed objects: the vertical distance from seabed or ground to the highest point of that object. For objects on top of other objects: the vertical distance from the lowest to the highest point of that object. Vertical length measurements do not require a datum. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.86 Vertical uncertainty (VERACC)

Name: **Vertical uncertainty** Code (registry camel case): "verticalUncertainty"

IHO Definition: The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances, excluding sounding measurements. The one-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.

**Definition reference**: *(no definition references)*

Alias: VERACC

Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *real* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:(no listed values)

## 3.87 Visually conspicuous (*no alias*)

Name: **Visually conspicuous** Code (registry camel case): "visuallyConspicuous"

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

| *Value type* | *UOM (unit of measure)* | *Quantity Specification* |
| --- | --- | --- |
| *enumeration* | *(none)* | *(none)* |

Constraints: (no constraints)

Listed Values:

| label | definition | code | remarks |
| --- | --- | --- | --- |
| "visually conspicuous" Alias: (no aliases) | term applied to an object either natural or artificial which is distinctly and notably visible from seaward. **Definition reference**: *(no definition references)* | "1" |  |
| "not visually conspicuous" Alias: (no aliases) | an object which is visible from seaward, but is not conspicuous. **Definition reference**: *(no definition references)* | "2" |  |
| "prominent" Alias: (no aliases) | an object which is visible from seaward and may be used as a fixing mark, but is not conspicuous. **Definition reference**: *(no definition references)* | "2" |  |

# 4 Complex Attributes

*(no complex attributes present)*

# 5 Roles

*(no roles present)*

# 6 Information Associations

*(no information associations present)*

# 7 Feature Associations

*(no feature associations present)*

# 8 Information Types

*(no information types present)*

# 9 Feature Types

## 9.1 Beacon, special purpose/general (BCNSPP)

Name: **Beacon, special purpose/general** Code (registry camel case): "BeaconSpecialPurpose/General"

|  |  |  |
| --- | --- | --- |
| isAbstract=false | superType=*(none)* | subType=*(none)* |

IHO Definition: A special purpose beacon is primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Sailing Directions or Notices to Mariners (UKHO NP 735, 5th Edition). Beacon in general: A beacon whose appearance or purpose is not adequately known.

**Definition reference**: *(no definition references)*

Alias: BCNSPP

Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfSpecialPurposeMark | enumeration | 1..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| textualDescription | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.2 Beacon, lateral (BCNLAT)

Name: **Beacon, lateral** Code (registry camel case): "BeaconLateral"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A lateral beacon is used to indicate the port or starboard hand side of the route to be followed. They are generally used for well defined channels and are used in conjunction with a conventional direction of buoyage.

**Definition reference**: *(no definition references)*

Alias: BCNLAT

Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfLateralMark | enumeration | 1..1 | 1 : port-hand lateral mark 2 : starboard-hand lateral mark 3 : preferred channel to starboard lateral mark 4 : preferred channel to port lateral mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.3 Beacon, cardinal (BCNCAR)

Name: **Beacon, cardinal** Code (registry camel case): "BeaconCardinal"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A cardinal beacon is used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West), bounded by inter-cardinal bearings from the point marked.

**Definition reference**: *(no definition references)*

Alias: BCNCAR

Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfCardinalMark | enumeration | 1..1 | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.4 Beacon, isolated danger (BCNISD)

Name: **Beacon, isolated danger** Code (registry camel case): "BeaconIsolatedDanger"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: An isolated danger beacon is a beacon erected on an isolated danger of limited extent, which has navigable water all around it.

**Definition reference**: *(no definition references)*

Alias: BCNISD

Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.5 Beacon, safe water (BCNSAW)

Name: **Beacon, safe water** Code (registry camel case): "BeaconSafeWater"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A safe water beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey.

**Definition reference**: *(no definition references)*

Alias: BCNSAW

Remarks: A safe water beacon may be used to indicate that there is navigable water around the mark. (UKHO NP 735, 5th Edition) Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfCardinalMark | enumeration | 1..\* | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 0..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.6 Buoy, installation (BOYINB)

Name: **Buoy, installation** Code (registry camel case): "BuoyInstallation"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: An installation buoy is a buoy used for loading tankers with gas or oil.

**Definition reference**: *(no definition references)*

Alias: BOYINB

Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565).

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfInstallationBuoy | enumeration | 0..1 | 1 : catenary anchor leg mooring (CALM) 2 : single buoy mooring (SBM) | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.7 Buoy, lateral (BOYLAT)

Name: **Buoy, lateral** Code (registry camel case): "BuoyLateral"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A lateral buoy is used to indicate the port or starboard hand side of the route to be followed. They are generally used for well defined channels and are used in conjunction with a conventional direction of buoyage.

**Definition reference**: *(no definition references)*

Alias: BOYLAT

Remarks: (None)

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfLateralMark | enumeration | 1..1 | 1 : port-hand lateral mark 2 : starboard-hand lateral mark 3 : preferred channel to starboard lateral mark 4 : preferred channel to port lateral mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 0..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.8 Buoy, cardinal (BOYCAR)

Name: **Buoy, cardinal** Code (registry camel case): "BuoyCardinal"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A cardinal buoy is used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West), bounded by inter-cardinal bearings from the point marked.

**Definition reference**: *(no definition references)*

Alias: BOYCAR

Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary S-32 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfCardinalMark | enumeration | 1..1 | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.9 Buoy, safe water (BOYSAW)

Name: **Buoy, safe water** Code (registry camel case): "BuoySafeWater"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A safe water buoy is used to indicate that there is navigable water around the mark.

**Definition reference**: *(no definition references)*

Alias: BOYSAW

Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 0..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.10 Buoy, isolated danger (BOYISD)

Name: **Buoy, isolated danger** Code (registry camel case): "BuoyIsolatedDanger"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A isolated danger buoy is a buoy moored on or above an isolated danger of limited extent, which has navigable water all around it.

**Definition reference**: *(no definition references)*

Alias: BOYISD

Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.11 Buoy, special purpose/general (BOYSPP)

Name: **Buoy, special purpose/general** Code (registry camel case): "BuoySpecialPurposeGeneral"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A special purpose buoy is primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Sailing Directions or Notices to Mariners (UKHO NP 735, 5th Edition). Buoy in general: A buoy whose appearance or purpose is not adequately known.

**Definition reference**: *(no definition references)*

Alias: BOYSPP

Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfSpecialPurposeMark | enumeration | 1..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.12 Offshore platform (OFSPLF)

Name: **Offshore platform** Code (registry camel case): "OffshorePlatform"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A permanent offshore structure, either fixed or floating, used in the production of oil or natural gas.

**Definition reference**: *(no definition references)*

Alias: OFSPLF

Remarks: (None)

Permitted primitives: point, surface featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfOffshorePlatform | enumeration | 0..1 | 1 : oil derrick/rig 2 : production platform 3 : observation/research platform 4 : articulated loading platform (ALP) 5 : single anchor leg mooring (SALM) 6 : mooring tower 7 : artificial island 8 : floating production, storage and offloading vessel (FPSO) 9 : accommodation platform 10 : navigation, communication and control buoy (NCCB) | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| product | enumeration | 0..\* | 1 : oil 2 : gas 3 : water 4 : stone 5 : coal 6 : ore 7 : chemicals 8 : drinking water 9 : milk 10 : bauxite 11 : coke 12 : iron ingots 13 : salt 14 : sand 15 : timber 16 : sawdust/wood chips 17 : scrap metal 18 : liquified natural gas (LNG) 19 : liquified petroleum gas (LPG) 20 : wine 21 : cement 22 : grain | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| verticalLength | real | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.13 Light vessel (LITVES)

Name: **Light vessel** Code (registry camel case): "LightVessel"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A distinctively marked vessel anchored or moored at a charted point, to serve as an aid to navigation. By night, it displays a characteristic light(s) and is usually equipped with other devices, such as fog signal, submarine sound signal, and radio-beacon, to assist navigation.

**Definition reference**: *(no definition references)*

Alias: LITVES

Remarks: Also called 'light ship'. The light(s), fog signal etc. of a light vessel is a separate object, handled as with buoys, beacons, etc.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| horizontalAccuracy | real | 0..1 |  | false |
| horizontalLength | real | 0..1 |  | false |
| horizontalWidth | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.14 Pile (PILPNT)

Name: **Pile** Code (registry camel case): "Pile"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A long heavy timber or section of steel, wood, concrete, etc. forced into the earth which may serve as a support, as for a pier, or a free standing pole within a marine environment.

**Definition reference**: *(no definition references)*

Alias: PILPNT

Remarks: (None)

Permitted primitives: point, curve, surface featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfPile | enumeration | 0..1 | 1 : stake 3 : post 4 : tripodal | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| height | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.15 Silo/tank (SILTNK)

Name: **Silo/tank** Code (registry camel case): "SiloTank"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: An enclosed container, used for storage.

**Definition reference**: *(no definition references)*

Alias: SILTNK

Remarks: (None)

Permitted primitives: point, surface featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| buildingShape | enumeration | 0..1 | 5 : high-rise building 6 : pyramid 7 : cylindrical 8 : spherical 9 : cubic | false |
| categoryOfSiloTank | enumeration | 0..1 | 1 : silo in general 2 : tank in general 3 : grain elevator 4 : water tower | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| product | enumeration | 0..\* | 1 : oil 2 : gas 3 : water 4 : stone 5 : coal 6 : ore 7 : chemicals 8 : drinking water 9 : milk 10 : bauxite 11 : coke 12 : iron ingots 13 : salt 14 : sand 15 : timber 16 : sawdust/wood chips 17 : scrap metal 18 : liquified natural gas (LNG) 19 : liquified petroleum gas (LPG) 20 : wine 21 : cement 22 : grain 23 : electricity 24 : ice 25 : clay | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.16 Landmark (LNDMRK)

Name: **Landmark** Code (registry camel case): "Landmark"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A prominent object at a fixed location which can be used in determining a location or a direction.

**Definition reference**: *(no definition references)*

Alias: LNDMRK

Remarks: (None)

Permitted primitives: point, curve, surface featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| elevation | real | 0..1 |  | false |
| function | enumeration | 0..\* | 2 : harbour-master's office 3 : customs office 4 : health office 5 : hospital 6 : post office 7 : hotel 8 : railway station 9 : police station 10 : water-police station 11 : pilot office 12 : pilot lookout 13 : bank office 14 : headquarters for district control 15 : transit shed/warehouse 16 : factory 17 : power station 18 : administrative 19 : educational facility 20 : church 21 : chapel 22 : temple 23 : pagoda 24 : shinto shrine 25 : buddhist temple 26 : mosque 27 : marabout 28 : lookout 29 : communication 30 : television 31 : radio 32 : radar 33 : light support 34 : microwave 35 : cooling 36 : observation 37 : time ball 38 : clock 39 : control 40 : airship mooring 41 : stadium 42 : bus station 43 : passenger terminal building 44 : sea rescue control 45 : observatory 46 : ore crusher 47 : boathouse 48 : pumping station | false |
| height | real | 0..\* |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.17 Light float (LITFLT)

Name: **Light float** Code (registry camel case): "LightFloat"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A boat-like structure used instead of a light buoy in waters where strong streams or currents are experienced, or when a greater elevation than that of a light buoy is necessary.

**Definition reference**: *(no definition references)*

Alias: LITFLT

Remarks: The light of a light float is a separate object, handled as with buoys, beacons, etc.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| radarConspicuous | boolean | 0..1 |  | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous prominent 2 : not visually conspicuous prominent | false |
| horizontalLength | real | 0..1 |  | false |
| horizontalWidth | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Categpru 3 | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.18 Topmark (TOPMAR)

Name: **Topmark** Code (registry camel case): "Topmark"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A characteristic shape secured at the top of a buoy or beacon to aid in its identification.

**Definition reference**: *(no definition references)*

Alias: TOPMAR

Remarks: The body carrying the topmark is a separate object.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| topmarkDaymarkShape | enumeration | 1..1 | 1 : cone, point up 2 : cone, point down 3 : sphere 4 : 2 spheres 5 : cylinder (can) 6 : board 7 : x-shape (St. Andrew's cross) 8 : upright cross (St. George's Cross) 9 : cube, point up 10 : 2 cones, point to point 11 : 2 cones, base to base 12 : rhombus 13 : 2 cones (points upward) 14 : 2 cones (points downward) 15 : besom, point up (broom or perch) 16 : besom, point down (broom or perch) 17 : flag 18 : sphere over rhombus 19 : square 20 : rectangle, horizontal 21 : rectangle, vertical 22 : trapezium, up 23 : trapezium, down 24 : triangle, point up 25 : triangle, point down 26 : circle 27 : two upright crosses (one over the other) 28 : T-shape 29 : triangle pointing up over a circle 30 : upright cross over a circle 31 : rhombus over a circle 32 : circle over a triangle pointing up 33 : other shape (see INFORM) | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.19 Light (LIGHTS)

Name: **Light** Code (registry camel case): "Light"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A luminous or lighted aid to navigation.

**Definition reference**: *(no definition references)*

Alias: LIGHTS

Remarks: A light may be fixed on a buoy, beacon, tower, etc. These are separate objects.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfLight | enumeration | 0..\* | 4 : leading light 5 : aero light 6 : air obstruction light 7 : fog detector light 8 : flood light 9 : strip light 10 : subsidiary light 11 : spotlight 12 : front 13 : rear 14 : lower 15 : upper 17 : emergency 18 : bearing light 19 : horizontally disposed 20 : vertically disposed | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| exhibitionConditionOfLight | enumeration | 0..1 | 1 : light shown without change of character 2 : daytime light 3 : fog light 4 : night light | false |
| height | real | 0..1 |  | false |
| lightCharacteristic | enumeration | 1..1 | 1 : fixed 2 : flashing 3 : long-flashing 4 : quick-flashing 5 : very quick flashing 6 : ultra quick flashing 7 : isophased 8 : occulting 9 : interrupted quick flashing 10 : interrupted very quick flashing 11 : interrupted ultra quick flashing 12 : morse 13 : fixed and flash 14 : flash and long-flash 15 : occulting and flash 16 : fixed and long-flash 17 : occulting alternating 18 : long-flash alternating 19 : flash alternating 25 : quick-flash plus long-flash 26 : very quick-flash plus long-flash 27 : ultra quick-flash plus long-flash 28 : alternating 29 : fixed and alternating flashing | false |
| lightVisibility | enumeration | 0..\* | 1 : high intensity 2 : low intensity 3 : faint 4 : intensified 5 : unintensified 6 : visibility deliberately restricted 7 : obscured 8 : partially obscured 9 : visible in line of range | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| multiplicityOfLights | integer | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| orientationValue | real | 0..1 |  | false |
| sectorLimitOne | real | 0..1 |  | false |
| sectorLimitTwo | real | 0..1 |  | false |
| signalGroup | text | 0..1 |  | false |
| signalPeriod | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| typeOfLight | text | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| valueOfGeographicalRange | text | 0..1 |  | false |
| valueOfLuminousRange | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.20 Fog signal (FOGSIG)

Name: **Fog signal** Code (registry camel case): "FogSignal"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A warning signal transmitted by a vessel, or aid to navigation, during periods of low visibility. Also, the device producing such a signal.

**Definition reference**: *(no definition references)*

Alias: FOGSIG

Remarks: (None)

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfFogSignal | enumeration | 1..1 | 1 : explosive 2 : diaphone 3 : siren 4 : nautophone 5 : reed 6 : tyfon 7 : bell 8 : whistle 9 : gong 10 : horn | false |
| signalFrequency | integer | 0..1 |  | false |
| signalGeneration | enumeration | 0..1 | 1 : automatically 2 : by wave action 3 : by hand 4 : by wind | false |
| signalGroup | text | 0..1 |  | false |
| signalPeriod | real | 0..1 |  | false |
| signalSequence | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| valueOfMaximumRange | real | 0..1 |  | false |
| signalOutput | text | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.21 Retro-reflector (RETRFL)

Name: **Retro-reflector** Code (registry camel case): "RetroReflector"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A means of distinguishing unlighted marks at night. Retro-reflective material is secured to the mark in a particular pattern to reflect back light.

**Definition reference**: *(no definition references)*

Alias: RETRFL

Remarks: The body carrying the retro-reflector is a separate object.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system 11 : CEVNI | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.22 Radar reflector (RADRFL)

Name: **Radar reflector** Code (registry camel case): "RadarReflector"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A device capable of, or intended for, reflecting radar signals.

**Definition reference**: *(no definition references)*

Alias: RADRFL

Remarks: A radar reflector is usually a tetrahedron or pentagonal corner reflector to facilitate reflection towards the sender.(International Maritime Dictionary, 2nd Ed.). The object 'radar reflector' is only used to encode a device specifically intended to reflect radar signals. If any other object, e.g. topmark, buoy, beacon, etc. is radar conspicuous, because of its construction, the attribute 'CONRAD' must be used.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| height | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.23 Environment Observation Equipment (*no alias*)

Name: **Environment Observation Equipment** Code (registry camel case): "EnvironmentObservationEquipment"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: *Definition required*

**Definition reference**: *(no definition references)*

Alias: (no aliases)

Remarks: (None)

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| height | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| typeOfEnvironmentObservationEquipment | text | 1..\* |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.24 Daymark (DAYMAR)

Name: **Daymark** Code (registry camel case): "Daymark"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: The identifying characteristics of an aid to navigation which serve to facilitate its recognition against a daylight viewing background.

**Definition reference**: *(no definition references)*

Alias: DAYMAR

Remarks: On those structures that do not by themselves present an adequate viewing area to be seen at the required distance, the aid is made more visible by affixing a daymark to the structure. A daymark so affixed has a distinctive colour and shape depending on the purpose of the aid.

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfSpecialPurposeMark | enumeration | 0..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark 57 : ice mark 58 : nature reserve mark 59 : fish aggregating device (FAD) 60 : wreck mark 61 : customs mark 62 : causeway mark 63 : wave recorder | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : white horizontal stripes 2 : black vertical stripes 3 : red diagonal stripes 4 : green squared 5 : blue stripes (direction unknown) 6 : yellow border stripe | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 11 : latticed 12 : glass | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 28 : buoyed | false |
| topmarkDaymarkShape | enumeration | 1..1 | 1 : cone, point up 2 : cone, point down 3 : sphere 4 : 2 spheres 5 : cylinder (can) 6 : board 7 : x-shape (St. Andrew's cross) 8 : upright cross (St. George's Cross) 9 : cube, point up 10 : 2 cones, point to point 11 : 2 cones, base to base 12 : rhombus 13 : 2 cones (points upward) 14 : 2 cones (points downward) 15 : besom, point up (broom or perch) 16 : besom, point down (broom or perch) 17 : flag 18 : sphere over rhombus 19 : square 20 : rectangle, horizontal 21 : rectangle, vertical 22 : trapezium, up 23 : trapezium, down 24 : triangle, point up 25 : triangle, point down 26 : circle 27 : two upright crosses (one over the other) 28 : T-shape 29 : triangle pointing up over a circle 30 : upright cross over a circle 31 : rhombus over a circle 32 : circle over a triangle pointing up 33 : other shape (see INFORM) | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| verticalLength | real | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.25 Radar transponder beacon (RTPBCN)

Name: **Radar transponder beacon** Code (registry camel case): "RadarTransponderBeacon"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A transponder beacon transmitting a coded signal on radar frequency, permitting an interrogating craft to determine the bearing and range of the transponder.

**Definition reference**: *(no definition references)*

Alias: RTPBCN

Remarks: The object class 'radar transponder beacon' is only used to encode the technical equipment independent of the structure on which it is located (e.g. a beacon, light-vessel or tower).

Permitted primitives: point featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfRadarTransponderBeacon | enumeration | 1..1 | 1 : ramark, radar beacon transmitting continuously 2 : racon, radar transponder beacon 3 : leading racon/radar transponder beacon | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| radarWaveLength | text | 0..1 |  | false |
| sectorLimitOne | real | 0..1 |  | false |
| sectorLimitTwo | real | 0..1 |  | false |
| signalGroup | text | 0..1 |  | false |
| signalSequence | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| valueOfNominalRange | real | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotlyMonitored | text | 0..1 |  | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.26 Recommended track (RECTRC)

Name: **Recommended track** Code (registry camel case): "RecommendedTrack"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A track recommended to all or only certain vessels.

**Definition reference**: *(no definition references)*

Alias: RECTRC

Remarks: Recommended tracks include all channels recommended for hydrographic reasons to lead safely between shoal depths. The use of such tracks is generally left to the discretion of the mariner and will depend on the vessel's draught, the state of the tide, adequacy of navigational aids and so on (IHO Chart Specifications, M-4). The recommended track is that portion of a 'navigation line' that a ship should use for navigation. In the case of a two-way recommended track only one value of orientation is encoded (in the attribute ORIENT); the other value can be deduced (i.e. the value in ORIENT + 180 degrees).

Permitted primitives: curve, surface featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfRecommendedTrack | enumeration | 1..1 | 1 : based on a system of fixed marks 2 : not based on a system of fixed marks | false |
| depthRangeMaximumValue | real | 0..1 |  | false |
| depthRangeMinimumValue | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| qualityOfSoundingMeasurement | enumeration | 0..\* | 1 : depth known 2 : depth or least depth unknown 3 : doubtful sounding 4 : unreliable sounding 5 : no bottom found at value shown 6 : least depth known 7 : least depth unknown, safe clearance at depth shown 8 : value reported (not surveyed) 9 : value reported (not confirmed) 10 : maintained depth 11 : not regularly maintained | false |
| soundingUncertainty | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| techniqueOfSoundingMeasurement | enumeration | 0..\* | 1 : found by echo-sounder 2 : found by side-scan-sonar 3 : found by multi-beam 4 : found by diver 5 : found by lead-line 6 : swept by wire-drag 7 : found by laser 8 : swept by vertical acoustic system 9 : found by electromagnetic sensor 10 : photogrammetry 11 : satellite imagery 12 : found by levelling 13 : swept by side-scan-sonar 14 : computer generated | false |
| trafficFlow | enumeration | 0..1 | 1 : inbound 2 : outbound 3 : one-way 4 : two-way | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.27 Navigation line (NAVLNE)

Name: **Navigation line** Code (registry camel case): "NavigationLine"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: A navigation line is a straight line extending towards an area of navigational interest and generally generated by two navigational aids or one navigational aid and a bearing.

**Definition reference**: *(no definition references)*

Alias: NAVLNE

Remarks: The extent of the navigation line depends on the visibility of the navigational aid(s). The attribute 'orientation' (ORIENT) specifies the orientation of the navigation line measured from the water towards the navigational aid(s). The recommended track is that portion of a 'navigation line' that a ship should use for navigation.

Permitted primitives: curve featureUseType=Geographic

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfNavigationLine | enumeration | 1..1 | 1 : clearing line 2 : transit line 3 : leading line bearing a recommended track | false |
| orientationValue | real | 1..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful | false |
| idcode | text | 1..1 |  | false |
| dateEnd | text | 0..1 |  | false |
| dateStart | text | 0..1 |  | false |
| periodicDateEnd | text | 0..1 |  | false |
| periodicDateStart | text | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | text | 0..1 |  | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.28 Aggregation (C\_AGGR)

Name: **Aggregation** Code (registry camel case): "Aggregation"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: Used to identify an aggregation of two or more objects. This aggregation may be named.

**Definition reference**: *(no definition references)*

Alias: C\_AGGR

Remarks: An aggregation could be used to combine objects that are related in some way (is-a-part-of, is-a-component-of) into a higher level object. For example: an aggregation relationship may be used to form a traffic separation scheme from traffic separation lane parts, boundaries, etc.

Permitted primitives: noGeometry featureUseType=Aggregation

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfAggregation | enumeration | 1..1 | 1 : leading line 2 : range system | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

## 9.29 Association (C\_ASSO)

Name: **Association** Code (registry camel case): "Association"

|  |  |  |
| --- | --- | --- |
| isAbstract=*(none)* | superType=*(none)* | subType=*(none)* |

IHO Definition: Used to identify an association between two or more objects. The association may be named.

**Definition reference**: *(no definition references)*

Alias: C\_ASSO

Remarks: For example, an association relationship may be used to indicate that a buoy marks a wreck.

Permitted primitives: noGeometry featureUseType=Aggregation

### Attribute Bindings

| attribute | type | multiplicity | permittedValues | sequential |
| --- | --- | --- | --- | --- |
| categoryOfAssociation | enumeration | 1..1 | 1 : channel markings 2 : danger markings | false |

### Feature Bindings

No feature bindings

### Information Bindings

No information bindings

# 10 Missing Type Definitions

Feature codes used but not defined:

Information type codes used but not defined:

In feature types:

In information types:

Attribute codes used but not defined:

In features:

In information types:

In complex attributes: