

**IALA S-201**

**Product Specification**

**Draft 0.0.7 – July 2017**

IALA AtoN Product Specification

**ANNEX F**

Table of Contents

Application Schema Types 3

Feature Types 3

«FeatureType» Aggregation 3

«FeatureType» Association 3

«FeatureType» BeaconCardinal 3

«FeatureType» BeaconIsolatedDanger 6

«FeatureType» BeaconLateral 9

«FeatureType» BeaconSafeWater 12

«FeatureType» BeaconSpecialPurposeGeneral 15

«FeatureType» BuoyCardinal 18

«FeatureType» BuoyInstallation 21

«FeatureType» BuoyIsolatedDanger 23

«FeatureType» BuoyLateral 26

«FeatureType» BuoySafeWater 28

«FeatureType» BuoySpecialPurposeGeneral 31

«FeatureType» Daymark 33

«FeatureType» FogSignal 36

«FeatureType» IALA\_EnvironmentObservationEquipment 37

«FeatureType» IALA\_Lighthouse 38

«FeatureType» Landmark 40

«FeatureType» Light 41

«FeatureType» LightFloat 46

«FeatureType» LightVessel 47

«FeatureType» NavigationLine 49

«FeatureType» OffshorePlatform 50

«FeatureType» Pile 52

«FeatureType» RadarReflector 53

«FeatureType» RadarTransponderBeacon 54

«FeatureType» RecommendedTrack 56

«FeatureType» RetroReflector 57

«FeatureType» SiloTank 58

«FeatureType» Topmark 60

Abstract Feature Types 62

«FeatureType» AidsToNavigation 62

«FeatureType» Equipment 63

«FeatureType» GenericBeacon 64

«FeatureType» GenericBuoy 67

«FeatureType» StructureObject 70

Meta Feature Types 71

«FeatureType» DataCoverage 71

«FeatureType» LocalDirectionOfBuoyage 71

«FeatureType» NavigationalSystemOfMarks 72

«FeatureType» QualityOfNonBathymetricData 72

«FeatureType» SoundingDatum 72

«FeatureType» VerticalDatum 72

Information Types 73

«InformationType» SpatialUncertainty 73

Complex Attributes 73

«ComplexAttributeType» contactAddress 73

«ComplexAttributeType» surveyDateRange 73

CodeLists 73

«S100\_CodeList» IALA\_categoryOfAggregation 73

«S100\_CodeList» IALA\_categoryOfAssociation 73

Enumerated Types 74

«Enumeration» IALA\_aidAvailabilityCategory 74

«Enumeration» beaconShape 74

«Enumeration» buildingShape 74

«Enumeration» buoyShape 75

«Enumeration» categoryOfCardinalMark 75

«Enumeration» categoryOfFogSignal 75

«Enumeration» categoryOfInstallationBuoy 76

«Enumeration» categoryOfLandmark 76

«Enumeration» categoryOfLateralMark 77

«Enumeration» categoryOfLight 77

«Enumeration» categoryOfNavigationLine 78

«Enumeration» categoryOfOffshorePlatform 78

«Enumeration» categoryOfPile 78

«Enumeration» categoryOfRadarTransponderBeacon 78

«Enumeration» categoryOfRecommendedTrack 79

«Enumeration» categoryOfSiloTank 79

«Enumeration» categoryOfSpecialPurposeMark 79

«Enumeration» categoryOfTemporalVariation 81

«Enumeration» colour 81

«Enumeration» colourPattern 81

«Enumeration» condition 82

«Enumeration» exhibitionConditionOfLight 82

«Enumeration» function 82

«Enumeration» lightCharacteristic 83

«Enumeration» lightVisibility 83

«Enumeration» marksNavigationalSystemOf 84

«Enumeration» natureOfConstruction 84

«Enumeration» product 84

«Enumeration» qualityOfPosition 85

«Enumeration» qualityOfSoundingMeasurement 85

«Enumeration» radarConspicuous 85

«Enumeration» signalGeneration 85

«Enumeration» status 86

«Enumeration» techniqueOfSoundingMeasurement 86

«Enumeration» topmarkDaymarkShape 86

«Enumeration» trafficFlow 87

«Enumeration» verticalDatum 87

«Enumeration» visuallyConspicuous 88

# Application Schema Types

## Feature Types

### «FeatureType» Aggregation

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

content of categoryOfAggregation should be put in information attribute when converting to S-57.

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_categoryOfAggregation | [1] | IALA\_categoryOfAggregation |  |

**Inherited Attributes**

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| Aggregations | *Label:* Aggregation  *Role:* peer  *Multiplicity:* 0..\* | *Label:* AidsToNavigation  *Role:* peer  *Multiplicity:* 0..\* | Aggregation of two or more objects |

### «FeatureType» Association

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

content of categoryOfAssociation should be put in information attribute when converting to S-57.

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_categoryOfAssociation | [1] | IALA\_categoryOfAssociation |  |

**Inherited Attributes**

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| Associations | *Label:* Association  *Role:* peer  *Multiplicity:* 0..\* | *Label:* AidsToNavigation  *Role:* peer  *Multiplicity:* 0..\* | Association between two or more objects |

### «FeatureType» BeaconCardinal

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).

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. (UKHO NP 735, 5th Edition)

Super-type: GenericBeacon

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfCardinalMark | [1] | categoryOfCardinalMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BeaconIsolatedDanger

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).

An isolated danger beacon is a beacon erected on an isolated danger of limited extent, which has navigable water all around it. (UKHO NP735, 5th Edition)

Super-type: GenericBeacon

**Attributes**

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BeaconLateral

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).

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. (UKHO NP 735, 5th Edition)

Super-type: GenericBeacon

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLateralMark | [1] | categoryOfLateralMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BeaconSafeWater

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 (IHO Dictionary, S-32, 5th Edition, 420).

A safe water beacon may be used to indicate that there is navigable water around the mark. (UKHO NP735, 5th Edition)

Super-type: GenericBeacon

**Attributes**

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BeaconSpecialPurposeGeneral

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).

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.

Super-type: GenericBeacon

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfSpecialPurposeMark | [1..\*] | categoryOfSpecialPurposeMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoyCardinal

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.

Super-type: GenericBuoy

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfCardinalMark | [1] | categoryOfCardinalMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoyInstallation

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).

An installation buoy is a buoy used for loading tankers with gas or oil. (IHO Chart Specifications, M-4)

Super-type: GenericBuoy

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfInstallationBuoy | [1] | categoryOfInstallationBuoy |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoyIsolatedDanger

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).

A isolated danger buoy is a buoy moored on or above an isolated danger of limited extent, which has navigable water all around it. (UKHO NP735, 5th Edition)

Super-type: GenericBuoy

**Attributes**

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoyLateral

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).

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. (UKHO NP 735, 5th Edition)

Super-type: GenericBuoy

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLateralMark | [1] | categoryOfLateralMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoySafeWater

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).

A safe water buoy is used to indicate that there is navigable water around the mark. (UKHO NP735, 5th Edition)

Super-type: GenericBuoy

**Attributes**

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» BuoySpecialPurposeGeneral

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).

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.

Super-type: GenericBuoy

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfSpecialPurposeMark | [1..\*] | categoryOfSpecialPurposeMark |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» Daymark

The identifying characteristics of an aid to navigation which serve to facilitate its recognition against a daylight viewing background. 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. (IHO Dictionary, S-32, 5th Edition, 1248)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfSpecialPurposeMark | [0..1] | categoryOfSpecialPurposeMark |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the dataset metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | status | [0..\*] | status |  |
| Attribute | topmarkDaymarkShape | [1] | topmarkDaymarkShape |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» FogSignal

A warning signal transmitted by a vessel, or aid to navigation, during periods of low visibility. Also, the device producing such a signal. (IHO Dictionary, S-32, 5th Edition, 1890)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfFogSignal | [1] | categoryOfFogSignal |  |
| Attribute | signalFrequency | [0..1] | int |  |
| Attribute | signalGeneration | [0..1] | signalGeneration |  |
| Attribute | signalGroup | [0..1] | text |  |
| Attribute | signalPeriod | [0..1] | real |  |
| Attribute | signalSequence | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | valueOfMaximumRange | [0..1] | real |  |
| Attribute | IALA\_signalOutput | [0..1] | real | Given in dB |
| Attribute | IALA\_typeOfBattery | [0..1] | text | Given in dB |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» IALA\_EnvironmentObservationEquipment

A sensor used to observe the environment.

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | status | [0..\*] | status |  |
| Attribute | height | [0..1] | real |  |
| Attribute | IALA\_typeOfEnvironmentObservationEquipment | [1..\*] | text | Type of sensor used to observe the environment. e.g. Anemometer, fog monitor, etc |
| Attribute | IALA\_typeOfBattery | [0..1] | text |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» IALA\_Lighthouse

A distinctive structure on or off a coast exhibiting a major light designed to serve as an aid to navigation. (IHO S-32 - 2822, 5th Edition, 1994).

Super-type: Landmark

Constraints

can only have point or area geometry

**Attributes**

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLandmark | [1..\*] | categoryOfLandmark |  |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | elevation | [0..1] | real |  |
| Attribute | function | [0..\*] | function |  |
| Attribute | height | [0..1] | real |  |
| Attribute | IALA\_mannedStructure | [0..1] | boolean |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real |  |
| Attribute | visuallyConspicuous | [1] | visuallyConspicuous |  |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» Landmark

A relatively permanent structure, roofed and usually walled. It is designed for some particular use which it may be important to indicate. (Digital Geographic Information Working Group, Oct.87)

Super-type: StructureObject

Constraints

Can only have point, line or area geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLandmark | [1..\*] | categoryOfLandmark |  |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [1] | visuallyConspicuous |  |
| Attribute | elevation | [0..1] | real |  |
| Attribute | function | [0..\*] | function |  |
| Attribute | height | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real |  |
| Attribute | IALA\_mannedStructure | [0..1] | boolean |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» Light

A luminous or lighted aid to navigation. (adapted from IHO Dictionary, S-32, 5th Edition, 2766)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLight | [0..\*] | categoryOfLight |  |
| Attribute | colour | [1] | colour |  |
| Attribute | exhibitionConditionOfLight | [0..1] | exhibitionConditionOfLight |  |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres.  Remarks:  Height must not be used for floating objects. |
| Attribute | lightCharacteristic | [1] | lightCharacteristic |  |
| Attribute | lightVisibility | [0..\*] | lightVisibility |  |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | multiplicityOfLights | [0..1] | int | Definition:  The number of lights of identical character that exist as a co-located group.  Minimum Value: 2  Indication:  Unit: none  Resolution: 1  Format:  xx  Example:  5 |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | orientation | [0..1] | real |  |
| Attribute | sectorLimitOne | [0..1] | int |  |
| Attribute | sectorLimitTwo | [0..1] | int |  |
| Attribute | signalGroup | [0..1] | text | Definition:  The number of signals, the combination of signals or the morse character(s) within one period of full  sequence.  References:  INT 1: IP 10.2-9; IR 20, 22;  M-4: 453; 453.1-4; 471.2;  Indication:  The signal group of a light is encoded using brackets to separate the individual groups. A group of  signals may be a single number, a chain of numbers separated by "+", a sequence of up to 4 letters  or a letter and a number.  A fixed light has no signal group.  Where no specific signal group is given for one of the light characteristics, this should be shown by  an empty pair of brackets.  Format:  (c)(c)...  Examples:  Light characteristic SIGGRP Indication  VQ(6)+LFl -> (6)(1)  Fl+LFl (2+3) -> (1)(2+3)  Fl(2)+Lfl(3) -> (2)(3)  FFl -> ()(1)  Mo(AA) -> (AA)  AlFl(2W+1R) -> (2+1)  AlLFlWR -> (2)  FOcW -> ()(1)  AlOc(4)WR -> (4) |
| Attribute | signalPeriod | [0..1] | real | Definition:  The time occupied by an entire cycle of intervals of light and eclipse.  References:  INT 1: IP 12; IR 20, 22;  M-4: 453.5; 471.5;  Minimum Value: 0  Indication:  Unit: second (s)  Resolution: 0.01 s  Format:  xx.xx  Example:  12 for an interval of 12 seconds.  Remarks:  No remarks. |
| Attribute | signalSequence | [0..1] | text | 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.  Indication:  Unit for value of intervals: second (s)  resolution: 0.01 s  Format:  LL.L + (EE.E)  Example:  00.8+(02.2)+00.8+(05.2)  The above example encodes a signal sequence with two intervals of light and two intervals of eclipse.  For occulting lights, the >signal sequence=is indicated using a fixed format to encode the values of  intervals of eclipse (E) and (L).  Format:  (EE.E)+LL.L  Example:  (00.8)+02.2+(00.8)+05.2)  The above example encodes a signal sequence with two intervals of eclipse and two intervals of light.  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). |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | valueOfNominalRange | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres.  Remarks:  Height must not be used for floating objects. |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | IALA\_typeOfLight | [0..1] | text | Types of Light : e.g. Bulb type(250mm, 300mm, 400mm), LED type(Integral type, 200, 200HI, 250, 300, 350) |
| Attribute | IALA\_typeOfBattery | [0..1] | text | Types of storage battery for light e.g. Hi-Ca 100, PS-250E, LDA-400, VGS-350 |
| Attribute | IALA\_valueOfGeographicalRange | [0..1] | real |  |
| Attribute | IALA\_valueOfLuminousRange | [0..1] | real |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» LightFloat

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 (IHO Dictionary, S-32, 5th Edition, 2821).

Super-type: StructureObject

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | horizontalAccuracy | [0..1] | real |  |
| Attribute | horizontalLength | [0..1] | real |  |
| Attribute | horizontalWidth | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalLength | [0..1] | real |  |
| Attribute | IALA\_mannedStructure | [0..1] | boolean | An expression of the feature being permanently manned or not |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» LightVessel

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. Also called light ship. (IHO Dictionary, S-32, 5th Edition, 2828,2829)

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. Also called light ship. (IHO Dictionary, S-32, 5th Edition, 2828,2829)

Super-type: StructureObject

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | horizontalAccuracy | [0..1] | real |  |
| Attribute | horizontalLength | [0..1] | real |  |
| Attribute | horizontalWidth | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalLength | [0..1] | real |  |
| Attribute | IALA\_mannedStructure | [0..1] | boolean |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» NavigationLine

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. (Service Hydrographique

et Océanographique de la Marine, France)

Super-type: AidsToNavigation

Constraints

Can only have line geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfNavigationLine | [1] | categoryOfNavigationLine |  |
| Attribute | orientation | [1] | real |  |
| Attribute | status | [0..\*] | status |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| RangeSystem | *Label:* RecommendedTrack  *Role:* navigableTrack  *Multiplicity:* 0..\* | *Label:* NavigationLine  *Role:* navigationLine  *Multiplicity:* 1..\* | An association between a navigational line and the part of that line that is safe to navigate along. |

### «FeatureType» OffshorePlatform

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

(IHO Dictionary, S-32, 5th Edition, 3895)

Super-type: StructureObject

Constraints

Can only have point or area geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfOffshorePlatform | [0..\*] | categoryOfOffshorePlatform |  |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | height | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | product | [0..\*] | product |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real |  |
| Attribute | IALA\_mannedStructure | [0..1] | boolean |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» Pile

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. (Adapted from IHO Dictionary, S-32, 5th Edition, 3840)

Super-type: StructureObject

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfPile | [0..1] | categoryOfPile |  |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | height | [0..1] | real |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» RadarReflector

A device capable of, or intended for, reflecting radar signals. (IHO Dictionary, S-32, 5th Edition, 4147)

A radar reflector is usually a >tetrahedron or pentagonal corner reflector (...) to facilitate reflection towards the sender. (International Maritime Dictionary, 2nd Ed.)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | height | [0..1] | real |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» RadarTransponderBeacon

A transponder beacon transmitting a coded signal on radar frequency, permitting an interrogating craft to determine the bearing and range of the transponder. Also called racon. (IHO Dictionary, S-32, 5th Edition, 4137)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfRadarTransponderBeacon | [1] | categoryOfRadarTransponderBeacon |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | radarWaveLength | [0..1] | text |  |
| Attribute | sectorLimitOne | [0..1] | int |  |
| Attribute | sectorLimitTwo | [0..1] | int |  |
| Attribute | signalGroup | [0..1] | text |  |
| Attribute | signalSequence | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | valueOfNominalRange | [0..1] | real |  |
| Attribute | IALA\_typeOfBattery | [0..1] | text |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» RecommendedTrack

A track recommended to all or only certain vessels. (IHO Dictionary, S-32, 5th Edition, 5576)

Super-type: AidsToNavigation

Constraints

Can only have line geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfRecommendedTrack | [0..1] | categoryOfRecommendedTrack |  |
| Attribute | depthRangeMinimumValue | [0..1] | real |  |
| Attribute | depthRangeMaximumValue | [0..1] | real |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | orientation | [1] | real |  |
| Attribute | qualityOfSoundingMeasurement | [0..\*] | qualityOfSoundingMeasurement |  |
| Attribute | soundingAccuracy | [0..1] | real |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | techniqueOfSoundingMeasurement | [0..\*] | techniqueOfSoundingMeasurement |  |
| Attribute | trafficFlow | [0..1] | trafficFlow |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| RangeSystem | *Label:* RecommendedTrack  *Role:* navigableTrack  *Multiplicity:* 0..\* | *Label:* NavigationLine  *Role:* navigationLine  *Multiplicity:* 1..\* | An association between a navigational line and the part of that line that is safe to navigate along. |

### «FeatureType» RetroReflector

A means of distinguishing unlighted marks at night. Retro-reflective material is secured to the mark in a particular pattern to reflect back light. (Adapted from the UKHO NP735, 5th Edition).

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | height | [0..1] | real |  |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» SiloTank

An enclosed container, used for storage (Digital Geographic Information Working Group, Oct.87)

Super-type: StructureObject

Constraints

Can only have point or area geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buildingShape | [0..1] | buildingShape |  |
| Attribute | categoryOfSiloTank | [0..1] | categoryOfSiloTank |  |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | elevation | [0..1] | real |  |
| Attribute | height | [0..1] | real |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | product | [0..1] | product |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real |  |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» Topmark

A characteristic shape secured at the top of a buoy or beacon to aid in its identification. (IHO Dictionary, S-32, 5th Edition, 5548)

Super-type: Equipment

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | colour | [0..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres.  Remarks:  Height must not be used for floating objects. |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | topmarkDaymarkShape | [1] | topmarkDaymarkShape |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalDatum | [0..1] | verticalDatum |  |
| Attribute | verticalLength | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres.  Remarks:  Height must not be used for floating objects. |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

## Abstract Feature Types

### «FeatureType» AidsToNavigation

A visual, acoustical, or radio device, external to a ship, designed to assist in determining a safe course or a vessel's position, or to warn of dangers and/or obstructions. Aids to navigation usually include buoys, beacons, fog signals, lights, radio beacons, leading marks, radio position fixing systems and GNSS which are chart-related and assist safe navigation.

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | idCode | [1] | text |  |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |

**Inherited Attributes**

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| Associations | *Label:* Association  *Role:* peer  *Multiplicity:* 0..\* | *Label:* AidsToNavigation  *Role:* peer  *Multiplicity:* 0..\* | Association between two or more objects |
| Aggregations | *Label:* Aggregation  *Role:* peer  *Multiplicity:* 0..\* | *Label:* AidsToNavigation  *Role:* peer  *Multiplicity:* 0..\* | Aggregation of two or more objects |

### «FeatureType» Equipment

the implements used in an operation or activity

Super-type: AidsToNavigation

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_remoteMonitoringSystem | [0..\*] | text |  |
| Attribute | IALA\_remotelyMonitored | [0..1] | boolean |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| StructureEquipment | *Label:* StructureObject  *Role:* parent  *Multiplicity:* | *Label:* Equipment  *Role:* child  *Multiplicity:* 0..\* | An aggregation between a structure object and the equipment that is mounted on it. |

### «FeatureType» GenericBeacon

A fixed artificial navigation mark that can be recognised by its shape, colour, pattern, topmark or light character, or a combination of these. It may carry various additional aids to navigation.

Super-type: StructureObject

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | beaconShape | [1] | beaconShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | condition | [0..1] | condition |  |
| Attribute | radarConspicuous | [0..1] | radarConspicuous |  |
| Attribute | visuallyConspicuous | [0..1] | visuallyConspicuous |  |
| Attribute | elevation | [0..1] | real | Definition:  The altitude of the ground level of an object, measured from a specified vertical datum.  Minimum Value: 0  References:  INT 1: IC 10-13; IH 20;  M-4: 352.1-2; 302.2; 405;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  47 for an elevation of 47 metres |
| Attribute | height | [0..1] | real | Definition:  The value of the vertical distance to the highest point of the object, measured from a specified vertical  datum.  Minimum Value: 0  References:  INT 1: IC 14; IE 4; IK 10-11;  M-4: 302; 352.4; 421.1-2;  Indication:  Unit: defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  73 for a height of 73 metres |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfConstruction | [0..\*] | natureOfConstruction |  |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | objectNameInNationalLanguage | [0..1] | text | Indication:  Name of object (c...):string of national language characters  Format:  c...  Remarks:  The attribute object name in national language encodes the individual name of an object in the specified national language. |
| Attribute | objectName | [0..1] | text | Definition:  The individual name of an object. |
| Attribute | status | [0..\*] | status |  |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» GenericBuoy

A floating object moored to the bottom in a particular (charted) place, as an aid to navigation or for other specific purposes.

Super-type: StructureObject

Constraints

Can only have point geometry

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | buoyShape | [1] | buoyShape |  |
| Attribute | colour | [1..\*] | colour |  |
| Attribute | colourPattern | [0..\*] | colourPattern |  |
| Attribute | radarConspicious | [0..1] | radarConspicuous |  |
| Attribute | marksNavigationalSystemOf | [0..1] | marksNavigationalSystemOf |  |
| Attribute | natureOfconstuction | [0..\*] | natureOfConstruction |  |
| Attribute | objectNameInNationalLanguage | [0..1] | text |  |
| Attribute | objectName | [0..1] | text |  |
| Attribute | status | [0..\*] | status |  |
| Attribute | verticalAccuracy | [0..1] | real | Expected input:  The one-dimensional error.  The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  Definition:  The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances,  excluding sounding measurements.  Minimum value: 0  Indication:  Unit: 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)  Resolution: 0.1 m or 0.1 ft  Format:  xx.x  Example:  1.2 for an error of 1.2 metres. |
| Attribute | verticalLength | [0..1] | real | Definition:  The total vertical length of an object.  References:  INT 1: IE 5; IL 21.3;  M-4: 303;  Minimum Value: 0  Indication:  Unit:defined in the data set metadata, e.g. metre (m)  Resolution: 0.1 m or 0.1 ft  Format:  xxx.x  Example:  24.5 for a vertical length of 24.5 metres.  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. |
| Attribute | IALA\_typeOfBuoy | [0..1] | text | Types of light buoy e.g. LANBY-100, LS-35, LL-30, LL-28, LL-26, LL-26(M), LL-24, LS-24, LSP-24, LT-10  Types of buoy e.g. U-17C(P), U-17S(P), U-17C(S), U-17S(S), UR-17C(P), UR-17S(P), UR-17C(S), UR-17S(S) |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |

**Associations**

### «FeatureType» StructureObject

something (such as a house, tower, bridge, etc.) that is built by putting parts together and that usually stands on its own

Super-type: AidsToNavigation

Spatial primitives: GM\_Point

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | IALA\_aidAvailabilityCategory | [1] | IALA\_aidAvailabilityCategory | A Category denoting the significance of an Aid to Navigation, expressed in terms of the probability that an AtoN or system of AtoN, as defined by the Competent Authority, is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an AtoN or system of AtoN should be performing their specified function.  adapted from the IALA Guideline No. 1035 To Availability and Reliability of Aids to Navigation - Theory and Examples. |

**Inherited Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | IALA\_AtoNMaintenanceRecord | [0..1] | URI | A reference following the Uniform Resource Identifier (URI) principles to a record of maintenance. |
| Attribute | IALA\_inspectionFrequency | [0..1] | text | A statement of how frequently an item is inspected |
| Attribute | IALA\_inspectionRequirements | [0..1] | text | A statement of what requirements are in place for how inspection of an item is carried out |
| Attribute | IALA\_installationDate | [0..1] | S100\_TruncatedDate | The date when an item was installed |
| Attribute | idCode | [1] | text |  |
| Attribute | information | [0..\*] | text | max 300 characters |
| Attribute | informationInNationalLanguage | [0..\*] | text | max 300 characters |
| Attribute | periodEnd | [0..1] | S100\_TruncatedDate |  |
| Attribute | periodStart | [0..1] | S100\_TruncatedDate |  |
| Attribute | pictorialRepresentation | [0..1] | text | file reference to text file |
| Attribute | ScaleMinimum | [0..1] | int |  |
| Attribute | sourceDate | [0..1] | dateTime |  |
| Attribute | sourceIndication | [0..1] | text | Definition:  Information about the source of the object.  Indication:  country (c2): Two letter code according to ISO 3166 (refer to Annex A to S-57 Appendix A)  authority (c2): A string of two alphanumeric characters (refer to Annex A to S-57 Appendix A),  e.g. German Bundesamt für Seeschiffahrt und Hydrographie = DE; US National  Imagery and Mapping Agency = U1.  procedure (c4): digitized = digi  scanned = scan  alpha/numeric input = alph  Format:  c2,c2,c4 (mandatory)  Example:  DK,D1,digi |
| Attribute | textualDescription | [0..1] | text | file reference to text file |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text | file reference to text file |
| Attribute | contactAddress | [0..1] | Complex |  |

**Associations**

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| StructureEquipment | *Label:* StructureObject  *Role:* parent  *Multiplicity:* | *Label:* Equipment  *Role:* child  *Multiplicity:* 0..\* | An aggregation between a structure object and the equipment that is mounted on it. |

## Meta Feature Types

### «FeatureType» DataCoverage

A geographical area that describes the coverage and extent of spatial types.

(Adapted from S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.210, November 2000).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | maximumDisplayScale | [1] | integer |  |
| Attribute | minimumDisplayScale | [1] | integer |  |

**Inherited Attributes**

**Associations**

### «FeatureType» LocalDirectionOfBuoyage

An area within which the navigational system of marks has been established in relation to a specific direction. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.214, November 2000).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | orientation | [1] | real |  |

**Inherited Attributes**

**Associations**

### «FeatureType» NavigationalSystemOfMarks

An area within which a specific system of navigational marks applies and/or a common direction of buoyage

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | marksNavigationalSystemOf | [1] | marksNavigationalSystemOf |  |

**Inherited Attributes**

**Associations**

### «FeatureType» QualityOfNonBathymetricData

An area within which a uniform assessment of the quality of the non-bathymetric data exists. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.208, November 2000).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfTemporalVariation | [1] | categoryOfTemporalVariation |  |
| Attribute | directionUncertainty | [0..1] | real |  |
| Attribute | horizontalDistanceUncertainty | [0..1] | real |  |
| Attribute | horizontalPositionUncertainty | [1] | real |  |
| Attribute | information | [0..1] | text |  |
| Attribute | informationInNationalLanguage | [0..1] | text |  |
| Attribute | textualDescription | [0..1] | text |  |
| Attribute | textualDescriptionInNationalLanguage | [0..1] | text |  |
| Attribute | verticalUncertainty | [0..1] | real |  |
| Attribute | surveyDateRange | [0..1] | Complex |  |

**Inherited Attributes**

**Associations**

### «FeatureType» SoundingDatum

The horizontal plane or tidal datum to which soundings have been

reduced. Also called datum for sounding reduction. (Adapted from IHO Dictionary – S-32).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | verticalDatum | [1] | verticalDatum |  |

**Inherited Attributes**

**Associations**

### «FeatureType» VerticalDatum

Any level surface from which to reference elevations. Also called datum

level, reference level, reference plane, levelling datum, datum for heights. (Adapted from IHO Dictionary – S-32).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | verticalDatum | [1] | verticalDatum |  |

**Inherited Attributes**

**Associations**

## Information Types

### «InformationType» SpatialUncertainty

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | qualityOfPosition | [0..1] | qualityOfPosition |  |
| Attribute | positionalAccuracy | [0..1] | real |  |

**Inherited Attributes**

**Associations**

## Complex Attributes

### «ComplexAttributeType» contactAddress

Direction or superscription of a letter, package, etc., specifying the name of the place to which it is directed, and optionally a contact person or organisation who should receive it. (Oxford English Dictionary, 2nd Ed., adapted).

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | deliveryPoint | [0..\*] | text |  |
| Attribute | cityName | [0..1] | text |  |
| Attribute | administrativeDivision | [0..1] | text |  |
| Attribute | country | [0..1] | text |  |
| Attribute | postalCode | [0..1] | text |  |

**Inherited Attributes**

### «ComplexAttributeType» surveyDateRange

The complex attribute describes the period of the hydrographic survey, as the time between its sub-attributes

**Attributes**

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateEnd | [1] | S100\_TruncatedDate | ISO 8601:2004 |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate | ISO 8601:2004 |

**Inherited Attributes**

## CodeLists

### «S100\_CodeList» IALA\_categoryOfAggregation

named aggregations between two or more aids to navigation and/or navigationally relevant features

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | leading line | A line passing through two or more clearly defined charted objects, and along which a vessel can approach safely. |
| Literal | range system | Two or more objects in line. Such objects are said to be in range. An observer having them in range is said to be on the range. |
| Literal | measured distance | A course at sea, whose ends are indicated by ranges ashore, and whose length has been accurately measured for determining the speed of vessels. |

### «S100\_CodeList» IALA\_categoryOfAssociation

named associations between two or more aids to navigation and/or navigationally relevant features

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | channel markings | A group of channel marks which indicate the channel limits |
| Literal | danger markings | One or more aids to navigation and the danger(s) they mark |

## Enumerated Types

### «Enumeration» IALA\_aidAvailabilityCategory

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | Category 1 | An AtoN or system of AtoN that is considered by the Competent Authority to be of vital navigational significance.  Recommendation O-130 – Categorisation and Availability Objectives for Short Range Aids to Navigation December 2004 - Revised June 2011 |
| Literal | Category 2 | An AtoN or system of AtoN that is considered by the Competent Authority to be of important navigational significance.  Recommendation O-130 – Categorisation and Availability Objectives for Short Range Aids to Navigation December 2004 - Revised June 2011 |
| Literal | Category 3 | An AtoN or system of AtoN that is considered by the Competent Authority to be of necessary navigational significance.  Recommendation O-130 – Categorisation and Availability Objectives for Short Range Aids to Navigation December 2004 - Revised June 2011 |

### «Enumeration» beaconShape

The shape a beacon exhibits

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | stake, pole, perch, post | an elongated wood or metal pole, embedded in the bottom to serve as a navigational aid or a support for a navigational aid. |
| Literal | withy | a tree without roots stuck or spoiled into the bottom of the sea to serve as a navigational aid. |
| Literal | beacon tower | a solid structure of the order of 10 metres in height used as a navigational aid. |
| Literal | lattice beacon | 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. |
| Literal | pile beacon | 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. |
| Literal | cairn | a mound of stones, usually conical or pyramidal, raised specifically for maritime navigation. |
| Literal | buoyant beacon | 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. |

### «Enumeration» buildingShape

The specific shape of the building.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | high-rise building | a building having many storeys. |
| Literal | pyramid | a polyhedron of which one face is a polygon of any number of sides, and the other faces are triangles with a common vertex. |
| Literal | cylindrical | 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. |
| Literal | spherical | shaped like a sphere, which is a body the surface of which is at all points equidistant from the centre. |
| Literal | cubic | a shape the sides of which are six equal squares a regular hexahedron. |

### «Enumeration» buoyShape

The shape a buoy exhibits.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | conical (nun, ogival) | 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. |
| Literal | can (cylindrical) | 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. |
| Literal | spherical | 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. |
| Literal | pillar | 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. |
| Literal | spar (spindle) | 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. |
| Literal | barrel (tun) | 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. |
| Literal | super-buoy | a very large buoy, generally more than 5m in diameter. |
| Literal | ice buoy | a specially constructed shuttle shaped buoy which is used in ice conditions. |

### «Enumeration» categoryOfCardinalMark

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

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | north cardinal mark | 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. |
| Literal | east cardinal mark | 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. |
| Literal | south cardinal mark | 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. |
| Literal | west cardinal mark | 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. |

### «Enumeration» categoryOfFogSignal

Classification of the various means of generating the fog signal.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | explosive | a signal produced by the firing of explosive charges. |
| Literal | diaphone | 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'. |
| Literal | siren | a siren uses compressed air and exists in a variety of types which differ considerably in their sound and power. |
| Literal | nautophone | a horn having a diaphragm oscillated by electricity |
| Literal | reed | a reed uses compressed air and emits a weak, high pitched sound. |
| Literal | tyfon | a diaphragm horn which operates under the influence of compressed air or steam |
| Literal | bell | a ringing sound with a short range. |
| Literal | whistle | a distinctive sound made by a jet of air passing through an orifice. |
| Literal | gong | a sound produced by vibration of a disc when struck. |
| Literal | horn | 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. |

### «Enumeration» categoryOfInstallationBuoy

Classification of fixed installation buoy

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | catenary anchor leg mooring (CALM) | 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. |
| Literal | single buoy mooring (SBM or SPM) | 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) |

### «Enumeration» categoryOfLandmark

Classification of prominent cultural and natural features in the landscape

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | cairn | a mound of stones, usually conical or pyramidal, raised as a landmark or to designate a point of importance in surveying. |
| Literal | cemetery | an area of land for burying the dead. |
| Literal | chimney | a vertical structure containing a passage or flue for discharging smoke and gases. |
| Literal | dish aerial | a parabolic aerial for the receipt and transmission of high frequency radio signals. |
| Literal | flagstaff (flagpole) | a staff or pole on which flags are raised. |
| Literal | flare stack | a tall structure used for burning-off waste oil or gas. Normally showing a flame and located at refineries. |
| Literal | mast | a straight vertical piece of timber or a hollow cylinder. |
| Literal | windsock | a tapered fabric sleeve mounted so as to catch and swing with the wind, thus indicating the wind direction. |
| Literal | monument | a structure erected or maintained as a memorial to a person or event. |
| Literal | column (pillar) | a cylindrical or slightly tapering body of considerably greater length than diameter erected vertically. |
| Literal | memorial plaque | a slab of metal, usually ornamented, erected as a memorial to a person or event. |
| Literal | obelisk | a tapering shaft usually of stone or concrete, square or rectangular in section, with a pyramidal apex. |
| Literal | statue | a representation of a human, animal or fantasy figure in marble, bronze, etc. |
| Literal | cross | a monument, or other structure in form of a cross. |
| Literal | dome | a landmark comprising a hemispherical or spheroidal shaped structure |
| Literal | radar scanner | a device used for directing a radar beam through a search pattern |
| Literal | tower | a relatively tall structure which may be used for observation, support, storage or communication etc. |
| Literal | windmill | a wind driven system of vanes attached to a tower like structure (excluding wind-generated power plants). |
| Literal | windmotor | a modern structure for the use of windpower. |
| Literal | spire/minaret | a tall conical or pyramid-shaped structure often built on the roof or tower of a building, especially a church or mosque. |
| Literal | large rock or boulder on land | an isolated rocky formation or a single large stone |

### «Enumeration» categoryOfLateralMark

Classification of lateral buoys

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | port-hand lateral mark | indicates the port boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. |
| Literal | starboard-hand lateral mark | indicates the starboard boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. |
| Literal | preferred channel to starboard lateral mark | 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. |
| Literal | preferred channel to port lateral mark | 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. |

### «Enumeration» categoryOfLight

Classification of different light types

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | directional function | a light illuminating a sector of very narrow angle and intended to mark a direction to follow. |
| Literal | leading light | a light associated with other lights so as to form a leading line to be followed. |
| Literal | aero light | an aero light is established for aeronautical navigation and may be of higher power than marine lights and visible from well offshore. |
| Literal | air obstruction light | a light marking an obstacle which constitutes a danger to air navigation. |
| Literal | fog detector light | a light used to automatically determine conditions of visibility which warrant the turning on or off of a sound signal. |
| Literal | flood light | a broad beam light used to illuminate a structure or area. |
| Literal | strip light | a light whose source has a linear form generally horizontal, which can reach a length of several metres. |
| Literal | subsidiary light | a light placed on or near the support of a main light and having a special use in navigation. |
| Literal | spotlight | a powerful light focused so as to illuminate a small area. |
| Literal | front | term used with leading lights to describe the position of the light on the lead as viewed from seaward. |
| Literal | rear | term used with leading lights to describe the position of the light on the lead as viewed from seaward. |
| Literal | lower | term used with leading lights to describe the position of the light on the lead as viewed from seaward. |
| Literal | upper | term used with leading lights to describe the position of the light on the lead as viewed from seaward. |
| Literal | moiré effect | a short range (up to 2km) type of directional light. Sodium lighting gives a yellow background to a screen on which a vertical black line will be seen by an observer on the centre line. |
| Literal | emergency | a light available as a backup to a main light which will be illuminated should the main light fail. |
| Literal | bearing light | a light which enables its approximate bearing to be obtained without the use of a compass. |
| Literal | horizontally disposed | a group of lights of identical character and almost identical position, that are disposed horizontally. |
| Literal | vertically disposed | a group of lights of identical character and almost identical position, that are disposed vertically. |

### «Enumeration» categoryOfNavigationLine

Classification of route guidance given to vessels

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | clearing line | a straight line that marks the boundary between a safe and a dangerous area or that passes clear of a navigational danger. |
| Literal | transit line | a line passing through one or more fixed marks. |
| Literal | leading line bearing a recommended track | 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. |

### «Enumeration» categoryOfOffshorePlatform

Classification of an offshore raised structure

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | oil derrick/rig | a temporary mobile structure, either fixed or floating, used in the exploration stages of oil and gas fields. |
| Literal | production platform | 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. |
| Literal | observation/research platform | a platform from which one's surroundings or events can be observed, noted or recorded such as for scientific study. |
| Literal | articulated loading platform (ALP) | 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. |
| Literal | single anchor leg mooring (SALM) | 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. |
| Literal | mooring tower | a platform secured to the sea bed and surmounted by a turntable to which ships moor. |
| Literal | artificial island | a man-made structure usually built for the exploration or exploitation of marine resources, marine scientific research, tidal observations, etc. |
| Literal | floating production, storage and off-loading vessel (FPSO) | an offshore oil/gas facility consisting of a moored tanker/barge by which the product is extracted, stored and exported. |
| Literal | accommodation platform | a platform used primarily for eating, sleeping and recreation purposes. |
| Literal | navigation, communication and control buoy (NCCB) | a floating structure with control room, power and storage facilities, attached to the sea bed by a flexible pipeline and cables. |

### «Enumeration» categoryOfPile

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

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | stake | an elongated wood or metal pole embedded in the bottom to serve as a marker or support. |
| Literal | post | a vertical piece of timber, metal or concrete forced into the earth or sea bed. |
| Literal | tripodal | 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. |

### «Enumeration» categoryOfRadarTransponderBeacon

Classification of radar transponder beacon based on fuctionality.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | ramark, radar beacon transmitting continuously | 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. |
| Literal | racon, radar transponder beacon | 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. |
| Literal | leading racon/radar transponder beacon | a radar beacon that may be used (in conjunction with at least one other radar beacon) to indicate a leading line. |

### «Enumeration» categoryOfRecommendedTrack

Classification of track based on defining navigational marks

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | based on a system of fixed marks | 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. |
| Literal | not based on a system of fixed marks | a route (known as a recommended track or preferred route) which is not based on a series of structures or features in line. |

### «Enumeration» categoryOfSiloTank

Classification based on the product

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | silo in general | a generally cylindrical tower used for storing fodder or grain. |
| Literal | tank in general | a fixed structure for storing liquids. |
| Literal | grain elevator | a storage building for grain. Usually a tall frame, metal or concrete structure with an especially compartmented interior. |
| Literal | water tower | a tower with an elevated container used to hold water. |

### «Enumeration» categoryOfSpecialPurposeMark

Classification of an aid to navigation which signifies some special purpose

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | firing danger area mark | a mark used to indicate a firing danger area, usually at sea. |
| Literal | target mark | any object toward which something is directed. The distinctive marking or instrumentation of a ground point to aid its identification on a photograph. |
| Literal | marker ship mark | a mark marking the position of a ship which is used as a target during some military exercise. |
| Literal | degaussing range mark | a mark used to indicate a degaussing range. |
| Literal | barge mark | a mark of relevance to barges. |
| Literal | cable mark | a mark used to indicate the position of submarine cables or the point at which they run on to the land. |
| Literal | spoil ground mark | a mark used to indicate the limit of a spoil ground |
| Literal | outfall mark | a mark used to indicate the position of an outfall or the point at which it leaves the land. |
| Literal | ODAS (Ocean-Data-Acquisition-System) | Ocean Data Acquisition System |
| Literal | recording mark | a mark used to record data for scientific purposes. |
| Literal | seaplane anchorage mark | a mark used to indicate a seaplane anchorage. |
| Literal | recreation zone mark | a mark used to indicate a recreation zone. |
| Literal | private mark | a privately maintained mark. |
| Literal | mooring mark | a mark indicating a mooring or moorings. |
| Literal | LANBY (Large Automatic Navigational Buoy) | a large buoy designed to take the place of a lightship where construction of an offshore light station is not feasible. |
| Literal | leading mark | 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. |
| Literal | measured distance mark | a mark forming part of a transit indicating one end of a measured distance. |
| Literal | notice mark | a notice board or sign indicating information to the mariner. |
| Literal | TSS mark (Traffic Separation Scheme) | a mark indicating a traffic separation scheme. |
| Literal | anchoring prohibited mark | a mark indicating an anchoring prohibited area. |
| Literal | berthing prohibited mark | a mark indicating that berthing is prohibited. |
| Literal | overtaking prohibited mark | a mark indicating that overtaking is prohibited. |
| Literal | two-way traffic prohibited mark | a mark indicating a one-way route. |
| Literal | reduced wake mark | a mark indicating that vessels must not generate excessive wake. |
| Literal | speed limit mark | a mark indicating that a speed limit applies. |
| Literal | stop mark | a mark indicating the place where the bow of a ship must stop when traffic lights show red. |
| Literal | general warning mark | a mark indicating that special caution must be exercised in the vicinity of the mark. |
| Literal | sound ship's siren mark | a mark indicating that a ship should sound its siren or horn. |
| Literal | restricted vertical clearance mark | a mark indicating the minimum vertical space available for passage. |
| Literal | maximum vessel's draught mark | a mark indicating the maximum draught of vessel permitted. |
| Literal | restricted horizontal clearance mark | a mark indicating the minimum horizontal space available for passage. |
| Literal | strong current warning mark | a mark warning of strong currents. |
| Literal | berthing permitted mark | a mark indicating that berthing is allowed. |
| Literal | overhead power cable mark | a mark indicating an overhead power cable. |
| Literal | channel edge gradient mark | a mark indicating the gradient of the slope of a dredge channel edge. |
| Literal | telephone mark | a mark indicating the presence of a telephone. |
| Literal | ferry crossing mark | a mark indicating that a ferry route crosses the ship route often used with a 'sound ship's siren' mark. |
| Literal | pipeline mark | a mark used to indicate the position of submarine pipelines or the point at which they run on to the land. |
| Literal | anchorage mark | a mark indicating an anchorage area. |
| Literal | clearing mark | a mark used to indicate a clearing line. |
| Literal | control mark | a mark indicating the location at which a restriction or requirement exists. |
| Literal | diving mark | a mark indicating that diving may take place in the vicinity. |
| Literal | refuge beacon | a mark providing or indicating a place of safety. |
| Literal | foul ground mark | a mark indicating a foul ground. |
| Literal | yachting mark | a mark installed for use by yachtsmen. |
| Literal | heliport mark | a mark indicating an area where helicopters may land. |
| Literal | GPS mark | a mark indicating a location at which a GNSS position has been accurately determined. |
| Literal | seaplane landing mark | a mark indicating an area where sea-planes land. |
| Literal | entry prohibited mark | a mark indicating that entry is prohibited. |
| Literal | work in progress mark | a mark indicating that work (generally construction) is in progress. |
| Literal | mark with unknown purpose | a mark whose detailed characteristics are unknown. |
| Literal | wellhead mark | a mark indicating a borehole that produces or is capable of producing oil or natural gas. |
| Literal | channel separation mark | a mark indicating the point at which a channel divides separately into two channels. |
| Literal | marine farm mark | a mark indicating the existence of a fish, mussel, oyster or pearl farm/ culture. |
| Literal | artificial reef mark | a mark indicating the existence or the extent of an artificial reef. |
| Literal | IALA\_jetski prohibited | A mark indicating a jetski prohibited area |

### «Enumeration» categoryOfTemporalVariation

An assessment of the likelihood of change within an area since last

survey.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | unassessed | Temporal variation not assessed or cannot be determined |
| Literal | event | No new hydrographic survey conducted after an event (e.g. hurricane, earthquake, volcanic eruption, landslide, etc), which is considered likely to have changed the seafloor significantly. |
| Literal | likely to change | Continuous or frequent change (e.g. river siltation, sand waves, seasonal storms, ice bergs, etc). |
| Literal | likely to change, but significant shoaling unlikely | Likely to change but significant shoaling unlikely |
| Literal | unlikely to change | Significant change to the seafloor is not expected. |

### «Enumeration» colour

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

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | white |  |
| Literal | black |  |
| Literal | red |  |
| Literal | green |  |
| Literal | blue |  |
| Literal | yellow |  |
| Literal | grey |  |
| Literal | brown |  |
| Literal | amber |  |
| Literal | violet |  |
| Literal | orange |  |
| Literal | magenta |  |
| Literal | pink |  |

### «Enumeration» colourPattern

A regular repeated design containing more than one colour

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | horizontal stripes | Straight bands or stripes of differing colours oriented horizontally. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.113, November 2000). |
| Literal | vertical stripes | Straight bands or stripes of differing colours oriented vertically. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.113, November 2000). |
| Literal | diagonal stripes | Straight bands or stripes of differing colours oriented diagonally (i.e. not horizontally or vertically). (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.113, November 2000). |
| Literal | squared | 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. (S-57 Edition 3.1, Appendix A  – Chapter 2, Page 2.113, November 2000). |
| Literal | stripes (direction unknown) | Straight bands or stripes of differing colours oriented in an unknown direction. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.113, November 2000). |
| Literal | border stripe | A band or stripe of colour which is displayed around the outer edge of the feature, which may also form a border to an inner pattern or plain colour. (S-57 Edition 3.1, Appendix A – Chapter 2,  Page 2.113, November 2000). |
| Literal | IALA\_single colour | One solid colour of uniform coverage |
| Literal | IALA\_rectangle | A four-sided shape that is made up of two pairs of parallel lines and that has four right angles, on a different coloured background |
| Literal | IALA\_triangle | a shape that is made up of three lines and three angles, on a different coloured background |

### «Enumeration» condition

The various conditions of buildings and other constructions.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | under construction |  |
| Literal | ruined |  |
| Literal | under reclamation |  |
| Literal | wingless |  |
| Literal | planned construction |  |

### «Enumeration» exhibitionConditionOfLight

The outward display of the light

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | light shown without change of character | a light shown throughout the 24 hours without change of character. |
| Literal | daytime light | a light which is only exhibited by day. |
| Literal | fog light | a light which is exhibited in fog or conditions of reduced visibility. |
| Literal | night light | a light which is only exhibited at night. |

### «Enumeration» function

A specific role that describes a feature

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | harbour-master's office |  |
| Literal | custom office |  |
| Literal | health office |  |
| Literal | hospital |  |
| Literal | post office |  |
| Literal | hotel |  |
| Literal | railway station |  |
| Literal | police station |  |
| Literal | water-police station |  |
| Literal | pilot office |  |
| Literal | pilot lookout |  |
| Literal | bank office |  |
| Literal | headquarters for district control |  |
| Literal | transit shed/warehouse |  |
| Literal | factory |  |
| Literal | power station |  |
| Literal | administrative |  |
| Literal | educational facility |  |
| Literal | church |  |
| Literal | chapel |  |
| Literal | temple |  |
| Literal | pagoda |  |
| Literal | shinto shrine |  |
| Literal | buddhist temple |  |
| Literal | mosque |  |
| Literal | marabout |  |
| Literal | lookout |  |
| Literal | communication |  |
| Literal | television |  |
| Literal | radio |  |
| Literal | radar |  |
| Literal | light support |  |
| Literal | microwave |  |
| Literal | cooling |  |
| Literal | observation |  |
| Literal | timeball |  |
| Literal | clock |  |
| Literal | control |  |
| Literal | airship mooring |  |
| Literal | stadium |  |
| Literal | bus station |  |

### «Enumeration» lightCharacteristic

The typical behaviour associated with the light

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | fixed |  |
| Literal | flashing |  |
| Literal | long-flashing |  |
| Literal | quick-flashing |  |
| Literal | very quick-flashing |  |
| Literal | ultra quick-flashing |  |
| Literal | isophased |  |
| Literal | occulting |  |
| Literal | interrupted quick-flashing |  |
| Literal | interrupted very quick-flashing |  |
| Literal | interrupted ultra quick-flashing |  |
| Literal | morse |  |
| Literal | fixed/flash |  |
| Literal | flash/long-flash |  |
| Literal | occulting/flash |  |
| Literal | fixed/long-flash |  |
| Literal | occulting alternating |  |
| Literal | long-flash alternating |  |
| Literal | flash alternating |  |
| Literal | group alternating |  |
| Literal | quick-flash plus long-flash |  |
| Literal | very quick-flash plus long-flash |  |
| Literal | ultra quick-flash plus long-flash |  |
| Literal | alternating |  |
| Literal | fixed and alternating flashing |  |

### «Enumeration» lightVisibility

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

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | high intensity |  |
| Literal | low intensity |  |
| Literal | faint |  |
| Literal | intensified |  |
| Literal | unintensified |  |
| Literal | visibility deliberately restricted |  |
| Literal | obscured |  |
| Literal | partially obscured |  |

### «Enumeration» marksNavigationalSystemOf

The system of navigational buoyage a region complies with.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | IALA A |  |
| Literal | IALA B |  |
| Literal | no system |  |
| Literal | other system |  |

### «Enumeration» natureOfConstruction

The buildings primary construction material

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | masonry |  |
| Literal | concreted |  |
| Literal | loose boulders |  |
| Literal | hard surfaced |  |
| Literal | unsurfaced |  |
| Literal | wooden |  |
| Literal | metal |  |
| Literal | glass reinforced plastic (GRP) |  |
| Literal | painted |  |
| Literal | IALA\_fiberglass | Constructed from fiberglass |
| Literal | IALA\_plastic | Constructed from plastic |

### «Enumeration» product

The various substances which are transported, stored or exploited.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | oil |  |
| Literal | gas |  |
| Literal | water |  |
| Literal | stone |  |
| Literal | coal |  |
| Literal | ore |  |
| Literal | chemicals |  |
| Literal | drinking water |  |
| Literal | milk |  |
| Literal | bauxite |  |
| Literal | coke |  |
| Literal | iron ingots |  |
| Literal | salt |  |
| Literal | sand |  |
| Literal | timber |  |
| Literal | sawdust/wood chips |  |
| Literal | scrap metal |  |
| Literal | liquified natural gas (LNG) |  |
| Literal | liquified petroleum gas (LPG) |  |
| Literal | wine |  |
| Literal | cement |  |
| Literal | grain |  |

### «Enumeration» qualityOfPosition

The degree of reliability attributed to a position

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | surveyed |  |
| Literal | unsurveyed |  |
| Literal | inadequately surveyed |  |
| Literal | approximate |  |
| Literal | position doubtful |  |
| Literal | unreliable |  |
| Literal | reported (not surveyed) |  |
| Literal | reported (not confirmed) |  |
| Literal | estimated |  |
| Literal | precisely known |  |
| Literal | calculated |  |

### «Enumeration» qualityOfSoundingMeasurement

The reliability of the value of a sounding.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | depth known |  |
| Literal | depth unknown |  |
| Literal | doubtful sounding |  |
| Literal | unreliable sounding |  |
| Literal | no bottom found at value shown |  |
| Literal | least depth known |  |
| Literal | least depth unknown, safe clearance at value shown |  |
| Literal | value reported (not surveyed) |  |
| Literal | value reported (not confirmed) |  |
| Literal | maintained depth |  |
| Literal | not regularly maintained |  |

### «Enumeration» radarConspicuous

A feature which returns a strong radar echo.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | radar conspicuous |  |
| Literal | not radar conspicuous |  |
| Literal | radar conspicuous (has radar reflector) |  |

### «Enumeration» signalGeneration

The mechanism used to generate a fog signal.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | automatically |  |
| Literal | by wave action |  |
| Literal | by hand |  |
| Literal | by wind |  |

### «Enumeration» status

The condition of an object at a given instant in time.

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | permanent |  |
| Literal | occasional |  |
| Literal | recommended |  |
| Literal | not in use |  |
| Literal | periodic/intermittent |  |
| Literal | reserved |  |
| Literal | temporary |  |
| Literal | private |  |
| Literal | mandatory |  |
| Literal | extinguished |  |
| Literal | illuminated |  |
| Literal | historic |  |
| Literal | public |  |
| Literal | synchronized |  |
| Literal | watched |  |
| Literal | un-watched |  |
| Literal | existence doubtful |  |
| Literal | IALA\_confirmed | made certain as to truth, accuracy, validity, availability, etc. - www.dictionary.com |
| Literal | IALA\_candidate | Item selected for an action |
| Literal | IALA\_under modification | Item that is in the process of being modified |
| Literal | IALA\_candidate for modification | Item selected for modification |
| Literal | IALA\_under removal/deletion | Item in the process of being removed or deleted |
| Literal | IALA\_removed/deleted | Item that has been removed or deleted |

### «Enumeration» techniqueOfSoundingMeasurement

Survey method used to obtain depth information

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | found by echo-sounder |  |
| Literal | found by side scan sonar |  |
| Literal | found by multi-beam |  |
| Literal | found by diver |  |
| Literal | found by lead-line |  |
| Literal | swept by wire-drag |  |
| Literal | found by laser |  |
| Literal | swept by vertical acoustic system |  |
| Literal | found by electromagnetic sensor |  |
| Literal | photogrammetry |  |
| Literal | satellite imagery |  |
| Literal | found by levelling |  |
| Literal | swept by side-scan sonar |  |
| Literal | computer generated |  |

### «Enumeration» topmarkDaymarkShape

The shape a topmark or day mark exhibits

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | cone, point up |  |
| Literal | cone, point down |  |
| Literal | sphere |  |
| Literal | 2 spheres |  |
| Literal | cylinder (can) |  |
| Literal | board |  |
| Literal | x-shape (St. Andrew's cross) |  |
| Literal | upright cross (St George's cross) |  |
| Literal | cube, point up |  |
| Literal | 2 cones, point to point |  |
| Literal | 2 cones, base to base |  |
| Literal | rhombus (diamond) |  |
| Literal | 2 cones (points upward) |  |
| Literal | 2 cones (points downward) |  |
| Literal | besom, point up (broom or perch) |  |
| Literal | besom, point down (broom or perch) |  |
| Literal | flag |  |
| Literal | sphere over rhombus |  |
| Literal | square |  |
| Literal | rectangle, horizontal | where the two longer opposite sides are standing horizontally. A rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length |
| Literal | rectangle, vertical | where the two longer opposite sides are standing vertically. A rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length |
| Literal | trapezium, up |  |
| Literal | trapezium, down |  |
| Literal | triangle, point up |  |
| Literal | triangle, point down |  |
| Literal | circle |  |
| Literal | two upright crosses (one over the other) |  |
| Literal | T-shape |  |
| Literal | triangle pointing up over a circle |  |
| Literal | upright cross over a circle |  |
| Literal | rhombus over a circle |  |
| Literal | circle over a triangle pointing up |  |
| Literal | other shape |  |
| Literal | IALA\_tubular |  |

### «Enumeration» trafficFlow

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | inbound |  |
| Literal | outbound |  |
| Literal | one-way |  |
| Literal | two-way |  |

### «Enumeration» verticalDatum

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

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | Mean low water springs |  |
| Literal | Mean lower low water springs |  |
| Literal | Mean sea level |  |
| Literal | Lowest low water |  |
| Literal | Mean low water |  |
| Literal | Lowest low water springs |  |
| Literal | Approximate mean low water springs |  |
| Literal | Indian spring low water |  |
| Literal | Low water springs |  |
| Literal | Approximate lowest astronomical tide |  |
| Literal | Nearly lowest low water |  |
| Literal | Mean lower low water |  |
| Literal | Low water |  |
| Literal | Approximate mean low water |  |
| Literal | Approximate mean lower low water |  |
| Literal | Mean high water |  |
| Literal | Mean high water springs |  |
| Literal | High water |  |
| Literal | Approximate mean sea level |  |
| Literal | High water springs |  |
| Literal | Mean higher high water |  |
| Literal | Equinoctial spring low water |  |
| Literal | Lowest astronomical tide |  |
| Literal | Local datum |  |
| Literal | International Great Lakes Datum 1985 |  |
| Literal | Mean water level |  |
| Literal | Lower low water large tide |  |
| Literal | Higher high water large tide |  |
| Literal | Nearly highest high water |  |
| Literal | Highest astronomical tide (HAT) |  |

### «Enumeration» visuallyConspicuous

Relating to a features ability to be clearly seen and identified

**Listed Values**

| *Role Name* | *Name* | *Description / Remarks* |
| --- | --- | --- |
| Literal | visually conspicuous |  |
| Literal | not visually conspicuous |  |