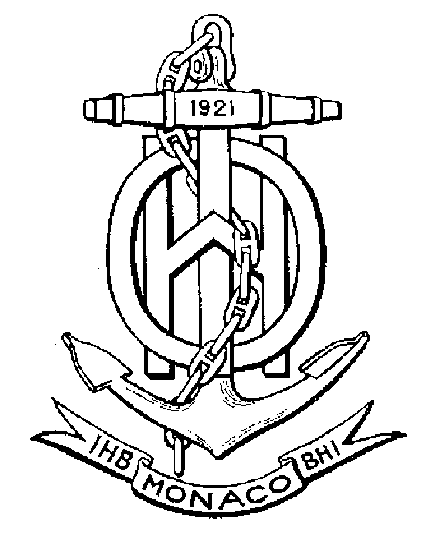
**INTERNATIONAL HYDROGRAPHIC ORGANIZATION**



**IHO UNIVERSAL HYDROGRAPHIC DATA MODEL**

Version 1.0.0

Draft - April 30 2017

**Special Publication No. 123**

**Marine Protected Area Product Specification**

**Appendix B**

**Application Schema Documentation**

Published by the

International Hydrographic Bureau

**MONACO**

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| --- |
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S-123 Application Schema

# S-123 Domain Model

## Features

### FeatureType

**Class Feature Super-type:**

Generalized feature type which carry all the common attributes

Spatial Primitive: None

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Inherited Attributes

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| associatedRxN  *Association* | *Label:* FeatureType  *Role:* appliesInLocation  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* AbstractRXN  *Role:* theRxN  *Multiplicity:* 0..\*  Ordered: 0 |  |
| textAssociation  *Association* | *Label:* FeatureType  *Role:* identifies  *Multiplicity:* 0..1  Ordered: 0 | *Label:* TextPlacement  *Role:* positions  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between a geo feature and the cartographically positioned location for text. |
| additionalInformation  *Association* | *Label:* FeatureType  *Role:* informationProvidedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* NauticalInformation  *Role:* providesInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |
| PermissionType  *AssociationClass* | *Label:* FeatureType  *Role:* vslLocation  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Applicability  *Role:* permission  *Multiplicity:* 0..\*  Ordered: 0 |  |

### Building

**Class Feature Super-type: FeatureType**

A free-standing self-supporting construction that is roofed, usually walled, and is intended for human occupancy (for example: a place of work or recreation) and/or habitation. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010)

S-123 Note: Only buildings with functions relevant to radiocommunications are encoded in S-123 datasets.

Spatial Primitive: Point, Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | function | [0..\*] | function | 29: communication  31: radio  34: microwave  39: control  44: sea rescue control |
| Attribute | status | [0..\*] | status |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

### CoastguardStation

**Class Feature Super-type: FeatureType**

A station at which a visual/radio/radar marine watch is kept either continuously or at certain times only.

S-123 Note: Only those instances concerned to radio communications are encoded in S-123 datasets.

*Constraint*: MRCC information/text = "Maritime Rescue and Coordination Centre"

Spatial Primitive: Point, Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | communicationChannel | [0..\*] | text |  |
| Attribute | isMRCC | [0..1] | Boolean | In S-123 datasets, only MRCC or MRSC coastguard stations are encoded, so the value of this attribute should be TRUE for all instances in an S-123 dataset. |
| Attribute | status | [0..\*] | status | 1: permanent  4: not in use  5: periodic/intermittent  16: watched  17: un-watched |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* CoastguardStation  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvContact  *Association* | *Label:* CoastguardStation  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 |  |
| locationHours  *Association* | *Label:* CoastguardStation  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 |  |

### GMDSSArea

**Class Feature Super-type: FeatureType**

An area defined for a global communications service based upon automated systems, both satellite based and terrestrial, to provide distress alerting and promulgation of maritime safety information for mariners. (Adapted IHO Dictionary, S-32, 5th Edition, 2048)

Spatial Primitive: Surface

#### Attributes

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

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* GMDSSArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |

### InmarsatOceanRegionArea

**Class Feature Super-type: FeatureType**

The ocean region of the earth’s surface, within which a station can obtain line-of-sight communication, with an Inmarsat satellite.

Spatial Primitive: Surface

#### Attributes

(None)

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* InmarsatOceanRegionArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |

### Landmark

**Class Feature Super-type: FeatureType**

Any prominent object on land which can be used in determining a location or a direction. (IHO Dictionary – S-32).

S-123 Note: Only features relevant to radio communications are encoded e.g., radio towers or radio masts. If the feature can be encoded as a radio station at the same location, a coincident Landmark must not be encoded.

Spatial Primitive: Point, Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfLandmark | [1..\*] | categoryOfLandmark |  |
| Attribute | function | [0..\*] | function |  |
| Attribute | status | [0..\*] | status |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

### NavigationalMeteorologicalArea

**Class Feature Super-type: FeatureType**

The geographic areas in which various governments are responsible for navigation and weather warnings.

Remarks: The roman number of NAV/METAREA is to be coded by using the feature name attribute. NAVTEX transmitting station identification characters are allocated within the same areas.

Spatial Primitive: Surface

#### Attributes

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

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* NavigationalMeteorologicalArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |

### NavtexStationArea

**Class Feature Super-type: FeatureType**

The geographic areas in which radio stations are responsible for broadcast navigation and weather warnings.

Spatial Primitive: Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | txIdentChar | [1] | text | The NAVTEX transmitter identification character is a single unique letter, which is allocated to each transmitter. It is used to identify the broadcasts, which are to be accepted by the receiver, those which are to be rejected, and the time slot for the transmission.  Remarks: The transmitter identification character should be indicated by a single character (A-Z) |
| Attribute | restriction | [0..1] | restriction |  |
| Attribute | status | [0..1] | status |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* NavtexStationArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |

### RadioServiceArea

**Class Feature Super-type: FeatureType**

The area where a radio service can be obtained and the characteristics of the radio transmission.

Remarks: The objects RDOSTA; RADSTA are used to encode the point of transmission of the signal.

Spatial Primitive: Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | callSign | [0..1] | text |  |
| Attribute | categoryOfBroadcastCommunication | [1] | categoryOfBroadcastCommunication |  |
| Attribute | languageInformation | [0..1] | text | A description of the languages, alphabets and scripts in use. |
| Complex Attribute | radiocommunications | [0..\*] | radiocommunications |  |
| Attribute | status | [0..1] | status |  |
| Complex Attribute | timeReference | [0..1] | timeReference |  |
| Attribute | transmissionPower | [0..1] | Real | The maximum power the radio service uses (or is authorized to use) for radio transmission.  Remark: The calculation of the power depends on the type of signal. The value encoded must be the actual transmission power, if this is known to be different from the authorized transmission power.  Unit: watt; Resolution: 0.1  Reference: 47 CFR 80.215 (19 April 2017), adapted. |
| Attribute | txIdentChar | [0..1] | text | The NAVTEX transmitter identification character is a single unique letter, which is allocated to each transmitter. It is used to identify the broadcasts, which are to be accepted by the receiver, those which are to be rejected, and the time slot for the transmission.  Remarks: The transmitter identification character should be indicated by a single character (A-Z) |
| Attribute | txTrafficList | [0..1] | Boolean | Describes whether a station transmits traffic lists.  Remarks:   * True: The radio station transmits traffic lists. * False: The radio station does not transmit traffic lists. |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| locationHours  *Association* | *Label:* RadioServiceArea  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 | Service hours for a physical facility, area, or location-based service |
| srvControl  *Association* | *Label:* RadioServiceArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvContact  *Association* | *Label:* RadioServiceArea  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 | Contact details for a service or facility |
| coreAggregation  *Aggregation* | *Label:* RadioServiceArea  *Role:* consistsOf  *Multiplicity:*  Ordered: 0 | *Label:* RadioServiceAreaAggregate  *Role:* componentOf  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and a geographic feature describing the service or phenomenon. (IHO). |
| serviceProvisionArea  *Association* | *Label:* RadioStation  *Role:* serviceProvider  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* RadioServiceArea  *Role:* serviceArea  *Multiplicity:* 0..\*  Ordered: 0 | Association linking the location from which a service is provided and the area(s) served.  Remark: This is a feature association linking a provider described by a geographic feature with the area served (another geographic feature). Contrast to srvControl, which is an information association linking the area served to an information object describing the provider. |

### RadioStation

**Class Feature Super-type: FeatureType**

A place equipped to transmit radio waves.

Remarks: Such a station may be either stationary or mobile, and may also be provided with a radio receiver. In British terminology, also called 'w/t station'. The transmission of a radio station may serve to provide mariners with a line of position (IHO Chart Specifications, M-4). The object 'radio station' is used to encode the point of transmission of the signal.

S-123 remarks: (1) The area in which the radio service can be obtained is described by an RDOSVC object. (2) The S-123 definition differs from the 2016 S-101 definition by omitting the optional attribute **communicationChannel** (bound to the NPUBs domain complex attribute **radioStationCommunicationDescription** instead). The NPUBs domain feature also binds attribute **orientation** to RadioStation.

Spatial Primitive: Point

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | callSign | [0..1] | text |  |
| Attribute | categoryOfRadioStation | [0..1] | categoryOfRadioStation |  |
| Attribute | estimatedRangeOfTransmission | [0..1] | Real | The estimated range of a non-optical electromagnetic transmission. |
| Complex Attribute | orientation | [0..1] | orientation |  |
| Complex Attribute | radioStationCommunicationDescription | [0..\*] | radioStationCommunicationDescription |  |
| Attribute | status | [0..1] | status |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| locationHours  *Association* | *Label:* RadioStation  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 |  |
| serviceProvisionArea  *Association* | *Label:* RadioStation  *Role:* serviceProvider  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* RadioServiceArea  *Role:* serviceArea  *Multiplicity:* 0..\*  Ordered: 0 | Association linking the location from which a service is provided and the area(s) served.  Remark: This is a feature association linking a provider described by a geographic feature with the area served (another geographic feature). Contrast to srvControl, which is an information association linking the area served to an information object describing the provider. |
| srvControl  *Association* | *Label:* RadioStation  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvContact  *Association* | *Label:* RadioStation  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 | Contact details for a service or facility |

### WeatherForecastWarningArea

**Class Feature Super-type: FeatureType**

An area for which weather forecasts and warnings are provided for specified periods.

Spatial Primitive: Surface

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfFrcstAndWarningArea | [1] | categoryOfFrcstAndWarningArea |  |
| Attribute | nationality | [0..1] | ISO3166-1-alpha2 |  |
| Attribute | status | [0..1] | status |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvControl  *Association* | *Label:* WeatherForecastWarningArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| coreAggregation  *Aggregation* | *Label:* WeatherForecastWarningArea  *Role:* consistsOf  *Multiplicity:*  Ordered: 0 | *Label:* ForecastAreaAggregate  *Role:* componentOf  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and a geographic feature describing the service or phenomenon. (IHO). |

## Information Types

### InformationType

**Class Information Type Super-type:**

Generalized information type which carry all the common attributes

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Inherited Attributes

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| additionalInformation  *Association* | *Label:* InformationType  *Role:* informationProvidedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* NauticalInformation  *Role:* providesInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |

### AbstractRXN

**Class Information Type Super-type: InformationType**

An abstract superclass for the Quartet information types

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |
| Complex Attribute | graphic | [0..\*] | graphic |  |
| Complex Attribute | rxnCode | [0..\*] | rxnCode |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| InclusionType  *AssociationClass* | *Label:* AbstractRXN  *Role:* theApplicableRXN  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Applicability  *Role:* isApplicableTo  *Multiplicity:* 0..\*  Ordered: 0 |  |
| relatedOrganisation  *Association* | *Label:* Authority  *Role:* theOrganisation  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* AbstractRXN  *Role:* theInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |
| associatedRxN  *Association* | *Label:* FeatureType  *Role:* appliesInLocation  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* AbstractRXN  *Role:* theRxN  *Multiplicity:* 0..\*  Ordered: 0 |  |

### Applicability

**Class Information Type Super-type: InformationType**

Describes the relationship between vessel characteristics and: (i) the applicability of an associated information object or feature to the vessel; or, (ii) the use of a facility, place, or service by the vessel; or, (iii) passage of the vessel through an area.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | ballast | [0..1] | Boolean | Whether the vessel is in ballast.  Remarks:  True: Vessel is predominantly empty of cargo and stabilised with the use of ballast water  False: Vessel is carrying cargo and is not ballasted. |
| Attribute | categoryOfCargo | [0..\*] | categoryOfCargo |  |
| Attribute | categoryOfDangerousOrHazardousCargo | [0..\*] | categoryOfDangerousOrHazardousCargo |  |
| Attribute | categoryOfVessel | [0..1] | categoryOfVessel |  |
| Attribute | categoryOfVesselRegistry | [0..1] | categoryOfVesselRegistry |  |
| Attribute | logicalConnectives | [0..1] | logicalConnectives |  |
| Attribute | thicknessOfIceCapability | [0..1] | Integer | The thickness of ice that the ship can safely transit  Unit: centimetres  Resolution: 1  Format: xxx  Example: 080 for ice which has a thickness of 80 cm |
| Complex Attribute | information | [0..\*] | information |  |
| Attribute | vesselPerformance | [0..1] | text | A description of the required handling characteristics of a vessel including hull design, main and auxilliary machinery, cargo handling equipment, navigation equipment and manoeuvring behaviour. |
| Complex Attribute | vesselsMeasurements | [0..\*] | vesselsMeasurements |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| InclusionType  *AssociationClass* | *Label:* AbstractRXN  *Role:* theApplicableRXN  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Applicability  *Role:* isApplicableTo  *Multiplicity:* 0..\*  Ordered: 0 |  |
| reportReqmt  *Association* | *Label:* ShipReport  *Role:* theShipReport  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Applicability  *Role:* mustBeFiledBy  *Multiplicity:* 0..\*  Ordered: 0 |  |
| PermissionType  *AssociationClass* | *Label:* FeatureType  *Role:* vslLocation  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Applicability  *Role:* permission  *Multiplicity:* 0..\*  Ordered: 0 |  |

### Authority

**Class Information Type Super-type: InformationType**

A person or organisation having political or administrative power and control. (Oxford Dictionary of English)

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [1] | categoryOfAuthority |  |
| Complex Attribute | textContent | [0..1] | textContent |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| authorityHours  *Association* | *Label:* Authority  *Role:* theAuthority\_srvHrs  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..\*  Ordered: 0 | Service hours for an authority |
| relatedOrganisation  *Association* | *Label:* Authority  *Role:* theOrganisation  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* AbstractRXN  *Role:* theInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |
| authorityContact  *Association* | *Label:* Authority  *Role:* theAuthority  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 |  |
| srvControl  *Association* | *Label:* RadioServiceArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* CoastguardStation  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* NavigationalMeteorologicalArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* WeatherForecastWarningArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* NavtexStationArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* RadioStation  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* GMDSSArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |
| srvControl  *Association* | *Label:* InmarsatOceanRegionArea  *Role:* controlledService  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* Authority  *Role:* controlAuthority  *Multiplicity:* 0..\*  Ordered: 0 | Association between a geographically located service and the organisation that controls it |

### ContactDetails

**Class Information Type Super-type: InformationType**

Information on how to reach a person or organisation by postal, internet, telephone, telex and radio systems.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | callName | [0..1] | text | The designated call name of a station, e.g. radio station, radar station, pilot. This is the name used when calling a radio station by radio i.e. "Singapore Pilots". |
| Attribute | callSign | [0..1] | text | The designated call-sign of a radio station. |
| Attribute | communicationChannel | [0..\*] | text |  |
| Complex Attribute | contactAddress | [0..\*] | contactAddress |  |
| Complex Attribute | frequencyPair | [0..\*] | frequencyPair |  |
| Attribute | contactInstructions | [0..1] | text | supplemental instructions on how or when to contact the individual, organisation, or service |
| Complex Attribute | information | [0..\*] | information |  |
| Attribute | mMSICode | [0..1] | int | The Maritime Mobile Service Identity (MMSI) Code is formed of a series of nine digits which are transmitted over the radio path in order to uniquely identify ship stations, ship earth stations, coast stations, coast earth stations, and group calls. These identities are formed in such a way that the identity or part thereof can be used by telephone and telex subscribers connected to the general telecommunications network principally to call ships automatically. |
| Complex Attribute | onlineResource | [0..\*] | onlineResource | Information about online sources from which a resource or data can be obtained (ISO 19115, adapted) |
| Complex Attribute | telecommunications | [0..\*] | telecommunications | information for contact by means of a telecommunications service.  Distinctions: emailAddress, internetAddress, callName, callSign, COMCHA |
| Complex Attribute | radiocommunications | [0..\*] | radiocommunications | When bound to ContactDetails, only the listed sub-attributes may be used:   * communicationChannel * contactinstructions * frequencypair * categoryOfChannelOrFrequencyPreference * categoryOfRadioMethods * tmIntervalsByDoW |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| srvContact  *Association* | *Label:* CoastguardStation  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 |  |
| srvContact  *Association* | *Label:* RadioServiceArea  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 | Contact details for a service or facility |
| srvContact  *Association* | *Label:* RadioStation  *Role:* servicePlace  *Multiplicity:* 0..1  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 | Contact details for a service or facility |
| authorityContact  *Association* | *Label:* Authority  *Role:* theAuthority  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* ContactDetails  *Role:* theContactDetails  *Multiplicity:* 0..\*  Ordered: 0 |  |

### NauticalInformation

**Class Information Type Super-type: AbstractRXN**

Nautical information about a related area or facility.

Constraint: If **Regulations.textContent** is populated, there cannot be **textualDescription** or **information** attributes directly bound to the **Regulations**.. A similar constraint applies to the information types **Recommendations**, **Restrictions**, and **NauticalInformation**.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Complex Attribute | graphic | [0..\*] | graphic |  |
| Complex Attribute | rxnCode | [0..\*] | rxnCode |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| additionalInformation  *Association* | *Label:* InformationType  *Role:* informationProvidedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* NauticalInformation  *Role:* providesInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |
| additionalInformation  *Association* | *Label:* FeatureType  *Role:* informationProvidedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* NauticalInformation  *Role:* providesInformation  *Multiplicity:* 0..\*  Ordered: 0 |  |

### NonStandardWorkingDay

**Class Information Type Super-type: InformationType**

Days when many services are not available. Often days of festivity or recreation when normal working hours are limited, esp. a national or religious festival, etc.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateFixed | [0..\*] | S100\_TruncatedDate | The date when a festival or national holiday recurs on the same day each year in the Gregorian calendar. |
| Attribute | dateVariable | [0..\*] | text | A day which is not fixed in the Gregorian calendar.  Examples: The fourth Thursday in November; new moon day of Kartika (Diwali); Easter Sunday. |
| Complex Attribute | information | [0..\*] | information |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| exceptionalWorkday  *Association* | *Label:* ServiceHours  *Role:* theServiceHours\_nsdy  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* NonStandardWorkingDay  *Role:* partialWorkingDay  *Multiplicity:* 0..\*  Ordered: 0 |  |

### Recommendations

**Class Information Type Super-type: AbstractRXN**

Recommendations for a related area or facility.

Constraint: If **Regulations.textContent** is populated, there cannot be **textualDescription** or **information** attributes directly bound to the **Regulations**.. A similar constraint applies to the information types **Recommendations**, **Restrictions**, and **NauticalInformation**.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Complex Attribute | graphic | [0..\*] | graphic |  |
| Complex Attribute | rxnCode | [0..\*] | rxnCode |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

### Regulations

**Class Information Type Super-type: AbstractRXN**

Regulations for a related area or facility.

Constraint: If **Regulations.textContent** is populated, there cannot be **textualDescription** or **information** attributes directly bound to the **Regulations**.. A similar constraint applies to the information types **Recommendations**, **Restrictions**, and **NauticalInformation**.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Complex Attribute | graphic | [0..\*] | graphic |  |
| Complex Attribute | rxnCode | [0..\*] | rxnCode |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

### Restrictions

**Class Information Type Super-type: AbstractRXN**

Restrictions for a related area or facility.

Constraint: If **Regulations.textContent** is populated, there cannot be **textualDescription** or **information** attributes directly bound to the **Regulations**.. A similar constraint applies to the information types **Recommendations**, **Restrictions**, and **NauticalInformation**.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Complex Attribute | graphic | [0..\*] | graphic |  |
| Complex Attribute | rxnCode | [0..\*] | rxnCode |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

### ServiceHours

**Class Information Type Super-type: InformationType**

The time when a service is available and known exceptions.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | scheduleByDoW | [1..\*] | scheduleByDoW |  |
| Complex Attribute | information | [0..\*] | information |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..\*] | sourceIndication |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| exceptionalWorkday  *Association* | *Label:* ServiceHours  *Role:* theServiceHours\_nsdy  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* NonStandardWorkingDay  *Role:* partialWorkingDay  *Multiplicity:* 0..\*  Ordered: 0 |  |
| locationHours  *Association* | *Label:* RadioServiceArea  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 | Service hours for a physical facility, area, or location-based service |
| authorityHours  *Association* | *Label:* Authority  *Role:* theAuthority\_srvHrs  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..\*  Ordered: 0 | Service hours for an authority |
| locationHours  *Association* | *Label:* RadioStation  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 |  |
| locationHours  *Association* | *Label:* CoastguardStation  *Role:* location\_srvHrs  *Multiplicity:*  Ordered: 0 | *Label:* ServiceHours  *Role:* theServiceHours  *Multiplicity:* 0..1  Ordered: 0 |  |

### InclusionType

**AssociationClass «S100\_AssociationClass» Super-type:**

Association class specifying the relationship between the subset of vessels described by an APPLIC data object and a regulation (restriction, recommendation, or nautical information).

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | membership | [1] | membership | Indicates whether a vessel is included or excluded from the regulation / restriction / recommendation / nautical information. |

#### Inherited Attributes

#### Associations

### PermissionType

**AssociationClass «S100\_AssociationClass» Super-type:**

Association class for associations describing whether the subsets of vessels determined by the ship characteristics specified in APPLIC may (or must, etc.) transit, enter, or use a feature.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfRelationship | [1] | categoryOfRelationship | This attribute expresses the level of insistence for or against an action or activity by a vessel of the subset described by the APPLIC object at one end in relation to the feature at the other end of the association. |

#### Inherited Attributes

#### Associations

## Complex Attributes

### bearingInformation

**Class Complex Attribute Super-type:**

A bearing is the direction one object is from another object.

At least one of the sub-attributes must be present.

*Constraint*: count(sectorBearing) = 0 or 2

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | cardinalDirection | [0..1] | cardinalDirection |  |
| Attribute | distance | [0..1] | Real |  |
| Complex Attribute | information | [0..\*] | information |  |
| Complex Attribute | orientation | [0..1] | orientation |  |
| Attribute | sectorBearing | [0..2] | Real |  |

#### Inherited Attributes

#### Associations

### contactAddress

**Class Complex Attribute Super-type:**

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 | Details of where post can be delivered such as the apartment, name and/or number of a street, building or PO Box. |
| Attribute | cityName | [0..1] | text | The name of a town or city. |
| Attribute | administrativeDivision | [0..1] | text | Administrative division is a generic term for an administrative region within a country at a level below that of the sovereign state. |
| Attribute | country | [0..1] | text | The name of a nation. (Adapted from The American Heritage Dictionaries) |
| Attribute | postalCode | [0..1] | text | Known in various countries as a postcode, or ZIP code, the postal code is a series of letters and/or digits that identifies each postal delivery area. |

#### Inherited Attributes

#### Associations

### facsimileDrumSpeed

**Class Complex Attribute Super-type:**

The drum speed and index of co-operation of a facsimile machine.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
|  | drumSpeed | [1] | Integer | The drum speed in revolutions per minute.  The drum speed should be encoded using three digits for the speed including a leading zero if necessary.  Resolution: 1 |
|  | indexOfCooperation | [1] | Integer | A factor governing the image resolution of radiofax transmissions.  Remarks:   * The Index of Cooperation must be known to decode the transmission. * The Index of Co-operation is generally 576, although 288 with alternate line scanning is sometimes used. |

#### Inherited Attributes

#### Associations

### featureName

**Class Complex Attribute Super-type:**

The complex attribute provides the name of an entity, defines the national language of the name, and provides the option to display the name at various system display settings.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | displayName | [0..1] | Boolean | A statement expressing if a feature name is to be displayed in certain display settings or not.  Indication: Boolean. A True value is an indication that the name is intended to be displayed.  Remarks:  Where it is allowable to encode multiple instances of feature name for a single feature instance, only one feature name instance can indicate that the name is to be displayed (**display name** set to *True*). |
| Attribute | language | [0..1] | ISO639-3 | The language is encoded by a character code following ISO 639-3 |
| Attribute | name | [1] | text | The individual name of a feature. |

#### Inherited Attributes

#### Associations

### fixedDateRange

**Class Complex Attribute Super-type:**

Describes a single fixed period, as the date range between its sub-attributes.

Remarks: Sub-attributes date end and date start must have the calendar year encoded using 4 digits for the calendar year (CCYY). Month (MM) and day (DD) are optional.

(This definition merges the planned S-100 temporal model with the current S-101 DCEG definition of fixed date range.)

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateStart | [0..1] | S100\_TruncatedDate | The start date or time of the interval. |
| Attribute | dateEnd | [0..1] | S100\_TruncatedDate | The end date or time of the interval. |

#### Inherited Attributes

#### Associations

### frequencyPair

**Class Complex Attribute Super-type:**

A pair of frequencies for transmitting and receiving radio signals. The shore station transmits and receives on the frequencies indicated

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | frequencyShoreStationReceives | [0..1] | Integer | The shore station receiver frequency expressed in kHz to one decimal place. Units: kHz, Resolution: 0.1, Format: XXXXXX  Examples:  4379.1 kHz becomes 043791  13162.8 kHz becomes 131628 |
| Attribute | frequencyShoreStationTransmits | [0..1] | Integer | The shore station transmitter frequency expressed in kHz to one decimal place. Units: kHZ, Resolution: 0.1, Format: XXXXXX  Examples:  4379.1 kHz becomes 043791  13162.8 kHz becomes 131628 |

#### Inherited Attributes

#### Associations

### graphic

**Class Complex Attribute Super-type:**

Pictorial information such as a photograph, sketch, or other graphic, optionally accompanied by descriptive information about the graphic and the location relative to its subject from which it was made.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | pictorialRepresentation | [1..\*] | text |  |
| Attribute | pictureCaption | [0..1] | text | Short description of the purpose of the image. |
| Attribute | sourceDate | [0..1] | Date |  |
| Attribute | pictureInformation | [0..1] | text | A set of information to provide credits to picture creator, copyright owner etc. |
| Complex Attribute | bearingInformation | [0..1] | bearingInformation |  |

#### Inherited Attributes

#### Associations

### information

**Class Complex Attribute Super-type:**

Provides textual information that cannot be provided using other allowable attributes for the feature, in a defined language. The information may be provided as a string in sub-attribute **text,** or by encoding the file name of a single external text file that contains the text in sub-attribute **file reference**.

Remarks:

* The sub-attribute **text** should be used, for example, to hold the information that is shown on paper charts by cautionary and explanatory notes. No formatting of text is possible within the sub-attribute **text**. If formatted text is required then an associated text file referenced by the sub-attribute **file reference** must be used.
* The sub-attribute **file reference** is generally used for long text strings or those that require formatting, however there is no restriction on the type of text (except for lexical level) that can be held in files referenced by sub-attribute **file reference**.

*Constraint*: count(text + fileReference) > 0

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | fileLocator | [0..1] | text | The string encodes the location of a fragment of text or other information in a support file.  Remarks:   * Application schemas must describe how the associated file is identified. The associated file will commonly be named in a **file reference** co-attribute of the same complex attribute. * Each DCEG must specify requirements for the format of the associated file and the semantics of **file locator**. For example, the value of **file locator** may be an HTML ID in an HTML file, line number in a text file) or a bookmark in a PDF file. |
| Attribute | fileReference | [0..1] | text | The string encodes the file name of a single external text file that contains the text.  Remarks:  The attribute **file reference** is generally used for long text strings or those that require formatting, however there is no restriction on the type of text (except for lexical level) that can be held in files referenced by sub-attribute **file reference**. |
| Attribute | headline | [0..1] | text | Words set at the head of a passage or page to introduce or categorize |
| Attribute | language | [0..1] | ISO639-3 | ISO 639-3 value |
| Attribute | text | [0..1] | text | A non-formatted digital text string.  Remarks:  The attributeshould be used, for example, to hold the information that is shown on paper charts by short cautionary and explanatory notes. Therefore text populated in text must not exceed 300 characters.  Text may be in English or in a national language defined by the attribute **language**.  No formatting of text is possible within the sub-attribute **text**. If formatted text, or text strings exceeding 300 characters, is required, then the attribute **file reference** must be used. |

#### Inherited Attributes

#### Associations

### onlineResource

**Class Complex Attribute Super-type:**

Information about online sources from which a resource or data can be obtained (ISO 19115, adapted).

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | linkage | [1] | URL | location (address) for on-line access using a URL/URI address or similar addressing scheme. (Adapted from ISO 19115:2014.) |
| Attribute | protocol | [0..1] | text | connection protocol to be used. Example: ftp, http get KVP, http POST, etc. (ISO 19115) |
| Attribute | applicationProfile | [0..1] | text | name of an application profile that can be used with the online resource (ISO 19115) |
| Attribute | nameOfResource | [0..1] | text | name of the online resource (ISO 19115, adapted) |
| Attribute | onlineDescription | [0..1] | text | detailed text description of what the online resource is/does (ISO 19115) |
| Attribute | onlineFunction | [0..1] | onlineFunction | code for function performed by the online resource (ISO 19115) |
| Attribute | protocolRequest | [0..1] | text | Request used to access the resource. Structure and content depend on the protocol and standard used by the online resource, such as Web Feature Service standard. (ISO 19115, adapted) |

#### Inherited Attributes

#### Associations

### orientation

**Class Complex Attribute Super-type:**

The angular distance measured from true north to the major axis of the feature.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | orientationUncertainty | [0..1] | Real |  |
| Attribute | orientationValue | [1] | Real |  |

#### Inherited Attributes

#### Associations

### periodicDateRange

**Class Complex Attribute Super-type:**

This complex attribute describes the active period for a seasonal feature or information type.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dateStart | [1] | S100\_TruncatedDate | The start date or time of the interval. |
| Attribute | dateEnd | [1] | S100\_TruncatedDate | The end date or time of the interval. |

#### Inherited Attributes

#### Associations

### radiocommunications

**Class Complex Attribute Super-type:**

Detailed radiocommunications description with channels, frequencies, preferences and time schedules

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfCommPref | [0..1] | categoryOfCommPref |  |
| Attribute | categoryOfRadioMethods | [0..\*] | categoryOfRadioMethods |  |
| Attribute | categoryOfMaritimeBroadcast | [0..\*] | categoryOfMaritimeBroadcast |  |
| Attribute | communicationChannel | [0..\*] | text |  |
| Attribute | contactInstructions | [0..1] | text | supplemental instructions on how or when to contact the individual, organisation, or service |
| Complex Attribute | facsimileDrumSpeed | [0..1] | facsimileDrumSpeed |  |
| Complex Attribute | frequencyPair | [0..\*] | frequencyPair |  |
| Attribute | selectiveCallNumber | [0..1] | Integer | When stations of the maritime mobile service (direct printing telegraphy) use selective calling devices, their Selective Call numbers (SELCAL) are formed of four digits (coast stations). (Adapted: Radio Regulations (ITU)) |
| Attribute | signalFrequency | [0..1] | Integer |  |
| Complex Attribute | timeOfObservation | [0..1] | timeOfObservation |  |
| Complex Attribute | timesOfTransmission | [0..1] | timesOfTransmission |  |
| Attribute | transmissionContent | [0..1] | text | Content of transmission.  Remarks: Not to be used if CATMAB is populated |
| Complex Attribute | tmIntervalsByDoW | [0..\*] | tmIntervalsByDoW |  |
| Attribute | transmissionRegularity | [0..\*] | transmissionRegularity | Classification of regularity or conditions for transmission |

#### Inherited Attributes

#### Associations

### radioStationCommunicationDescription

**Class Complex Attribute Super-type:**

Description of the type and content of a communication or broadcast from a radio station.

Remark: This complex attribute is not intended for detailed descriptions of a station's radio services. For detailed descriptions of radio service, use the attributes of the associated RadioServiceArea feature.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfMaritimeBroadcast | [0..\*] | categoryOfMaritimeBroadcast |  |
| Attribute | communicationChannel | [0..\*] | text | A channel number assigned to a specific radio frequency, frequencies or frequency band.  Remarks: The attribute “communication channel” encodes the various VHF-Channels used for communication. |
| Attribute | signalFrequency | [0..1] | Integer | The frequency of a signal. |
| Attribute | transmissionContent | [0..1] | text | Content of transmission.  Remark: Other than MSI.  Not to be used if CATMAB is populated. |

#### Inherited Attributes

#### Associations

### rxnCode

**Class Complex Attribute Super-type:**

A summary of the impact of the most common types of regulation, restriction, recommendation and nautical information on a vessel.

**Remark**: This attribute converts the subject, topic, and effects of regulations, etc., from plain text or natural language into a set of categories.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfRxN | [0..1] | categoryOfRxN |  |
| Attribute | actionOrActivity | [0..1] | actionOrActivity |  |
| Attribute | headline | [0..1] | text | Words set at the head of a passage or page to introduce or categorize |

#### Inherited Attributes

#### Associations

### scheduleByDoW

**Class Complex Attribute Super-type:**

Describes the nature and timings of a daily schedule by days of the week.

Alternative: 'Describes the nature and timings of a daily schedule'

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfSchedule | [0..1] | categoryOfSchedule | Describes the type of schedule, e.g., opening, closure, etc. |
| Complex Attribute | tmIntervalsByDoW | [1..\*] | tmIntervalsByDoW |  |

#### Inherited Attributes

#### Associations

### sourceIndication

**Class Complex Attribute Super-type:**

Proposed definition: Information about the source document, publication, or reference from which object data or textual material included or referenced in a dataset are derived. (S-57 SORIND, adapted.)

Remarks:

* sourceIndication is intended for encoding meta-information that helps the end-user evaluate the reliability or importance of object data or textual material. Its use should be limited to situations where end users may need to evaluate reliability or importance themselves.
* The content of the featureName sub-attribute, if populated, must be the name of the authority or organization which published or distributed the source document.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfAuthority | [0..1] | categoryOfAuthority |  |
| Attribute | country | [0..1] | text |  |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Attribute | reportedDate | [0..1] | S100\_TruncatedDate |  |
| Attribute | source | [0..1] | text | The publication, document, or reference work from which information comes or is acquired. |
| Attribute | sourceType | [0..1] | sourceType | Type of source |

#### Inherited Attributes

#### Associations

### telecommunications

**Class Complex Attribute Super-type:**

Proposed definition: A means or channel of communication at a distance by electrical or electromagnetic means such as telegraphy, telephony, or broadcasting. (OED, adapted)

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | contactInstructions | [0..1] | text | supplemental instructions on how or when to contact the individual, organisation, or service |
| Attribute | telcomCarrier | [0..1] | text | The name of provider or type of carrier for a telecommunications service |
| Attribute | telecommunicationIdentifier | [1] | text | Identifier used for contact by means of a telecommunications service, such as a telephone number |
| Attribute | telecommunicationService | [0..\*] | telecommunicationService | Type of telecommunications service |
| Attribute | categoryOfCommPref | [0..1] | categoryOfCommPref |  |
| Complex Attribute | scheduleByDoW | [0..1] | scheduleByDoW |  |

#### Inherited Attributes

#### Associations

### textContent

**Class Complex Attribute Super-type:**

Proposed definition: Textual material, or a pointer to a resource providing textual material. May be accompanied by basic information about its source and relationship to the source.

Remarks:

* **textContent** is intended to allow text passages from other publications to be included in, or referenced by, instances of feature or information types.
* Exactly one of sub-attributes **onlineResource** or **information** must be completed in one instance of **textContent**.
* Product specifications may restrict the use or content of **onlineResource** for security. For example, a product specification may forbid populating **onlineResource**.
* Product specification authors must consider whether applications using the data product may be prevented from accessing off-system resources by security policies.

*Constraint*: count(information + onlineresource) > 0

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfText | [0..1] | categoryOfText |  |
| Complex Attribute | information | [0..\*] | information |  |
| Complex Attribute | onlineResource | [0..1] | onlineResource |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |

#### Inherited Attributes

#### Associations

### tmIntervalsByDoW

**Class Complex Attribute Super-type:**

Time intervals by days of the week.

Remarks:

* The sub-attribute dayOfWeekIsRange indicates whether an instance of this complex attribute encodes a range of days or discrete days. The days or day-range(s) are encoded in sub-attribute dayOfWeek. An indeterminate range may be indicated with a null value at the appropriate position.
* Multiple ranges or multiple days are allowed in one instance of this complex attribute, but mixing range with discrete days(s) is not allowed (encode another instance of this attribute instead).
* Product specifications may need to allow repetition of this complex attribute in order to allow encoding of schedules which vary for different days of the week.
* Ranges may 'wrap'; for example, the range 7-2 (meaning Sunday through Tuesday, inclusive) is permitted.
* To encode multiple intervals during the day, repeat TIMSTW and TIMENW as necessary.

Constraints: Duplicates or overlaps are not permitted.

Examples:

1. To encode “Monday through Friday” use the sequence: dayOfWeek=1, dayOfWeek=5 and set dayOfWeekIsRange=TRUE.
2. To encode the days Monday, Wednesday, Friday, use the sequence dayOfWeek=1, dayOfWeek=3, dayOfWeek=5 and set dayOfWeekIsRange=FALSE.
3. The sequence dayOfWeek=1, dayOfWeek=3, dayOfWeek=5 to indicate Mon-Wed and Thursday is not allowed. Encode the Mon-Wed and Thursday schedules in different instances of this complex attribute.
4. To encode times that are the same through the US/European work week (Monday through Friday) but different on weekends (Saturday/Sunday), encode two instances of the complex attribute tmIntervalsByDoW bound to the same object.
5. Office hours from 0800-1200 and 1300-1700 from Monday through Friday are encoded using one instance of tmIntervalsByDoW with TIMSTW=0800, TIMENW = 1200, and TIMSTW=1300, TIMENW=1700 (and dayOfWeek and DayOfWeekIsRange as in example 1 above).

Old remarks:

Remarks:

The sub-attribute *dayOfWeekIsRanges* indicates whether an instance of this attributeencodes a range of days or discrete days. The days or day-range(s) are encoded in sub-attribute *dayOfWeek*. Multiple ranges are allowed but mixing range with discrete days(s) is not allowed (encode another instance of this attribute instead).

An indeterminate range may be indicated with a null value at the appropriate position in the sequence.

Examples:

* To code the range “Monday through Friday” use the sequence: *dayOfWeek*=1, *dayOfWeek*=5 and set *dayOfWeekIsRanges*=TRUE.
* To encode the days Monday, Wednesday, Friday, use the sequence *dayOfWeek*=1, *dayOfWeek*=3, *dayOfWeek*=5 and set *dayOfWeekIsRanges*=FALSE.
* The sequence *dayOfWeek*=1, *dayOfWeek*=3, *dayOfWeek*=5 to indicate Mon-Wed and Thursday is not allowed. Encode the Mon-Wed and Thursday schedules in different instances of this complex attribute.

Product specifications may need to allow this attributeto be repeated in order to allow encoding of schedules which vary for different days of the week.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | dayOfWeek | [0..7] | dayOfWeek | Encodes either range(s) of days or discrete days. |
| Attribute | dayOfWeekIsRange | [0..1] | boolean | Indicates whether the values in dayOfWeek indicate a range of days (true) or discrete days (false).  Mandatory if co-attribute dayOfWeek has cardinality > 1.. |
| Attribute | timeReference | [1] | timeReference | Indicates whether the time co-attributes are encoded in UTC or local time (LT). |
| Attribute | timeOfDayStart | [0..\*] | Time | Starting time of day, possibly for a period within the day.  Distinction: Time start (TIMSTA) (S-101) which has a format YYYYMMDD**T**hhmmss **(mandatory)** in the baseline S-101 DCEG as of October 2015. |
| Attribute | timeOfDayEnd | [0..\*] | Time | Ending time of day, possibly for a period within the day.  Distinction: Time end (TIMEND) (S-101) which has a format YYYYMMDD**T**hhmmss **(mandatory)** in the baseline S-101 DCEG as of October 2015. |

#### Inherited Attributes

#### Associations

### timeOfObservation

**Class Complex Attribute Super-type:**

The time in the day when a weather or ice observation is made, expressed in UTC or local time. The time of observation normally amplifies the time of transmission of radio-facsimile weather maps or ice charts.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | observationTime | [1] | Time | The time on each day when observations are made |
| Attribute | timeReference | [1] | timeReference |  |

#### Inherited Attributes

#### Associations

### timesOfTransmission

**Class Complex Attribute Super-type:**

One or more times in the day when the radio station starts a routine transmission, normally expressed in UTC or local time.

*Constraint*: TIMREF is mandatory if TRMTIM is populated -- todo OCL

*Constraint*: At least one of TRMTIM, MNTALL, MNTEVN, MNTODD must be populated -- to do: OCL

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | minutePastEvenHours | [0..1] | Integer | The minute past even hours when a routine transmission starts.  Unit: Minute of time  Resolution: 1  Format: XX  Example: 25 for 25 minutes past even hours. |
| Attribute | minutePastEveryHour | [0..1] | Integer | The minute past every hour when a routine transmission starts |
| Attribute | minutePastOddHours | [0..1] | Integer | The minute past odd hours when a routine transmission starts.  Unit: Minute of time  Resolution: 1  Format: XX  Example: 25 for 25 minutes past odd hours. |
| Attribute | timeReference | [0..1] | timeReference | -- todo: OCL |
| Attribute | transmisssionTime | [0..\*] | Time | The time in the day when scheduled transmissions start. |

#### Inherited Attributes

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| *Aggregation* | *Label:* timesOfTransmission  *Role:*  *Multiplicity:* 0..1  Ordered: 0 | *Label:* RadioServiceArea  *Role:*  *Multiplicity:*  Ordered: 0 |  |

### vesselsMeasurements

**Class Complex Attribute Super-type:**

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | comparisonOperator | [1] | comparisonOperator |  |
| Attribute | vesselsCharacteristics | [1] | vesselsCharacteristics |  |
| Attribute | vesselsCharacteristicsValue | [1] | real |  |
| Attribute | vesselsCharacteristicsUnit | [1] | vesselsCharacteristicsUnit |  |

#### Inherited Attributes

#### Associations

## Codelists

### actionOrActivity

S-100 Codelist

*Definition:* The action or activity of a vessel

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | navigating with a pilot | 1 | Carrying a qualified pilot as part of the vessel navigation team. |
| Literal | entering port | 2 | navigating a vessel into a port |
| Literal | leaving port | 3 | Navigating a vessel out of a port. |
| Literal | berthing | 4 | Attaching a vessel to a wharf or jetty. |
| Literal | slipping | 5 | Detaching a vessel from a wharf or jetty. |
| Literal | anchoring | 6 | Attaching a vessel to the seabed by means of an anchor and cable. |
| Literal | weighing anchor | 7 | Detaching a vessel from the seabed by recovering an anchor and cable. |
| Literal | transiting | 8 | Navigating a vessel along a route or through a narrow gap, such as under a bridge or through a lock. |
| Literal | overtaking | 9 | Navigating a vessel past another traveling broadly in the same direction. |
| Literal | reporting | 10 | Providing details such as the name, location or intentions of a vessel |
| Literal | working cargo | 11 | Loading or unloading cargo |
| Literal | landing | 12 | Placing crew or passengers on shore. |
| Literal | diving | 13 | Placing a swimmer with an air supply below the sea surface. |
| Literal | fishing | 14 | Hunting or catching fish. |
| Literal | discharging overboard | 15 | Releasing anything into the sea; often ballast water; or spoil from dredging elsewhere. |
| Literal | passing | 16 | Navigating a vessel past another traveling broadly in the opposite direction. |

### categoryOfVessel

S-100 Codelist

*Definition:* Classification of vessels by function or use.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | general cargo vessel | 1 | a vessel designed to carry general cargo |
| Literal | container carrier | 2 | a vessel designed to carry ISO containers |
| Literal | tanker | 3 | a vessel designed to carry bulk liquid or gas, including LPG and LNG |
| Literal | bulk carrier | 4 | a vessel designed to carry bulk solid material |
| Literal | passenger vessel | 5 | a vessel designed to carry passengers; often a cruise ship |
| Literal | roll-on roll-off | 6 | a vessel designed to allow road vehicles to be driven on and off; often a ferry |
| Literal | refrigerated cargo vessel | 7 | a vessel designed to carry refrigerated cargo |
| Literal | fishing vessel | 8 | a vessel designed to catch or hunt fish |
| Literal | service | 9 | a vessel which provides a service such as a tug, anchor handler, survey or supply vessel |
| Literal | warship | 10 | a vessel designed for the conduct of military operations |
| Literal | towed or pushed composite unit | 11 | either a tug and tow, or any combination of a tug providing propulsion to barges or vessels secured ahead or alongside |
| Literal | tug and tow | 12 | a combination of tug(s) and non-powered tow(s) |
| Literal | light recreational | 13 | A pleasure boat or watercraft, or an excursion vessel used for short cruises such as whale watching |
| Literal | semi-submersible offshore installation | 14 | An installation which is designed to float at all times and which is normally anchored in position when deployed in the offshore gas and oil industry. |
| Literal | jackup exploration or project installation | 15 | An exploration or project installation with legs which can be raised and lowered. The legs are raised when the installation is repositioned. When stationary the legs are lowered to the sea floor and the working platform is raised clear of the sea surface |
| Literal | livestock carrier | 16 | A vessel designed to carry large quantities of live animals. |
| Literal | sport fishing | 17 | A vessel used in fishing for pleasure or competition. |

### categoryOfRxN

S-100 Codelist

*Definition:* The principal subject matter of regulations, restrictions, recommendations or nautical information

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | navigation | 1 | Pertaining to navigation |
| Literal | communication | 2 | Pertaining to communications |
| Literal | environmental protection | 3 | Pertaining to environmental protection |
| Literal | wildlife protection | 4 | Pertaining to wildlife protection |
| Literal | security | 5 | Pertaining to security |
| Literal | customs | 6 | Pertaining to customs |
| Literal | cargo operation | 7 | Pertaining to cargo operations |
| Literal | refuge | 8 | Pertaining to a place of safety or refuge |
| Literal | natural resources or exploitation | 9 | Pertaining to natural resources or exploitation |
| Literal | port | 10 | Pertaining to a port |
| Literal | finance | 11 | Pertaining to finance |
| Literal | agriculture | 12 | Pertaining to agriculture |

### categoryOfSchedule

S-100 Codelist

*Definition:* Describes the type of schedule, e.g., opening, closure, etc.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | normal operation | 1 | The service, office, is open, fully manned, and operating normally, or the area is accessible as usual. |
| Literal | closure | 2 | The service, office, or area is closed. |
| Literal | unmanned operation | 3 | The service is available but not manned. |

### onlineFunction

S-100 Codelist

*Definition:* code for function performed by the online resource (ISO 19115)

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | download | 1 | online instructions for transferring data from one storage device or system to another. (ISO 19115:2014) |
| Literal | information | 2 | online information about the resource (ISO 19115:2014) |
| Literal | offlineAccess | 3 | online instructions for requesting the resource from the provider (ISO 19115:2014) |
| Literal | order | 4 | online order process for obtaining the resource (ISO 19115:2014). |
| Literal | search | 5 | online search interface for seeking out information about the resource (ISO 19115:2014). |
| Literal | completeMetadata | 6 | complete metadata provided (ISO 19115:2014). |
| Literal | browseGraphic | 7 | browse graphic provided (ISO 19115:2014). |
| Literal | upload | 8 | online resource upload capability provided (ISO 19115:2014). |
| Literal | emailService | 9 | online email service provided (ISO 19115:2014) |
| Literal | browsing | 10 | online browsing provided (ISO 19115:2014) |
| Literal | fileAccess | 11 | online file access provided (ISO 19115:2014). |

### telecommunicationService

S-100 Codelist

*Definition:* Classification of methods of communication over a distance by electrical, electronic, or electromagnetic means.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | voice | 1 | The transfer or exchange of information by using sounds that are being made by mouth and throat when speaking |
| Literal | facsimile | 2 | a system of transmitting and reproducing graphic matter (as printing or still pictures) by means of signals sent over telephone lines |
| Literal | sms | 3 | Short Message Service, a form of text messaging communication on phones and mobile phones |
| Literal | data | 4 | facts or information used usually to calculate, analyze, or plan something |
| Literal | streamedData | 5 | Streamed data is data that that is constantly received by and presented to an end-user while being delivered by a provider. |
| Literal | telex | 6 | a system of communication in which messages are sent over long distances by using a telephone system and are printed by using a special machine (called a teletypewriter) |
| Literal | telegraph | 7 | an apparatus, system, or process for communication at a distance by electric transmission over wire |
| Literal | email | 8 | Messages and other data exchanged between individuals using computers in a network. |

## Enumerations

### cardinalDirection

Enumeration

*Definition:* Principal and intermediate compass points.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | N | 1 | North |
| Literal | NNE | 2 | Northnortheast |
| Literal | NE | 3 | Northeast |
| Literal | ENE | 4 | Eastnortheast |
| Literal | E | 5 | East |
| Literal | ESE | 6 | Eastsoutheast |
| Literal | SE | 7 | Southeast |
| Literal | SSE | 8 | Southsoutheast |
| Literal | S | 9 | South |
| Literal | SSW | 10 | Southsouthwest |
| Literal | SW | 11 | Southwest |
| Literal | WSW | 12 | Westsouthwest |
| Literal | W | 13 | West |
| Literal | WNW | 14 | Westnorthwest |
| Literal | NW | 15 | Northwest |
| Literal | NNW | 16 | Northnorthwest |

### categoryOfAuthority

Enumeration

*Definition:* The type of person, government agency or organisation granted powers of managing or controlling access to and/or activity in an area.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | customs | 1 | The agency or establishment for collecting duties, tolls. (Merriam-Websters online Dictionary 23rd February 2006, amended). |
| Literal | border control | 2 | The administration to prevent or detect and prosecute violations of rules and regulations at international boundaries (adapted from Merriam-Websters online Dictionary 23rd February 2006). |
| Literal | police | 3 | The department of government, or civil force, charged with maintaining public order. (Adapted from OED) |
| Literal | port | 4 | Person or corporation, owners of, or entrusted with or invested with the power of managing a port. May be called a Harbour Board, Port Trust, Port Commission, Harbour Commission, Marine Department (NP 100 8th Edition 14 Oct 2004) |
| Literal | immigration | 5 | The authority controlling people entering a country. |
| Literal | health | 6 | The authority with responsibility for checking the validity of the health declaration of a vessel and for declaring free pratique. |
| Literal | coast guard | 7 | Organisation keeping watch on shipping and coastal waters according to governmental law; normally the authority with responsibility for search and rescue. |
| Literal | agricultural | 8 | The authority with responsibility for preventing infection of the agriculture of a country and for the protection of the agricultural interests of a country. |
| Literal | military | 9 | A military authority which provides control of access to or approval for transit through designated areas or airspace. |
| Literal | private company | 10 | A private or publicly owned company or commercial enterprise which exercises control of facilities, for example a calibration area. |
| Literal | maritime police | 11 | A governmental or military force with jurisdiction in territorial waters. Examples could include Gendarmerie Maritime, Carabinierie, and Guardia Civil. |
| Literal | environmental | 12 | An authority with responsibility for the protection of the environment. |
| Literal | fishery | 13 | An authority with responsibility for the control of fisheries. |
| Literal | finance | 14 | an authority with responsibility for the control and movement of money. |
| Literal | maritime | 15 | A national or regional authority charged with administration of maritime affairs. |

### categoryOfBroadcastCommunication

Enumeration

*Definition:* Classification of broadcast or communications based on public availability and commercial/non-commercial nature.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | commercial | 1 | A service operated with the intention of earning money |
| Literal | non-commercial | 2 | A service without any financial interest |
| Literal | public | 3 | A service available for the general community |
| Literal | non-public | 4 | A service available for limited and pre-defined customers |

### categoryOfCargo

Enumeration

*Definition:* Classification of the different types of cargo that a ship may be carrying

Remarks:

If item 7 is used, the nature of dangerous or hazardous cargoes can be amplified with category of dangerous or hazardous cargo.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | bulk | 1 | Normally dry cargo which is transported to and from the vessel on conveyors or grabs |
| Literal | container | 2 | One of a number of standard sized cargo carrying units, secured using standard corner attachments and bars |
| Literal | general | 3 | Break bulk cargo normally loaded by crane |
| Literal | liquid | 4 | Any cargo loaded by pipeline |
| Literal | passenger | 5 | A fee paying traveller |
| Literal | livestock | 6 | Live animals carried in bulk |
| Literal | dangerous or hazardous | 7 | Dangerous or hazardous cargo as described by the IMO International Maritime Dangerous Goods code |

### categoryOfCommPref

Enumeration

*Definition:* Classification of frequencies, VHF channels, telephone numbers, or other means of communication based on preference.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | preferred calling | 1 | the first choice channel or frequency to be used when calling a radio station |
| Literal | alternate calling | 2 | a channel or frequency to be used for calling a radio station when the preferred channel or frequency is busy or is suffering from interference |
| Literal | preferred working | 3 | the first choice channel or frequency to be used when working with a radio station |
| Literal | alternate working | 4 | a channel or frequency to be used for working with a radio station when the preferred working channel or frequency is busy or is suffering from interference |

### categoryOfDangerousOrHazardousCargo

Enumeration

*Definition:* Classification of dangerous goods or hazardous materials based on the International Maritime Dangerous Goods Code (IMDG Code).

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | Class 1: Division 1.1 | 1 | Explosives, Division 1: substances and articles which have a mass explosion hazard |
| Literal | Class 1: Division 1.2 | 2 | Explosives, Division 2: substances and articles which have a projection hazard but not a mass explosion hazard |
| Literal | Class 1: Division 1.3 | 3 | Explosives, Division 3: substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard |
| Literal | Class 1: Division 1.4 | 4 | Explosives, Division 4: substances and articles which present no significant hazard |
| Literal | Class 1: Division 1.5 | 5 | Explosives, Division 5: very insensitive substances which have a mass explosion hazard |
| Literal | Class 1: Division 1.6 | 6 | Explosives, Division 6: extremely insensitive articles which do not have a mass explosion hazard |
| Literal | Class 2.1 | 7 | Gases, flammable gases |
| Literal | Class 2.2 | 8 | Gases, non-flammable, non-toxic gases |
| Literal | Class 2.3 | 9 | Gases, toxic gases |
| Literal | Class 3 | 10 | flammable liquids |
| Literal | Class 4.1 | 11 | flammable solids, self-reactive substances and desensitized explosives |
| Literal | Class 4.2 | 12 | substances liable to spontaneous combustion |
| Literal | Class 4.3 | 13 | substances which, in contact with water, emit flammable gases |
| Literal | Class 5.1 | 14 | oxidizing substances |
| Literal | Class 5.2 | 15 | organic peroxides |
| Literal | Class 6.1 | 16 | toxic substances |
| Literal | Class 6.2 | 17 | infectious substances |
| Literal | Class 7 | 18 | Radioactive material |
| Literal | Class 8 | 19 | Corrosive substances |
| Literal | Class 9 | 20 | Miscellaneous dangerous substances and articles |
| Literal | Harmful Substances in packaged form | 21 | Harmful substances are those substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code). Packaged form is defined as the forms of containment specified for harmful substances in the IMDG Code. (MARPOL (73/78) Annex III) |

### categoryOfFrcstAndWarningArea

Enumeration

*Definition:* Classification of weather forecast and weather warning areas based on source of warnings and forecasts.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | World Meteorological Organization (WMO) | 1 | The forecast and warning area defined by WMO |
| Literal | National high seas | 2 | The forecast and warning area defined by national authorities covering High Seas |
| Literal | National offshore | 3 | The forecast and warning area defined by national authorities covering offshore waters. |
| Literal | National coastal | 4 | The forecast and warning area defined by national authorities covering coastal waters. |
| Literal | National inshore | 5 | The forecast and warning area defined by national authorities covering inshore waters. |
| Literal | National local | 6 | The forecast and warning area defined by national authorities covering local waters. |
| Literal | Ice | 7 | The ice forecast area defined by international or national authorities. |

### categoryOfGMDSSArea

Enumeration

*Definition:* Classification of GMDSS areas based on availability of GMDSS services and GMDSS equipment requirements.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | Area A1 | 1 | Within range of VHF coast stations with continuous DSC alerting available (about 20 – 30 miles) |
| Literal | Area A2 | 2 | Beyond area A1, but within range of MF coastal stations with continuous DSC alerting available (about l00 miles) |
| Literal | Area A3 | 3 | Beyond the first two areas, but within coverage of geostationary maritime communication satellites (in practice this means Inmarsat). This covers the area between roughly 70 deg N and 70 deg S. |
| Literal | Area A4 | 4 | The remaining sea areas. The most important of these is the sea around the North Pole (the area around the South Pole is mostly land). Geostationary satellites, which are positioned above the equator, cannot reach this far. |

### categoryOfLandmark

Enumeration

*Definition:* Classification of prominent cultural and natural features in the landscape.

S-123 Note: Only landmarks of relevance to radiocommunications are encoded in S-123 datasets, e.g., radio masts used for marine broadcasts if their location needs to be shown

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | dish aerial | 4 | A parabolic aerial for the receipt and transmission of high frequency radio signals. (IHO Dictionary – S-32). |
| Literal | mast | 7 | A relatively tall structure usually held vertical by guy lines. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.45, November 2000). |
| Literal | tower | 17 | A relatively tall, narrow structure that may either stand alone or may form part of another structure. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010). |

### categoryOfMaritimeBroadcast

Enumeration

*Definition:* Classification of maritime broadcast based on the nature of information conveyed.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | navigational warning | 1 | message containing urgent information relevant to safe navigation broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended |
| Literal | meteorological warning | 2 | warning of adverse weather conditions |
| Literal | ice report | 3 | report of the ice situation and restrictions to shipping |
| Literal | SAR information | 4 | broadcast message with information about an ongoing SAR operation |
| Literal | pirate attack warning | 5 | warning of possible attack by pirates |
| Literal | meteorological forecast | 6 | broadcast message containing meteorological forecast |
| Literal | pilot service message | 7 | broadcast message about pilot service |
| Literal | AIS information | 8 | broadcast message about AIS information |
| Literal | LORAN message | 9 | broadcast message about the LORAN service |
| Literal | SATNAV message | 10 | broadcast message about Satellite Navigation service |
| Literal | gale warning | 11 | warning of winds of Beaufort force 8 or 9 |
| Literal | storm warning | 12 | warning of winds of Beaufort force 10 or over |
| Literal | tropical revolving storm warning | 13 | warning of hurricanes in the North Atlantic and eastern North Pacific, typhoons in the Western Pacific, cyclones in the Indian Ocean and cyclones of similar nature in other regions |
| Literal | NAVAREA warning | 14 | navigational warning or in-force bulletin promulgated as part of a numbered series by a NAVAREA coordinator (Maritime Safety Information Manual 2009) |
| Literal | coastal warning | 15 | navigational warning promulgated as part of a numbered series by a National coordinator (Maritime Safety Information Manual 2009) |
| Literal | local warning | 16 | warning which covers inshore waters, often within the limits of jurisdiction of a harbour or port authority (Maritime Safety Information Manual 2009) |
| Literal | low water level warning/negative tidal surge | 17 | warning of actual or expected low water level |
| Literal | icing warning | 18 | warning of accretion of ice on ships |
| Literal | tsunami broadcast | 19 | broadcasts about tsunamis, including watches, advisories, and other types of messages relating to tsunamis or potential tsunamis |

### categoryOfRadioMethods

Enumeration

*Definition:* Categories of radiocommunications based on frequency band and radio traffic method.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | Low Frequency (LF) voice traffic | 1 | Frequency in a frequency range between 30 and 300 kHz used for voice traffic |
| Literal | Medium Frequency (MF) voice traffic | 2 | Frequency in a frequency range between 300 and 3 000kHz used for voice traffic |
| Literal | High Frequency (HF) voice traffic | 3 | Frequency in a frequency range between 3 and 30 MHz used for voice traffic |
| Literal | Very High Frequency (VHF) voice traffic | 4 | Frequency in a frequency range between 30 and 300 MHz used for voice traffic |
| Literal | High Frequency Narrow Band Direct Printing | 5 | High Frequency Narrow Band Direct Printing |
| Literal | NAVTEX | 6 | Narrow-band direct-printing telegraphy system for transmission of maritime safety information. |
| Literal | SafetyNET | 7 | SafetyNET is an international automatic direct-printing satellite-based service for the promulgation of navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages - maritime safety information (MSI) - to ships. |
| Literal | NBDP Telegraphy | 8 | Narrow Band Direct Printing Telegraphy. A communications system consisting of teletypewriters connected to a telephonic network to send and receive wireless signals. |
| Literal | facsimile | 9 | A method or device for transmitting documents, drawings, photographs, or the like, by means of radio or telephone for exact reproduction elsewhere. |
| Literal | NAVIP | 10 | A Russian system transmitting navigational information, send by radio and containing information relevant to coastal waters of foreign countries and high seas. |
| Literal | Low Frequency (LF) digital traffic | 11 | Frequency in a frequency range between 30 and 300 kHz used for digital traffic |
| Literal | Medium Frequency (MF) digital traffic | 12 | Frequency in a frequency range between 300 and 3000kHz used for digital traffic |
| Literal | High Frequency (HF) digital traffic | 13 | Frequency in a frequency range between 3 and 30 MHz used for digital traffic |
| Literal | Very High Frequency (VHF) digital traffic | 14 | Frequency in a frequency range between 30 and 300 MHz used for digital traffic |
| Literal | Low Frequency (LF) telegraph traffic | 15 | Frequency in a frequency range between 30 and 300 kHz used for telegraph traffic |
| Literal | Medium Frequency (MF) telegraph traffic | 16 | Frequency in a frequency range between 300 and 3 000kHz used for telegraph traffic |
| Literal | High Frequency (HF) telegraph traffic | 17 | Frequency in a frequency range between 3 and 30 MHz used for telegraph traffic |
| Literal | Medium Frequency (MF) Digital Selective Call traffic | 18 | Frequency in a frequency range between 300 and 3000kHz used for Digital Selective Call traffic |
| Literal | High Frequency (HF) Digital Selective Call traffic | 19 | Frequency in a frequency range between 3 and 30 MHz used for Digital Selective Call traffic |
| Literal | Very High Frequency (VHF) Digital Selective Call traffic | 20 | Frequency in a frequency range between 30 and 300 MHz used for Digital Selective Call traffic |

### categoryOfRadioStation

Enumeration

*Definition:* Classification of radio services offered by a radio station.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | radio direction-finding station | 5 | A radio station intended only to determine the direction of other stations by means of transmission from the latter. |
| Literal | Decca | 8 | The Decca Navigator System is a high-accuracy, short to medium range radio navigation aid intended for coastal and landfall navigation. |
| Literal | Loran C | 9 | A low frequency electronic position fixing system using pulsed transmissions at 100 Khz. |
| Literal | Differential GNSS | 10 | A radiobeacon transmitting DGPS correction signals. |
| Literal | Toran | 11 | An electronic position fixing system used mainly by aircraft. |
| Literal | Omega | 12 | A long-range radio navigational aid which operates within the VLF frequency band. The system comprises eight land based stations. |
| Literal | Syledis | 13 | A ranging position fixing system operating at 420-450MHz over a range of up to 400 Km. |
| Literal | Chaika | 14 | A low frequency electronic position fixing system using pulsed transmissions at 100 Khz. |
| Literal | facsimile transmission | 17 | facsimile transmission (IHO HYDRO register, 2010-11-14) |
| Literal | radio telephone station | 19 | The equipment needed at one station to carry on two way voice communication by radio waves only. |
| Literal | AIS base station | 20 | Remark: Not defined in GI Registry (2017-04-20). |

### categoryOfRelationship

Enumeration

*Definition:* Expresses constraints or requirements on vessel actions or activities in relation to a geographic feature, facility, or service.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | prohibited | 1 | use of facility, waterway or service is forbidden |
| Literal | not recommended | 2 | use of facility, waterway or service is not recommended |
| Literal | permitted | 3 | use of facility, waterway, or service is permitted but not required |
| Literal | recommended | 4 | use of facility, waterway, or service is recommended |
| Literal | required | 5 | use of facility, waterway, or service is required |
| Literal | not required | 6 | use of facility, waterway or service is not required |

### categoryOfText

Enumeration

*Definition:* Classification of completeness of textual information in relation to the source.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | abstract or summary | 1 | A statement summarizing the important points of a text. |
| Literal | extract | 2 | An excerpt or excerpts from a text. |
| Literal | full text | 3 | The whole text |

### categoryOfVesselRegistry

Enumeration

*Definition:* The locality of vessel registration or enrolment relative to the nationality of a port, territorial sea, administrative area, exclusive zone or other location.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | domestic | 1 | The vessel is registered or enrolled under the same national flag as the port, harbour, territorial sea, exclusive economic zone, or administrative area in which the object that possesses this attribute applies or is located. |
| Literal | foreign | 2 | The vessel is registered or enrolled under a national flag different from the port, harbour, territorial sea, exclusive economic zone, or other administrative area in which the object that possesses this attribute applies or is located. |

### comparisonOperator

Enumeration

*Definition:* Numerical comparison.

Remarks: The definition of COMPOP provides the relation between the value given in the model and the real ship's value.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | greater than | 1 | The value of the left value is greater than that of the right.(http://en.wikipedia.org/wiki/Logical\_connective) |
| Literal | greater than or equal to | 2 | The value of the left expression is greater than or equal to that of the right. (http://en.wikipedia.org/wiki/Logical\_connective) |
| Literal | less than | 3 | The value of the left expression is less than that of the right. (http://en.wikipedia.org/wiki/Logical\_connective) |
| Literal | less than or equal to | 4 | The value of the left expression is less than or equal to that of the right. (http://en.wikipedia.org/wiki/Logical\_connective) |
| Literal | equal to | 5 | The two values are equivalent. (adapted http://en.wikipedia.org/wiki/Logical\_connective) |
| Literal | not equal to | 6 | The two values are not equivalent. (adapted http://en.wikipedia.org/wiki/Logical\_connective) |

### dayOfWeek

Enumeration

*Definition:* The days of the week.

Remarks: This is an ordered enumeration.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | monday | 1 | monday  the day of the week before Tuesday and following Sunday |
| Literal | tuesday | 2 | the day of the week before Wednesday and following Monday |
| Literal | wednesday | 3 | wednesday  the day of the week before Thursday and following Tuesday |
| Literal | thursday | 4 | thursday  the day of the week before Friday and following Wednesday |
| Literal | friday | 5 | friday  the day of the week before Saturday and following Thursday |
| Literal | saturday | 6 | saturday  the day of the week before Sunday and following Friday (together with Sunday forming part of the weekend) |
| Literal | sunday | 7 | sunday  the day of the week before Monday and following Saturday (together with Saturday forms part of the weekend) |

### function

Enumeration

*Definition:* A specific role that describes a feature

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | communication | 29 | Transmitting and/or receiving electronic communication signals. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010). |
| Literal | radio | 31 | Transmitting and/or receiving radio-frequency electromagnetic waves as a means of communication. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010). |
| Literal | microwave | 34 | Broadcasting and receiving signals using microwaves. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.133, November 2000). |
| Literal | control | 39 | Used to control the flow of traffic within a specified range of an installation. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010). |
| Literal | sea rescue control | 44 | A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region. (Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010). |

### jurisdiction

Enumeration

*Definition:* The jurisdiction applicable to an administrative area.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | international | 1 | involving more than one country; covering more than one national area. |
| Literal | national | 2 | an area administered or controlled by a single nation. |
| Literal | national sub-division | 3 | an area smaller than the nation in which it lies. |

### logicalConnectives

Enumeration

*Definition:* Expresses whether all the constraints described by its co-attributes must be satisfied, or only one such constraint need be satisfied.

Remarks:

* This attribute is intended to be used with co-attributes that encode limits on vessel dimensions, type of cargo, and other characteristics.
* The combination of constraints described by logicalConnective and its co-attributes defines a subset of vessels to which information described by a feature or information type instance applies (or does not apply, is required, recommended, etc.).
* The relationship between the vessel subset and the information is indicated by an association - see PermissionType and InclusionType).
* The two listed values of logicalConnective are two of the basic operations of Boolean logic. The third basic operation (not) is not used.

Example:

An Applicability object with attributes as below:

logicalConnectives=1

vesselsMeasurements [vesselsCharacteristics=10/vesselsCharacteristicsValue=50.0/ComparisonOperator=1]

vesselsMeasurements [vesselsCharacteristics=6/vesselsCharacteristicsValue=10.0/ComparisonOperator=1]

implies the limitation applies only when LOA (code 10) is greater than 50.0 and draught (code 6) is greater than 10.0

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | logical conjunction | 1 | all the conditions described by the other attributes of the object, or sub-attributes of the same complex attribute, are true |
| Literal | logical disjunction | 2 | at least one of the conditions described by the other attributes of the object, or sub-attributes of the same complex attributes, is true |

### membership

Enumeration

*Definition:* Indicates whether a vessel is included or excluded from the regulation / restriction / recommendation / nautical information

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | included | 1 | Vessels with these characteristics are included in the regulation/restriction/recommendation/nautical information. |
| Literal | excluded | 2 | Vessels with these characteristics are excluded from the regulation/restriction/recommendation/nautical information. |

### operation

Enumeration

*Definition:* Indicates whether the minimum or maximum value should be used to describe a condition or in application processing.

Remarks:

* Attribute operation is intended to be used in conjunction with other attributes (or sub-attributes of a complex attribute) to indicate how their values must be combined in order to describe a condition.
* Null attributes are ignored.

Example: Complex attribute underkeelAllowance with UKCFIX=2.5, UKCVAR=10.00, operation=1 indicates that the under-keel allowance required is the greater of 2.5 metres or 10% of the ship's draught.

Remarks: OPERAT is intended to be used in conjunction with other attributes (or sub-attributes of a complex attribute) to indicate how their values must be combined in order to describe a condition. Null attributes are ignored.

Example: Complex attribute underkeelAllowance with UKCFIX=2.5, UKCVAR=10.00, OPERAT=1 inicates that the under-keel allowance required is the greater of 2.5 metres or 10% of the ship's draught.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | largest value | 1 | The numerically largest value computed from the applicable attributes or sub-attributes |
| Literal | smallest value | 2 | The numerically smallest value computed from the applicable attributes or sub-attributes |

### restriction

Enumeration

*Definition:* The official legal statute of each kind of restricted area.

Remarks: Defines the kind of restriction(s), e.g., the restriction for 'a game preserve' may be 'entry prohibited', the restriction for an 'anchoring prohibition' is 'anchoring prohibited'.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | anchoring prohibited | 1 | An area within which anchoring is not permitted. |
| Literal | anchoring restricted | 2 | a specified area designated by appropriate authority, within which anchoring is restricted in accordance with certain specified conditions. |
| Literal | fishing prohibited | 3 | An area within which fishing is not permitted. |
| Literal | fishing restricted | 4 | a specified area designated by appropriate authority, within which fishing is restricted in accordance with certain specified conditions. |
| Literal | trawling prohibited | 5 | An area within which trawling is not permitted. |
| Literal | trawling restricted | 6 | a specified area designated by appropriate authority, within which trawling is restricted in accordance with certain specified conditions. |
| Literal | entry prohibited | 7 | An area within which navigation and/or anchoring is prohibited. |
| Literal | entry restricted | 8 | a specified area designated by appropriate authority, within which navigation is restricted in accordance with certain specified conditions. |
| Literal | dredging prohibited | 9 | An area within which dredging is not permitted. |
| Literal | dredging restricted | 10 | a specified area designated by appropriate authority, within which dredging is restricted in accordance with certain specified conditions. |
| Literal | diving prohibited | 11 | An area within which diving is not permitted. |
| Literal | diving restricted | 12 | a specified area designated by appropriate authority, within which diving is restricted in accordance with certain specified conditions. |
| Literal | no wake | 13 | Mariners must adjust the speed of their vessels to reduce the wave or wash which may cause erosion or disturb moored vessels. |
| Literal | area to be avoided | 14 | An IMO declared routeing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ships. |
| Literal | construction prohibited | 15 | The erection of permanent or temporary fixed structures or artificial islands is prohibited. |
| Literal | discharging prohibited | 16 | An area in which discharging or dumping is prohibited. |
| Literal | discharging restricted | 17 | A specified area designated by appropriate authority, within which discharging or dumping is restricted in accordance with certain specified conditions. |
| Literal | industrial or mineral exploration/development prohibited | 18 | An area in which industrial or mineral exploration and development are prohibited. |
| Literal | industrial or mineral exploration/development restricted | 19 | A specified area designated by appropriate authority, within which industrial or mineral exploration and development is restricted in accordance with certain specified conditions. |
| Literal | drilling prohibited | 20 | An area in which excavating a hole on the seabed with a drill is prohibited. |
| Literal | drilling restricted | 21 | A specified area designated by appropriate authority, within which excavating a hole on the seabed with a drill is restricted in accordance with certain specified conditions. |
| Literal | removal of historical artifacts prohibited | 22 | An area in which the removal of historical artifacts is prohibited. |
| Literal | cargo transhipment (lightering) prohibited | 23 | An area in which cargo transhipment (lightering) is prohibited. |
| Literal | dragging prohibited | 24 | An area in which the dragging or anything along the seabed, e.g., bottom trawling, is prohibited. |
| Literal | stopping prohibited | 25 | An area in which a vessel is prohibited from stopping. |
| Literal | landing prohibited | 26 | An area in which landing is prohibited. |
| Literal | speed restricted | 27 | An area in which speed is restricted. |
| Literal | swimming prohibited | 28 | An area in which swimming is prohibited. |

### sourceType

Enumeration

*Definition:* The type of source.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | law or regulation | 1 | treaty, convention, or international agreement; law or regulation issued by a national or other authority |
| Literal | official publication | 2 | publication not having the force of law, issued by an international organisation or a national or local administration |
| Literal | mariner report, confirmed | 7 | Reported by mariner(s) and confirmed by another source |
| Literal | mariner report, not confirmed | 8 | reported by mariner(s) but not confirmed |
| Literal | industry publications and reports | 9 | shipping and other industry publication, including graphics, charts and web sites |
| Literal | remotely sensed images | 10 | information obtained from satellite images |
| Literal | photographs | 11 | information obtained from photographs |
| Literal | products issued by HO services | 12 | information obtained from products issued by Hydropgrahic Offices |
| Literal | news media | 13 | information obtained from news media |
| Literal | traffic data | 14 | information obtained from the analysis of traffic data |

### status

Enumeration

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

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | permanent | 1 | Intended to last or function indefinitely |
| Literal | occasional | 2 | Acting on special occasions; happening irregularly |
| Literal | recommended | 3 | Presented as worthy of confidence, acceptance, use, etc. |
| Literal | not in use | 4 | Use has ceased, but the facility still exists intact; disused. |
| Literal | periodic/intermittent | 5 | Recurring at intervals |
| Literal | reserved | 6 | Set apart for some specific use |
| Literal | temporary | 7 | Meant to last only for a time |
| Literal | private | 8 | Administered by an individual or corporation, rather than a State or a public body. |
| Literal | mandatory | 9 | Compulsory; enforced. |
| Literal | extinguished | 11 | No longer lit |
| Literal | illuminated | 12 | Lit by floodlights, strip lights, etc. |
| Literal | historic | 13 | Famous in history; of historical interest |
| Literal | public | 14 | Belonging to, available to, used or shared by, the community as a whole and not restricted to private use. |
| Literal | synchronised | 15 | Occur at a time, coincide in point of time, be contemporary or simultaneous |
| Literal | watched | 16 | Looked at or observed over a period of time especially so as to be aware of any movement or change. |
| Literal | un-watched | 17 | Usually automatic in operation, without any permanently-stationed personnel to superintend it. |
| Literal | existence doubtful | 18 | A feature that has been reported but has not been definitely determined to exist. |
| Literal | buoyed | 28 | Marked by buoys |

### timeReference

Enumeration

*Definition:* Indicates whether a time value is local time or Coordinated Universal Time.

**Remark**: Local time is the local civil time after daylight savings time (if any) has been applied. For example 0800 local time in New York is the same instant as 1300 UTC on December 1, when DST is **not** in effect in New York, and 1200 UTC on June 1, when DST **is** in effect in New York.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | localTime | 1 | Local time |
| Literal | UTC | 2 | Coordinated Universal time |

### transmissionRegularity

Enumeration

*Definition:*

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | continuous |  | transmission is made continuously |
| Literal | regular |  | transmission is made regularly according to a schedule |
| Literal | on receipt |  | transmission is made when warning or information is received from another authority |
| Literal | as required |  | transmission is made under specified conditions or when needed |
| Literal | on request |  | transmission is made when requested by a user |

### vesselsCharacteristics

Enumeration

*Definition:* Characteristics of vessels.

Remarks:

This is an enumeration of different properties of vessels which are often used in specifying whether they are subject to rules or restrictions.

The properties covered by this attribute are those of the vessel itself, such as dimensional and tonnage properties. The type of vessel and the cargo carried by a vessel are characterized by different attributes (see categoryOfVessel, categoryOfCargo, categoryOfDangerousOrHazardousCargo).

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | length overall | 1 | The maximum length of the ship (L.O.A.). (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | length at waterline | 2 | The ship's length measured at the waterline (L.W.L.). (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | breadth | 3 | The width or beam of the vessel. (Adapted from http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | draught | 4 | The depth of water necessary to float a vessel fully loaded. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | height | 5 | The height of the highest point of a vessel's structure (e.g. radar aerial, funnel, cranes, masthead) above her waterline.  (UKHO NP100/2009) |
| Literal | displacement tonnage | 6 | A measurement of the weight of the vessel, usually used for warships. (Merchant ships are usually measured based on the volume of cargo space; see tonnage). Displacement is expressed either in long tons of 2,240 pounds or metric tonnes of 1,000 kg. Since the two units are very close in size (2,240 pounds = 1,016 kg and 1,000 kg = 2,205 pounds), it is common not to distinguish between them. To preserve secrecy, nations sometimes misstate a warship's displacement. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | displacement tonnage, light | 7 | The weight of the ship excluding cargo, fuel, ballast, stores, passengers, and crew, but with water in the boilers to steaming level. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | displacement tonnage, loaded | 8 | The weight of the ship including cargo, passengers, fuel, water, stores, dunnage and such other items necessary for use on a voyage, which brings the vessel down to her load draft. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | deadweight tonnage | 9 | The difference between displacement, light and displacement, loaded. A measure of the ship's total carrying capacity. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | gross tonnage | 10 | The entire internal cubic capacity of the ship expressed in tons of 100 cubic feet to the ton, except certain spaces with are exempted such as: peak and other tanks for water ballast, open forecastle bridge and poop, access of hatchways, certain light and air spaces, domes of skylights, condenser, anchor gear, steering gear, wheel house, galley and cabin for passengers. (http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | net tonnage | 11 | Obtained from the gross tonnage by deducting crew and navigating spaces and allowances for propulsion machinery.(http://en.wikipedia.org/wiki/Ship\_measurements; 24 July 2010) |
| Literal | Panama Canal/Universal Measurement System net tonnage | 12 | the Panama Canal/Universal Measurement System (PC/UMS) is based on net tonnage, modified for Panama Canal purposes. PC/UMS is based on a mathematical formula to calculate a vessel's total volume; a PC/UMS net ton is equivalent to 100 cubic feet of capacity.  (Adapted from http://en.wikipedia.org/wiki/Tonnage 4 Oct 2010) |
| Literal | Suez Canal net tonnage | 13 | the Suez Canal Net Tonnage (SCNT) is derived with a number of modifications from the former net register tonnage of the Moorsom System and was established by the International Commission of Constantinople in its Protocol of 18 December 1873. It is still in use, as amended by the Rules of Navigation of the Suez Canal Authority, and is registered in the Suez Canal Tonnage Certificate.  (Adapted from http://en.wikipedia.org/wiki/Tonnage 4 Oct 2010) |

### vesselsCharacteristicsUnit

Enumeration

*Definition:* the unit used for vessel characteristics attribute

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | metre | 1 | The metre (or meter) is the base unit of length in the International System of Units (SI). It is defined as the distance travelled by light in vacuum in 1/299,792,458 of a second. |
| Literal | foot | 2 | A foot (plural: feet) is a non-SI unit of length in a number of different systems including English units, Imperial units, and United States customary units. The most commonly used foot today is the international foot. There are three feet in a yard and 12 inches in a foot. |
| Literal | metric ton | 3 | The tonne or metric ton (U.S.), often redundantly referred to as a metric tonne, is a unit of mass equal to 1,000 kg (2,205 lb) or approximately the mass of one cubic metre of water at four degrees Celsius. It is sometimes abbreviated as mt in the United States, but this conflicts with other SI symbols. The tonne is not a unit in the International System of Units (SI), but is accepted for use with the SI. In SI units and prefixes, the tonne is a megagram (Mg). The Imperial and US customary units comparable to the tonne are both spelled ton in English, though they differ in mass. Pronunciation of tonne (the word used in the UK) and ton is usually identical, but is not too confusing unless accuracy is important as the tonne and UK long ton differ by only 1.6%. |
| Literal | ton | 4 | Long ton (weight ton or imperial ton) is the name for the unit called the "ton" in the avoirdupois or Imperial system of measurements, as used in the United Kingdom and several other Commonwealth countries. It has been mostly replaced by the tonne, and in the United States by the short ton. One long ton is equal to 2,240 pounds (1,016 kg) or 35 cubic feet (0.9911 m3) of salt water with a density of 64 lb/ft³ (1.025 g/ml). It has some limited use in the United States, most commonly in measuring the displacement of ships, and was the unit prescribed for warships by the Washington Naval Treaty—for example battleships were limited to a mass of 35,000 long tons (36,000 t; 39,000 ST). |
| Literal | short ton | 5 | The short ton is a unit of weight equal to 2,000 pounds (907.18474 kg). In the United States it is often called simply ton without distinguishing it from the metric ton (tonne, 1,000 kilograms) or the long ton (2,240 pounds / 1,016.0469088 kilograms); rather, the other two are specifically noted. There are, however, some U.S. applications for which unspecified tons normally means long tons (for example, Navy ships) or metric tons (world grain production figures).  Both the long and short ton are defined as 20 hundredweights, but a hundredweight is 100 pounds (45.359237 kg) in the U.S. system (short or net hundredweight) and 112 pounds (50.80234544 kg) in the Imperial system (long or gross hundredweight). |
| Literal | gross ton | 6 | Gross tonnage (GT) is a function of the volume of all ship's enclosed spaces (from keel to funnel) measured to the outside of the hull framing. There is a sliding scale factor. So GT is a kind of capacity-derived index that is used to rank a ship for purposes of determining manning, safety and other statutory requirements and is expressed simply as GT, which is a unitless entity, even though its derivation is tied to the cubic meter unit of volumetric capacity.  Tonnage measurements are now governed by an IMO Convention (International Convention on Tonnage Measurement of Ships, 1969 (London-Rules)), which applies to all ships built after July 1982. In accordance with the Convention, the correct term to use now is GT, which is a function of the moulded volume of all enclosed spaces of the ship. |
| Literal | net ton | 7 | Net tonnage (NT) is based on a calculation of the volume of all cargo spaces of the ship. It indicates a vessel’s earning space and is a function of the moulded volume of all cargo spaces of the ship. |
| Literal | Panama Canal/Universal Measurement System net tonnage | 8 | The Panama Canal/Universal Measurement System (PC/UMS) is based on net tonnage, modified for Panama Canal purposes. PC/UMS is based on a mathematical formula to calculate a vessel's total volume; a PC/UMS net ton is equivalent to 100 cubic feet of capacity. |
| Literal | Suez Canal Net Tonnage | 9 | The Suez Canal Net Tonnage (SCNT) is derived with a number of modifications from the former net register tonnage of the Moorsom System and was established by the International Commission of Constantinople in its Protocol of 18 December 1873. It is still in use, as amended by the Rules of Navigation of the Suez Canal Authority, and is registered in the Suez Canal Tonnage Certificate. |
| Literal | none | 10 | Can be used for net and gross tonnages, including Panama Canal/Universal Measurement System net tonnage and The Suez Canal Net Tonnage. |
| Literal | cubic metres | 11 | cubic metres |

# S-123 Meta Features (package)

## Features

### DataQuality

**Class Super-type:**

Abstract feature type for data quality meta-features

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | information | [0..\*] | information | Use of attribute **information** is discouraged for nautical publications data quality meta-features. |
| «S100\_Spatial» | geometry | [1..\*] | GM\_OrientableSurface | Permitted spatial primitives |

#### Inherited Attributes

#### Associations

### QualityOfTemporalVariation

**Class Super-type: DataQuality**

Abstract type for meta-feature which can describe temporal variation.

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfTemporalVariation | [1] | categoryOfTemporalVariation | (1, 2, 3, 5) |
| Attribute | dataAssessment | [1] | dataAssessment | The categorisation of the assessment level of bathymetric data for an area. |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| «S100\_Spatial» | geometry | [1..\*] | GM\_OrientableSurface | Permitted spatial primitives |
| Complex Attribute | information | [0..\*] | information | Use of attribute **information** is discouraged for nautical publications data quality meta-features. |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| Surveys  *Association* | *Label:* QualityOfSurvey  *Role:* specificClassification  *Multiplicity:* 0..\*  Ordered: 0 | *Label:* QualityOfTemporalVariation  *Role:* overallClassification  *Multiplicity:*  Ordered: 0 | UNDEFINED |

### DataCoverage

**Class Feature Super-type:**

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

*Tag*: byValuePropertyType false Values: true,false

Default: false

Description: Create a named complex type ( property type ) that requires the instance to be encoded inline

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | maximumDisplayScale | [1] | Integer | maximumDisplayScale < minimumDisplayScale  (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15) |
| Attribute | minimumDisplayScale | [1] | Integer | minimumDisplayScale > maximumDisplayScale  (2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15) |
| «S100\_Spatial» | geometry | [1..\*] | GM\_OrientableSurface | Permitted spatial primitives |

#### Inherited Attributes

#### Associations

### QualityOfNonbathymetricData

**Class Feature Super-type: QualityOfTemporalVariation**

An area within which a uniform assessment of the quality of the non-bathymetric data exists.

*Tag*: byValuePropertyType false Values: true,false

Default: false

Description: Create a named complex type ( property type ) that requires the instance to be encoded inline

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | horizontalDistanceUncertainty | [0..\*] | Real | The best estimate of the horizontal accuracy of horizontal clearances and distances. |
| Complex Attribute | horizontalPositionalUncertainty | [0..1] | horizontalPositionalUncertainty | The best estimate of the accuracy of a position. |
| Attribute | directionUncertainty | [0..1] | Real | The best estimate of the accuracy of a bearing |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | surveyDateRange | [0..1] | surveyDateRange |  |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfTemporalVariation | [1] | categoryOfTemporalVariation |  |
| Attribute | dataAssessment | [1] | dataAssessment | The categorisation of the assessment level of bathymetric data for an area. |
| «S100\_Spatial» | geometry | [1..\*] | GM\_OrientableSurface | Permitted spatial primitives |
| Complex Attribute | information | [0..\*] | information | Use of attribute **information** is discouraged for nautical publications data quality meta-features. |

#### Associations

## Information types

### SpatialQuality

**Class Information Type Super-type:**

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfTemporalVariation | [0..1] | categoryOfTemporalVariation | (1, 2, 3, 5) |
| Complex Attribute | horizontalPositionalUncertainty | [0..1] | horizontalPositionalUncertainty |  |
| Attribute | qualityOfHorizontalMeasurement | [0..1] | QUAPOS |  |

#### Inherited Attributes

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| *Realization* | *Label:* SpatialQuality  *Role:*  *Multiplicity:*  Ordered: 0 | *Label:* S100\_GF\_InformationType  *Role:*  *Multiplicity:*  Ordered: 0 |  |
| spatialAssociation  *Association* | *Label:* GM\_OrientableCurve  *Role:* definedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* SpatialQuality  *Role:* defines  *Multiplicity:* 0..1  Ordered: 0 |  |

### SpatialQualityPoints

**Class Information Type Super-type: SpatialQuality**

Definition required

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | categoryOfTemporalVariation | [0..1] | categoryOfTemporalVariation |  |
| Complex Attribute | horizontalPositionalUncertainty | [0..1] | horizontalPositionalUncertainty |  |
| Attribute | qualityOfHorizontalMeasurement | [0..1] | QUAPOS |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| spatialAssociation  *Association* | *Label:* GM\_Point  *Role:* definedFor  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* SpatialQualityPoints  *Role:* defines  *Multiplicity:* 0..1  Ordered: 0 |  |

## Complex attributes

### horizontalPositionalUncertainty

**Class Complex Attribute Super-type:**

Definition required

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | uncertaintyFixed | [1] | Real | Definition required |
| Attribute | uncertaintyVariable | [0..1] | Real | Definition required |

#### Inherited Attributes

#### Associations

### surveyDateRange

**Class Complex Attribute Super-type:**

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 | dateStart | [1] | S100\_TruncatedDate | The start date or time of the interval. |
| Attribute | dateEnd | [1] | S100\_TruncatedDate | The end date or time of the interval. |

#### Inherited Attributes

#### Associations

## Enumerations

### dataAssessment

Enumeration

*Definition:* The categorisation of the assessment level of bathymetric data for an area.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | assessed | 1 | The quality of the bathymetric data has been assessed. |
| Literal | oceanic | 2 | The quality of oceanic bathymetric data has been assessed or is not required. |
| Literal | unassessed | 3 | The quality of the bathymetric data has yet to be assessed. |

### QUAPOS

Enumeration

*Definition:* Definition required

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | surveyed | 1 | The position(s) was(were) determined by the operation of making measurements for determining the relative position of points on, above, or beneath the earth's surface. Survey implies a regular, controlled, survey of any date. |
| Literal | unsurveyed | 2 | Survey data does not exist or is very poor |
| Literal | inadequately surveyed | 3 | Position data is of very poor quality |
| Literal | approximate | 4 | A position that is considered to be less than third-order accuracy, but is generally considered to be within 30.5 meters of its correct geographic location. Also, may apply to a feature whose position does not remain fixed. |
| Literal | position doubtful | 5 | A feature whose position has been reported but which is considered to be doubtful |
| Literal | unreliable | 6 | A feature's position obtained from questionable or unreliable data. |
| Literal | reported (not surveyed) | 7 | A feature whose position has been reported and its position confirmed by some means other than a formal survey such as an independent report of the same feature. |
| Literal | reported (not confirmed | 8 | A feature whose position has been reported and its position has not been confirmed. |
| Literal | estimated | 9 | The most probable position of a feature determined from incomplete data or data of questionable accuracy. |
| Literal | precisely known | 10 | A position that is of a known value, such as the position of an anchor berth or other defined feature. |
| Literal | calculated | 11 | A position that is computed from data. |

### categoryOfTemporalVariation

Enumeration

*Definition:* An assessment of the likelihood of change within an area since last survey.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | extreme event | 1 | NIPWG: No new hydrographic survey conducted after an event (e.g., hurricane, earthquake, volcanic eruption, landslide, etc.) which is considered likely to have resulted in significant change at the location.  In GI Registry  Definition: 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 | 2 | NIPWG: Continuous or frequent change (e.g., river siltation, sand waves, seasonal storms, construction, etc.)  GI Registry:  Continuous or frequent change (e.g. river siltation, sand waves, seasonal storms, ice bergs, etc). |
| Literal | likely to change but significant shoaling not expected | 3 | GI Registry: Likely to change but significant shoaling no expected  [Proposed draft 6/27/2014: Recommended that SNPWG not use this enumerate - ref. E.M. email 6/27/2014.] |
| Literal | unlikely to change | 4 | NIPWG: Significant change at the location is not expected.  GI Registry: Significant change to the seafloor is not expected. |
| Literal | unassessed | 5 | Temporal variation not assessed or cannot be determined |

# S-123 Cartographic Features (package)

## Features

### TextPlacement

**Class Feature Super-type:**

The Text Placement feature is used in association with the Feature

Name attribute or a light description to optimise text positioning in ECDIS.

Remarks:

* The **Text Placement** feature is used by the ECDIS to position the associated text, which has been populated using an attribute(s) for the related feature. This attribute is identified by populating the attribute **text type**. Alternatively, the text to be displayed may be encoded using the attribute **text**.
* Only one of the attributes **text** or **text type** are allowable for each instance of **Text Placement**.
* **Text Placement** should only be associated with features of type point, and used in areas where it is important that text clear navigationally relevant areas, e.g. shipping channels and dredged areas.

*Tag*: byValuePropertyType false Values: true,false

Default: false

Description: Create a named complex type ( property type ) that requires the instance to be encoded inline

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | flipBearing | [0..1] | Real | The bearing at which text is re-located to the opposite side of a feature when screen display is oriented away from true north. |
| Attribute | scaleMinimum | [0..1] | Integer |  |
| Attribute | textJustification | [1] | textJustification | The anchor point of a text string. |
| Attribute | text | [0..1] | text | A non-formatted digital text string.  Remarks:  The attributeshould be used, for example, to hold the information that is shown on paper charts by short cautionary and explanatory notes. Therefore text populated in text must not exceed 300 characters.  Text may be in English or in a national language defined by the attribute **language**.  No formatting of text is possible within the sub-attribute **text**. If formatted text, or text strings exceeding 300 characters, is required, then the attribute **file reference** must be used. |
| Attribute | textType | [0..1] | textType |  |
| «S100\_Spatial» | geometry | [1..\*] | GM\_Point |  |

#### Inherited Attributes

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| textAssociation  *Association* | *Label:* FeatureType  *Role:* identifies  *Multiplicity:* 0..1  Ordered: 0 | *Label:* TextPlacement  *Role:* positions  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between a geo feature and the cartographically positioned location for text. |

## Enumerations

### textJustification

Enumeration

*Definition:* The anchor point of a text string.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | left | 1 | The anchor point is at the start of the text string. |
| Literal | centred | 2 | The anchor point is at the centre of the text string. |
| Literal | right | 3 | The anchor point is at the end of the text string. |

### textType

Enumeration

*Definition:* The attribute from which a text string is derived.

(S-122) Remark: S-122 does not include light features and therefore listed value '2: light characteristic' is omitted from the S-122 application schema.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | feature name | 1 | Definition required |

# S-123 Approximate Areas (package)

## Features

### ForecastAreaAggregate

**Class Feature Super-type: FuzzyAreaAggregate**

Aggregation of areas where forecasts and warnings broadcasted for a **Weather forecast and warning area** may be available with differing levels of reliability.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| coreAggregation  *Aggregation* | *Label:* WeatherForecastWarningArea  *Role:* consistsOf  *Multiplicity:*  Ordered: 0 | *Label:* ForecastAreaAggregate  *Role:* componentOf  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and a geographic feature describing the service or phenomenon. (IHO). |

### RadioServiceAreaAggregate

**Class Feature Super-type: FuzzyAreaAggregate**

Aggregation of areas where radio services from a single radio service are available to different levels of reliability

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| coreAggregation  *Aggregation* | *Label:* RadioServiceArea  *Role:* consistsOf  *Multiplicity:*  Ordered: 0 | *Label:* RadioServiceAreaAggregate  *Role:* componentOf  *Multiplicity:* 0..1  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and a geographic feature describing the service or phenomenon. (IHO). |

### FuzzyAreaAggregate

**Class Feature Super-type: FeatureType**

Aggregation of a geographic feature describing a service or phenomenon with zones of different confidence about the availability of the service, occurrence of the phenomenon, or applicability of the information described by the geographic feature.

#### Attributes

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| fuzzyZoneAggregation  *Aggregation* | *Label:* IndeterminateZone  *Role:* consistsOf  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* FuzzyAreaAggregate  *Role:* componentOf  *Multiplicity:*  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and zones of uncertainty about the service or phenomenon. (IHO). |
| coreAggregation  *Aggregation* | *Label:* GenericGeographicFeature  *Role:* consistsOf  *Multiplicity:*  Ordered: 0 | *Label:* FuzzyAreaAggregate  *Role:* componentOf  *Multiplicity:*  Ordered: 0 |  |

### IndeterminateZone

**Class Feature Super-type: FeatureType**

A region in which the perception of a phenomenon or the availability of a service is known only to a specified level of confidence.

Remark: **IndeterminateZone** features associated to the same fuzzy area aggregate must not overlap.

*Constraint*: 0 < fuzzyPercentage < 100

#### Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Attribute | informationConfidence | [1] | informationConfidence |  |
| «S100\_Spatial» | geometry | [1] | GM\_OrientableSurface | Fuzzy region spatial attribute |

#### Inherited Attributes

| *Role Name* | *Name* | *Multiplicity* | *Data type* | *Description / Remarks* |
| --- | --- | --- | --- | --- |
| Complex Attribute | featureName | [0..\*] | featureName |  |
| Complex Attribute | fixedDateRange | [0..1] | fixedDateRange |  |
| Complex Attribute | periodicDateRange | [0..\*] | periodicDateRange |  |
| Complex Attribute | sourceIndication | [0..1] | sourceIndication |  |
| Complex Attribute | textContent | [0..\*] | textContent |  |

#### Associations

| *Association name* | *Source* | *Target* | *Notes* |
| --- | --- | --- | --- |
| fuzzyZoneAggregation  *Aggregation* | *Label:* IndeterminateZone  *Role:* consistsOf  *Multiplicity:* 1..\*  Ordered: 0 | *Label:* FuzzyAreaAggregate  *Role:* componentOf  *Multiplicity:*  Ordered: 0 | A feature association for the binding between an aggregation feature that describes areas of varying uncertainty about a service or phenomenon and zones of uncertainty about the service or phenomenon. (IHO). |

## Enumerations

### informationConfidence

Enumeration

*Definition:* The likelihood that a vessel will experience the phenomenon described by a feature, or that the service described by the feature will be available.

#### Listed Values

| *Role Name* | *Name* | *Code* | *Description / Remarks* |
| --- | --- | --- | --- |
| Literal | virtuallyCertain | 1 | Virtually certain to be experienced by (or available to) an individual vessel; will be experienced by nearly all vessels. (FAA, adapted.) |
| Literal | highLikelihood | 2 | Frequently experienced by (or available to) an individual vessel; experienced by a majority of vessels. (FAA, adapted.) |
| Literal | mediumLikelihood | 3 | Occasionally experienced by (or available to) an individual vessel; experienced by (or available to) about half of all vessels. (FAA, adapted.) |
| Literal | lowLikelihood | 4 | Unlikely, but sometimes (rarely) experienced by (or available to) an individual vessel; experienced by (or available to) a minority of vessels). (FAA, adapted.) |