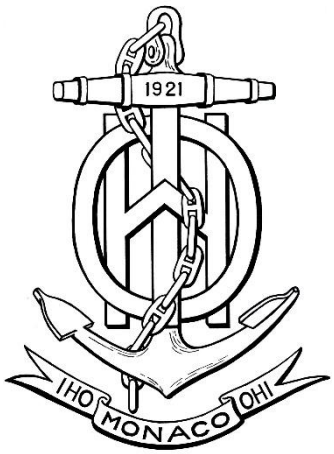
INTERNATIONAL HYDROGRAPHIC ORGANIZATION



MARINE PROTECTED AREA PRODUCT SPECIFICATION

IHO Publication S-122

Appendix B
Application Schema Documentation

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1 S-122 Domain Model (package)

Marine Protected Area

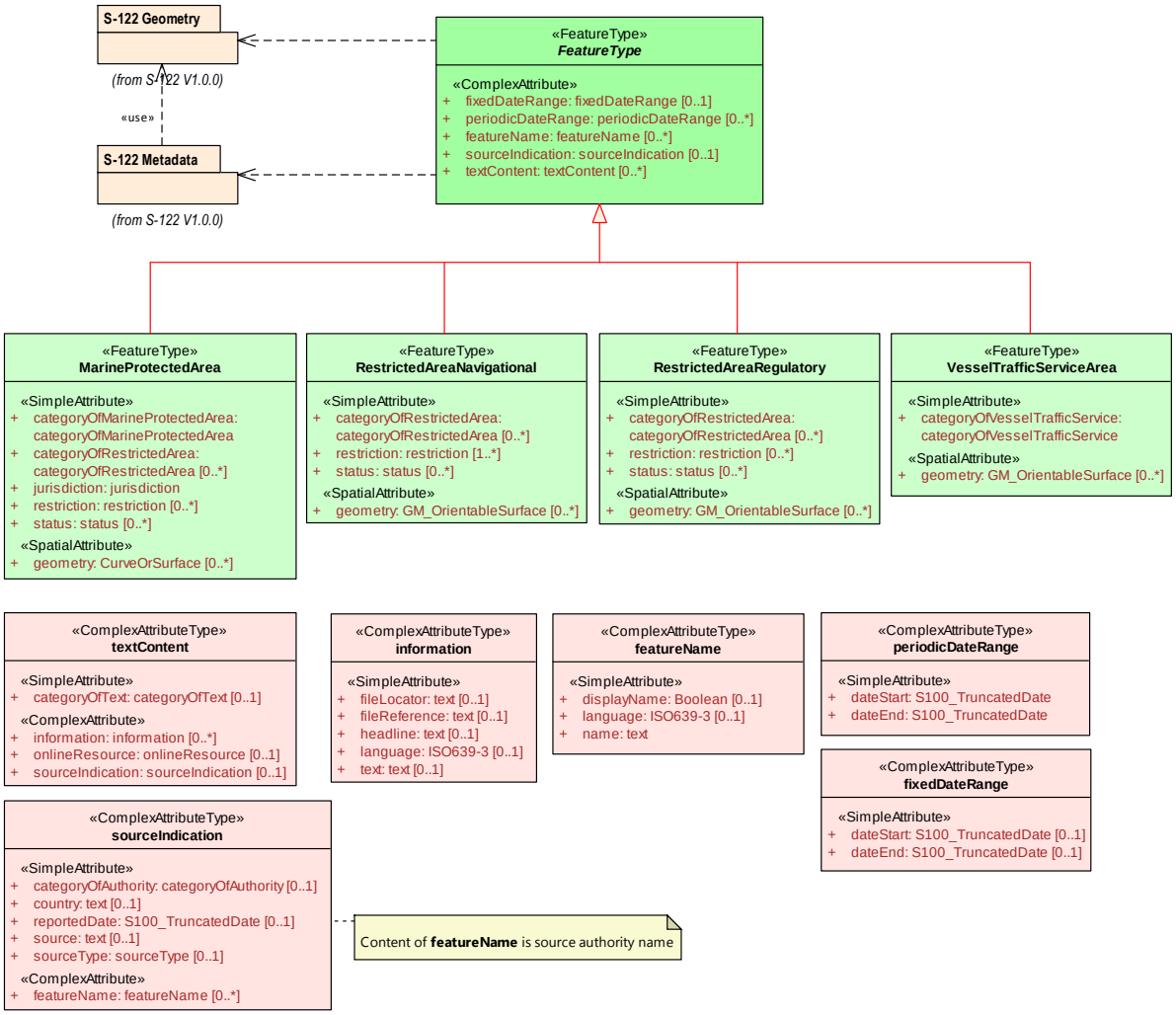

Figure 1 FeatureTypes

Diagram Notes:

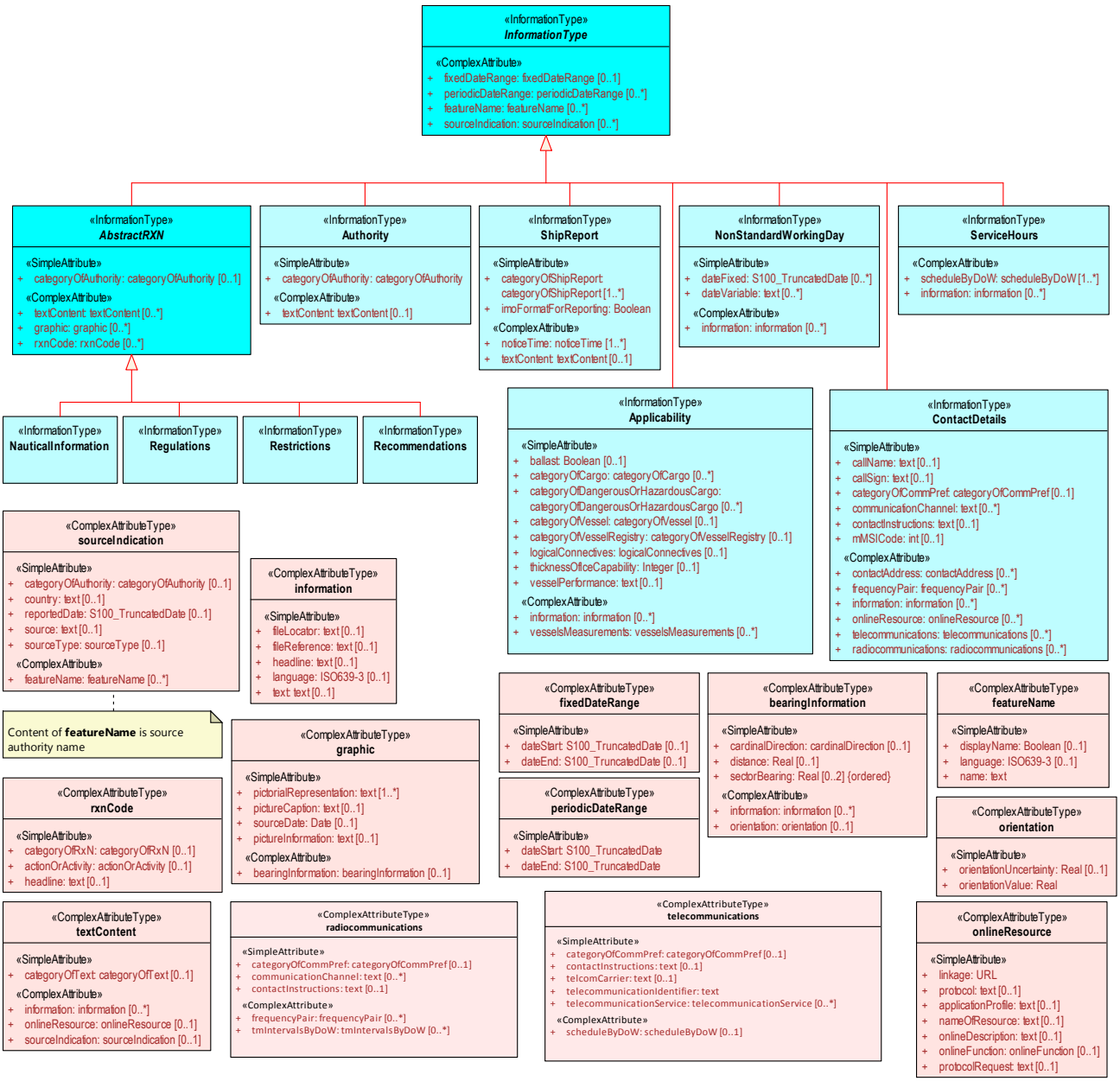

Figure 2 InfoTypesShowingAttributes

Diagram Notes:

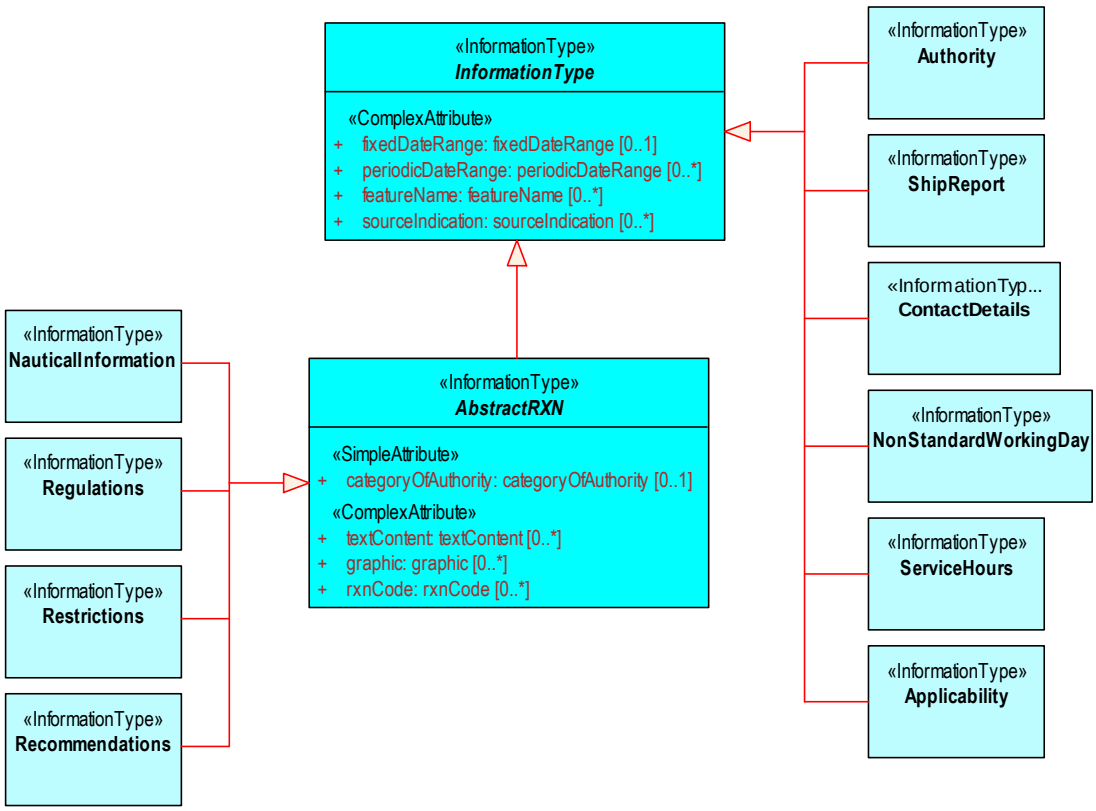

Figure 3 InfoTypesAbbreviated

Diagram Notes:

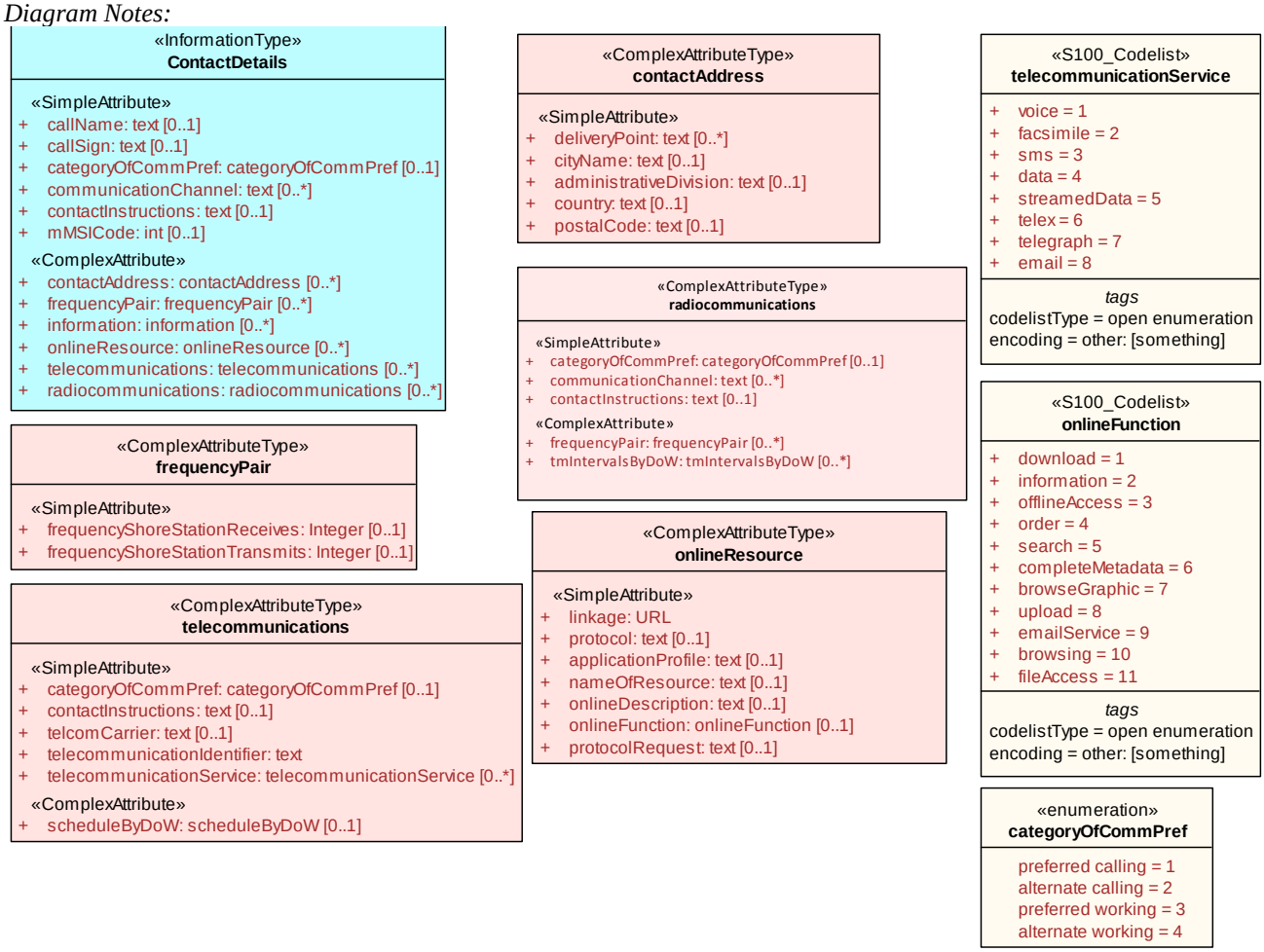

Figure 4 ContactDetails

Diagram Notes:

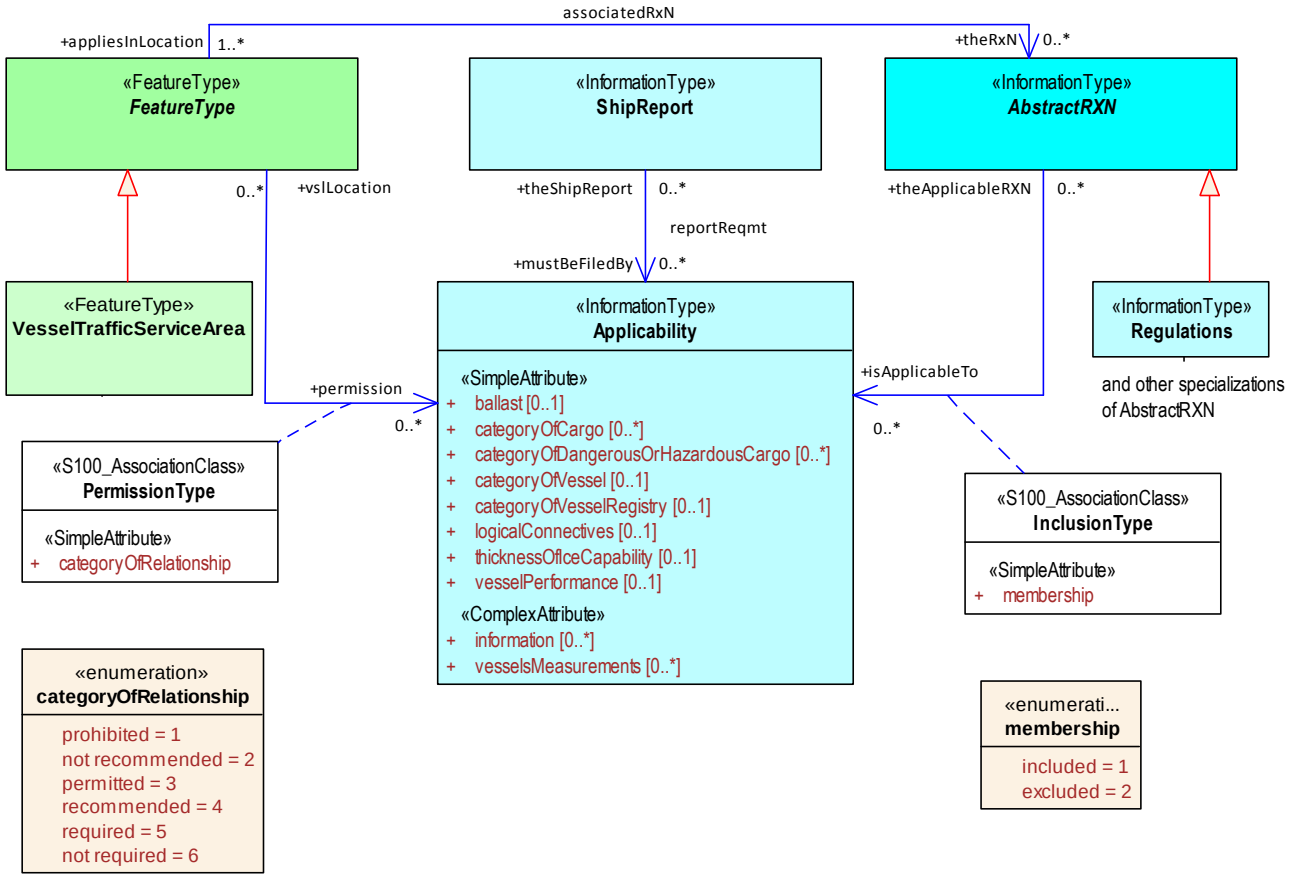

Figure 5 ApplicabilityAssociations

Diagram Notes:

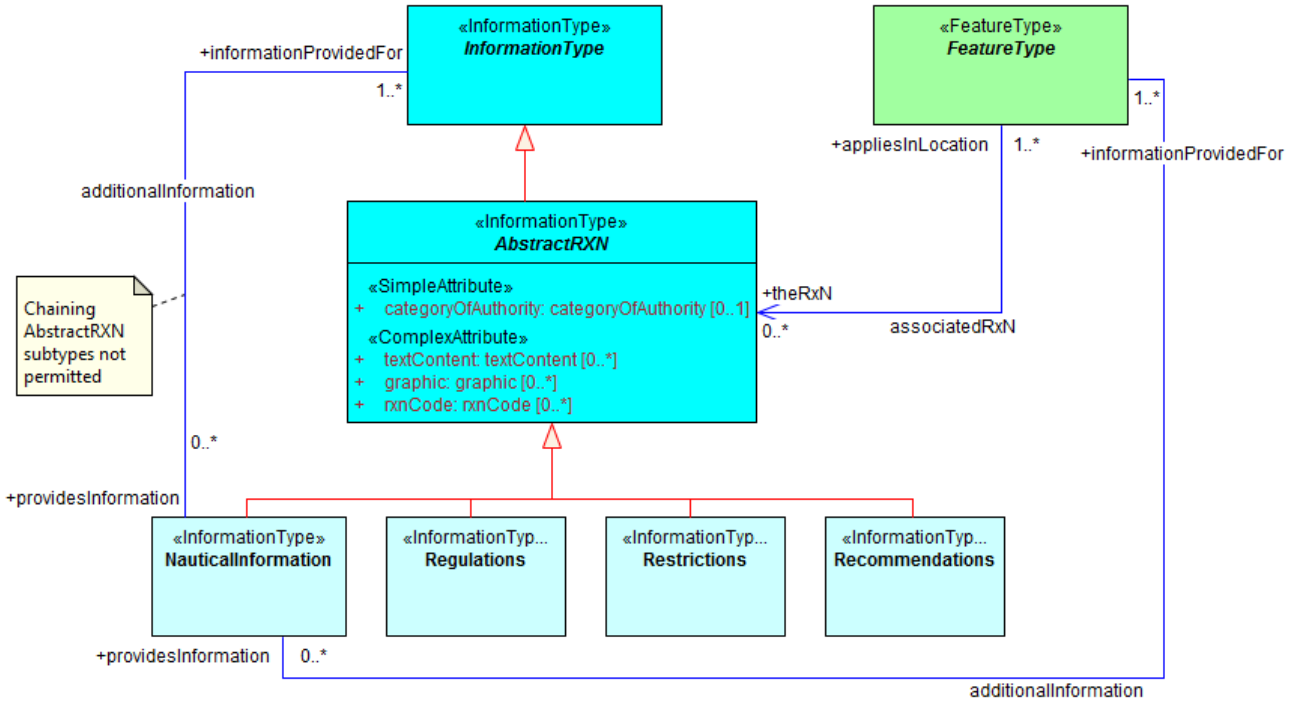

Figure 6 SupplementaryInformation

Diagram Notes:

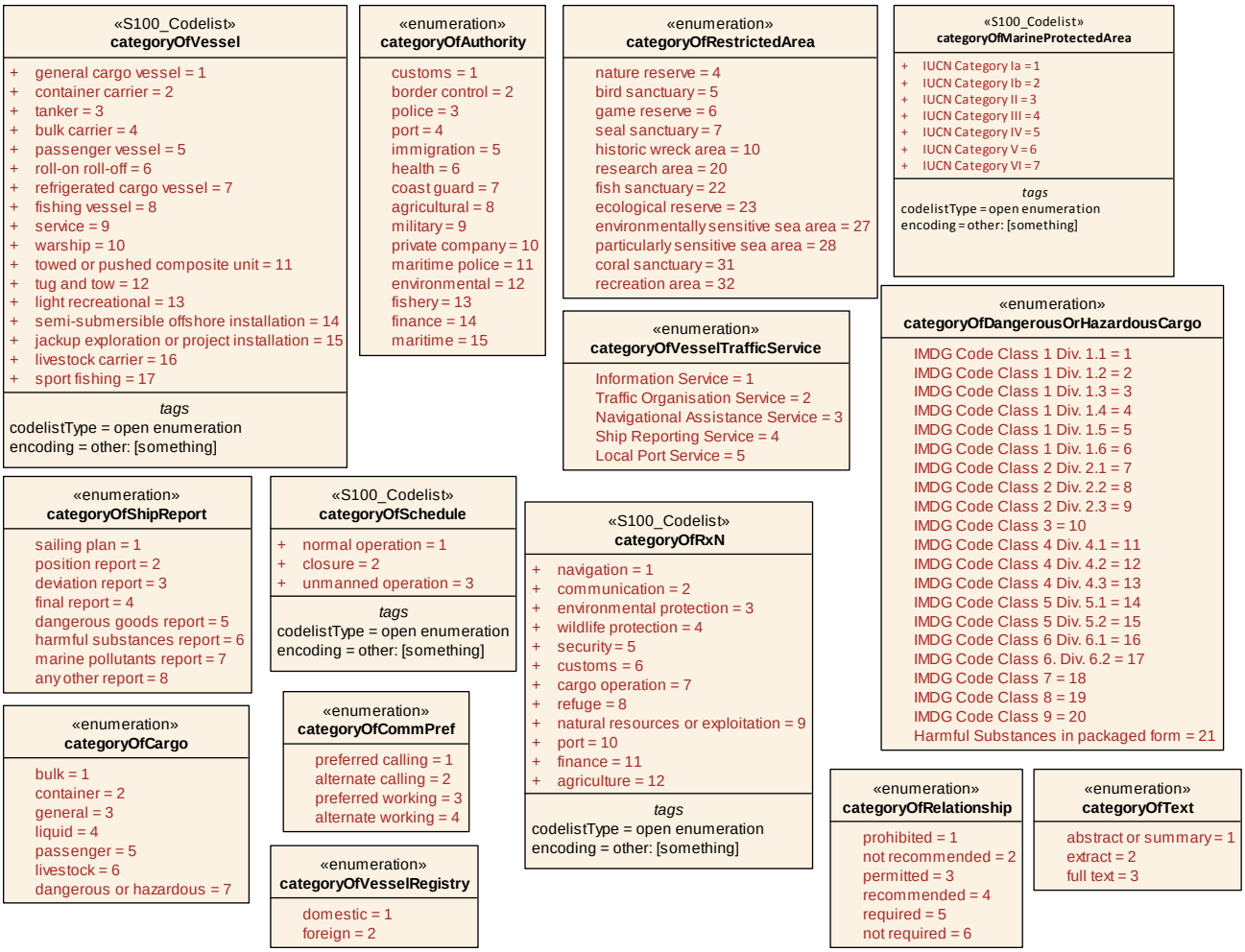

Figure 7 MPACategoryEnumsAndCodelists

Diagram Notes: A convenience diagram showing the significant listed values and codelists of feature and information types. Not included are listed values for association classes, text content or source description, or Applicability (they are in other diagrams).

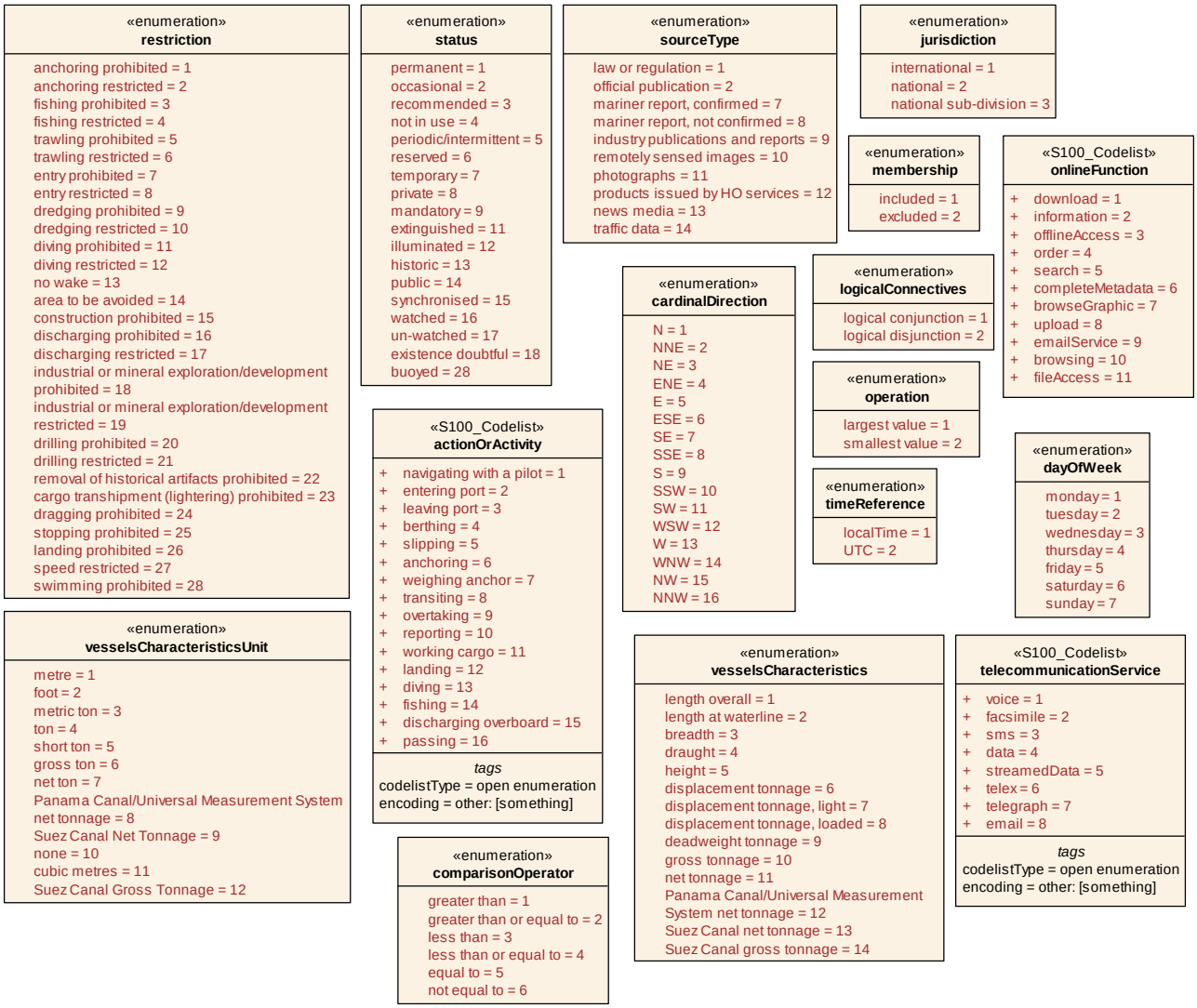

Figure 8 MPAOtherEnumsAndCodelists

Diagram Notes: A convenience diagram showing the significant listed values and codelists of feature and information types. Not included are listed values for association classes, text content or source description, or Applicability (they are in other diagrams).

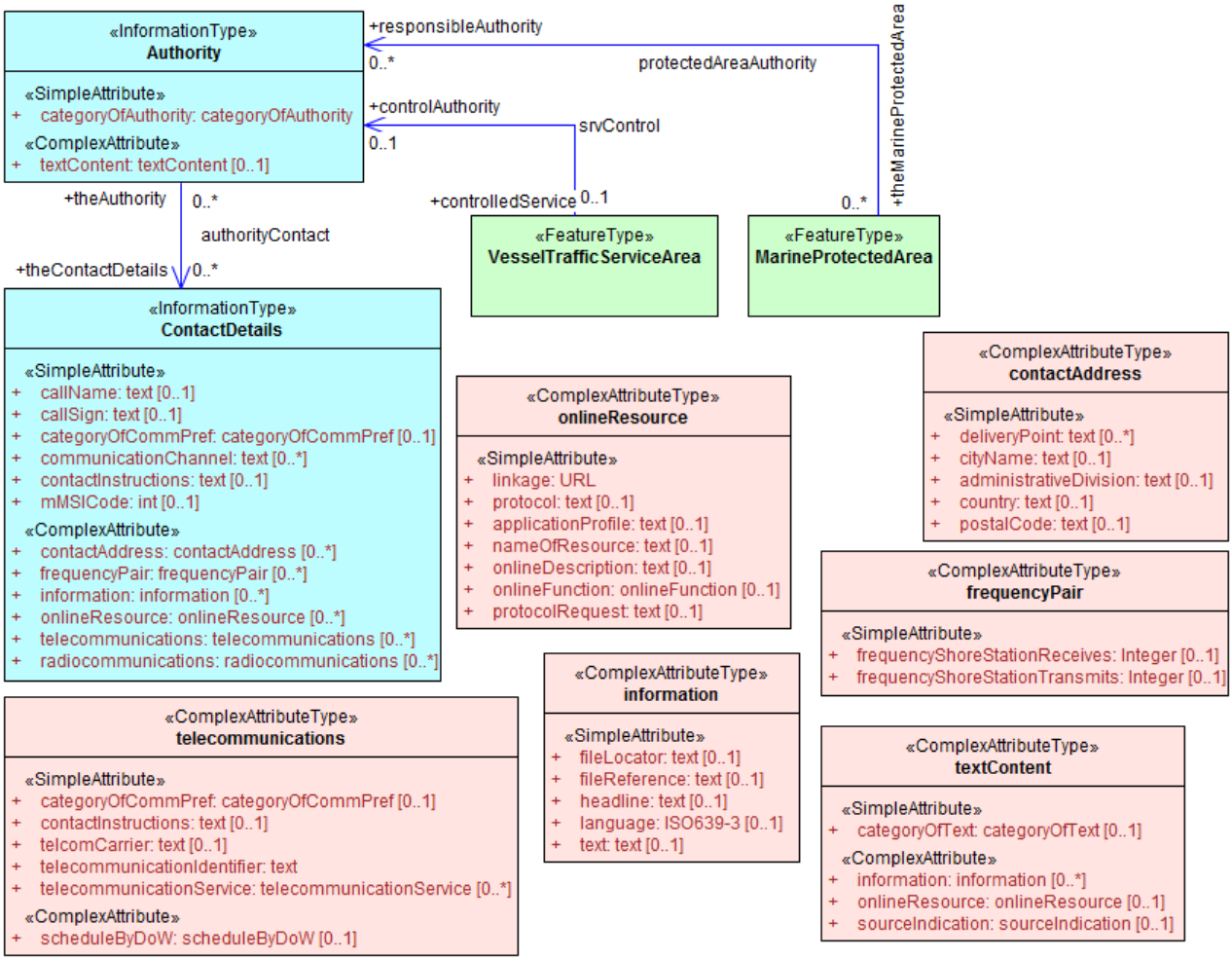

Figure 9 MPAAuthoritiesAndContacts

Diagram Notes:

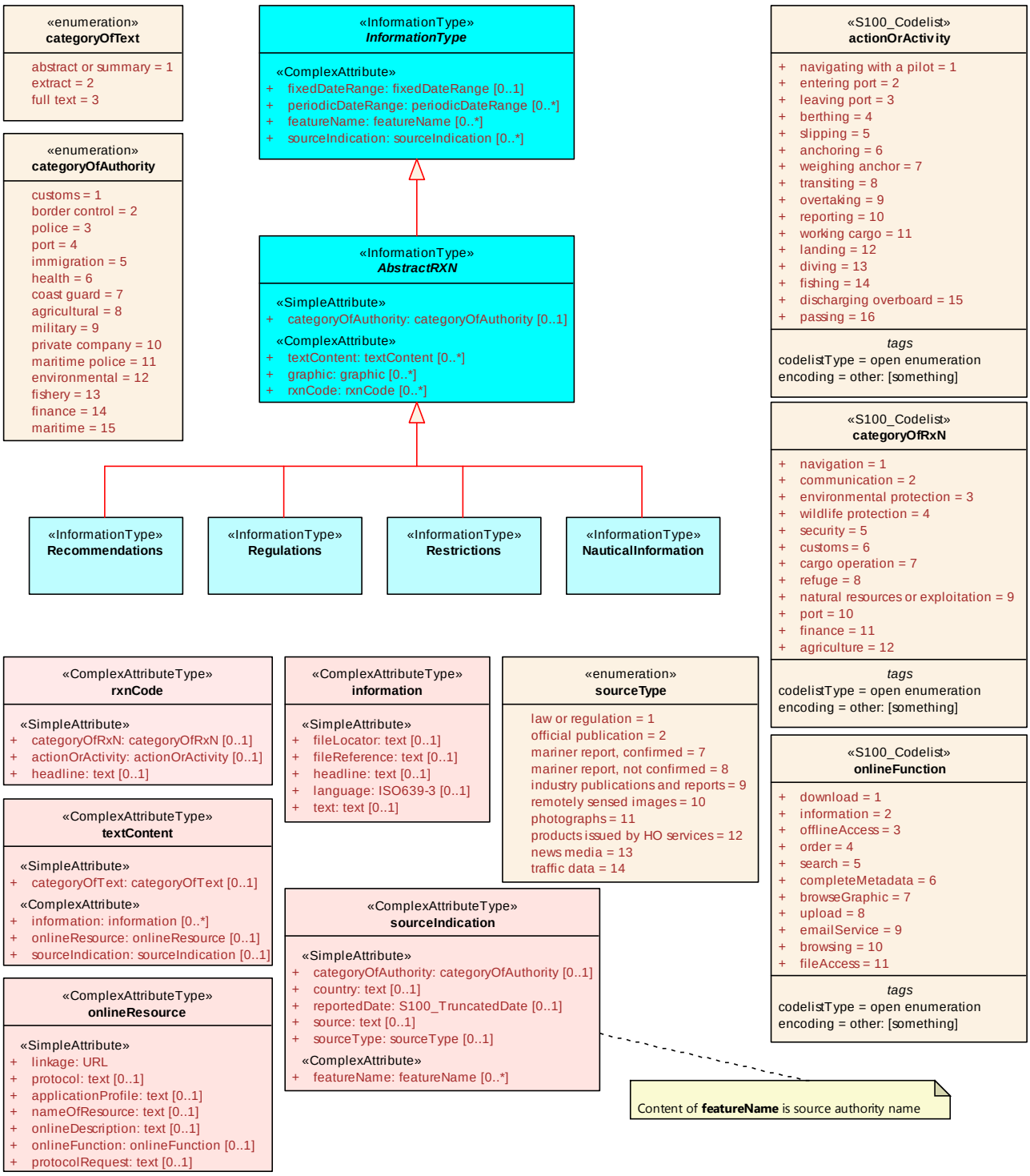

Figure 10 RXNTypes

Diagram Notes:

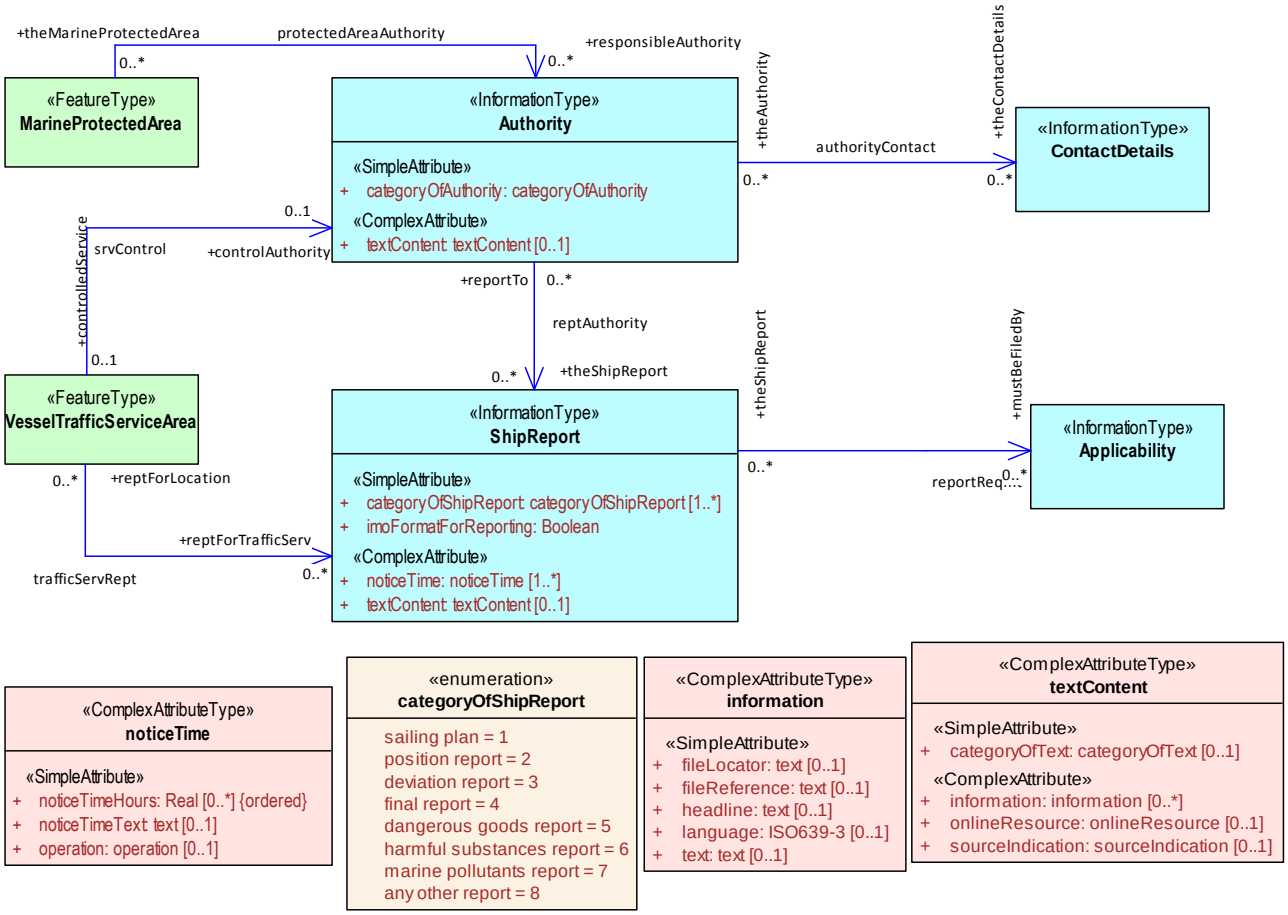

Figure 11 Reporting

Diagram Notes:

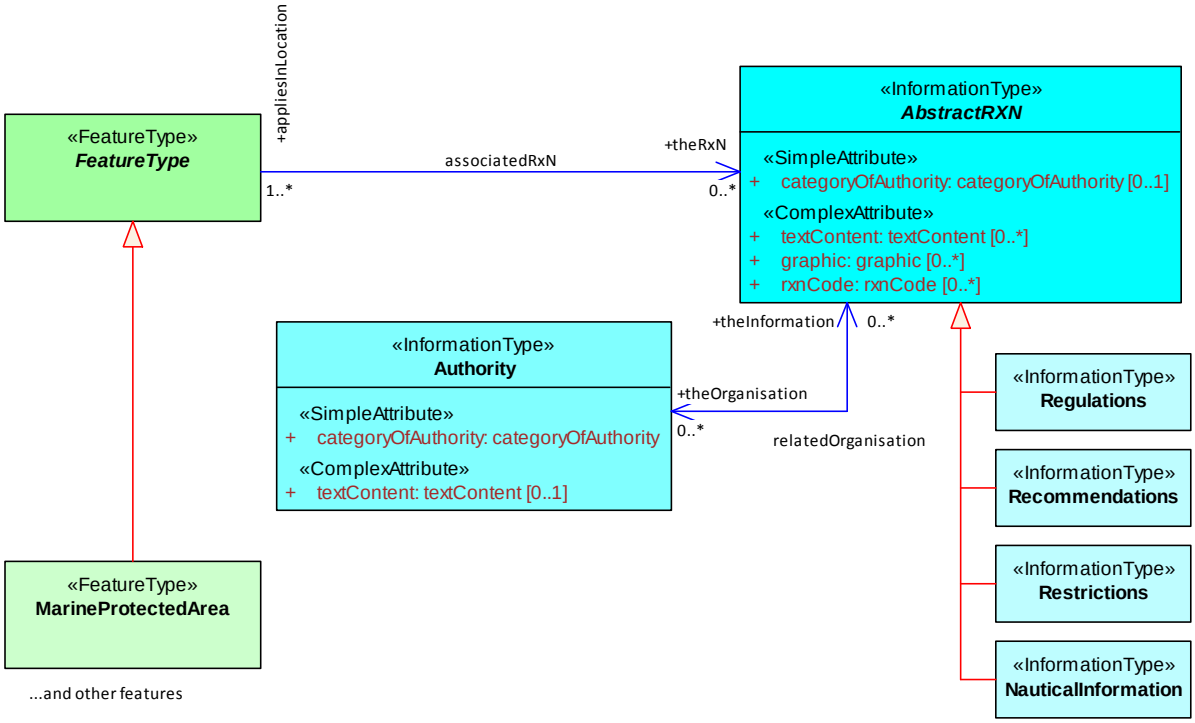

Figure 12 RulesForFeatures

Diagram Notes:

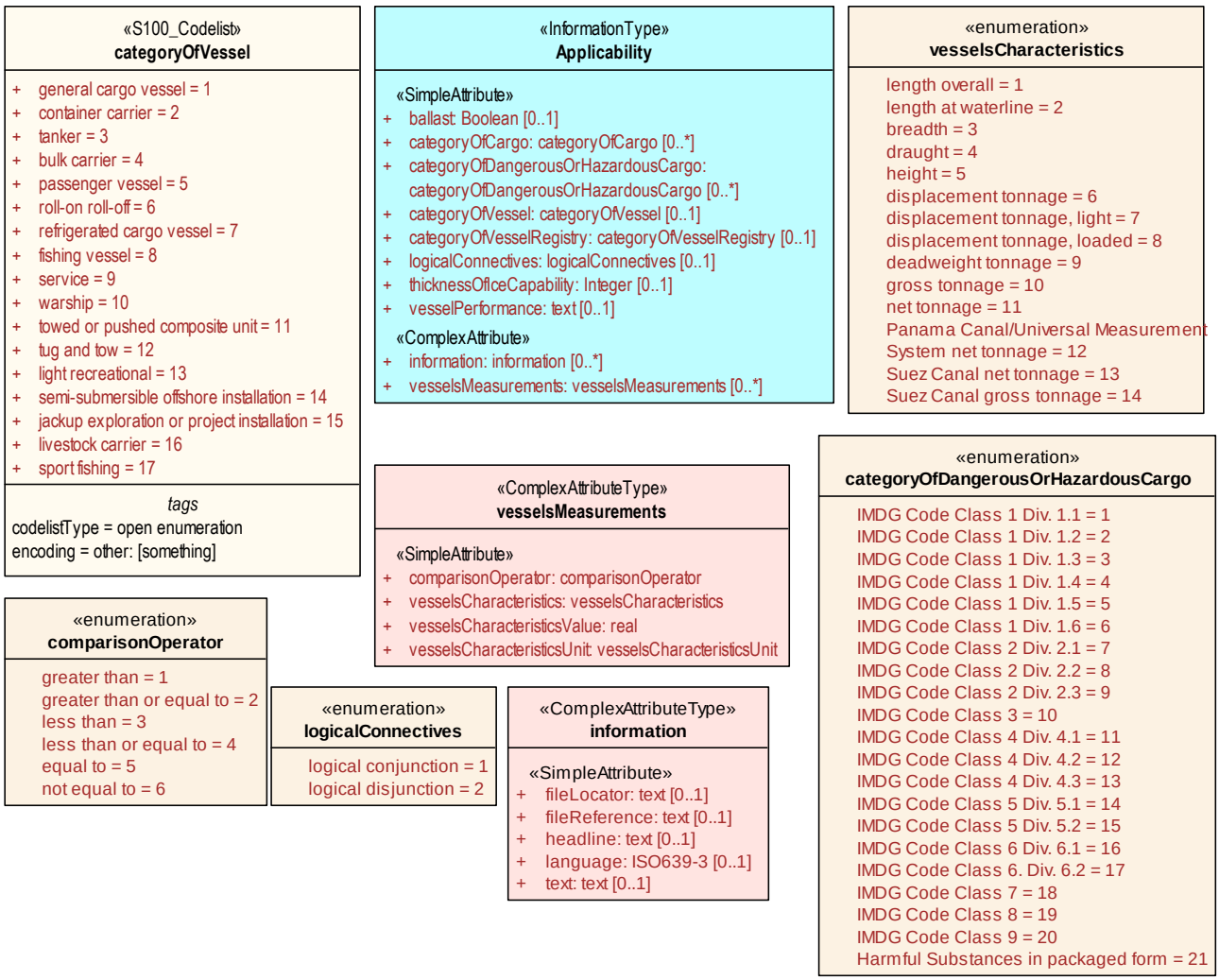

Figure 13 ShipCharacteristicSubsets

Diagram Notes:

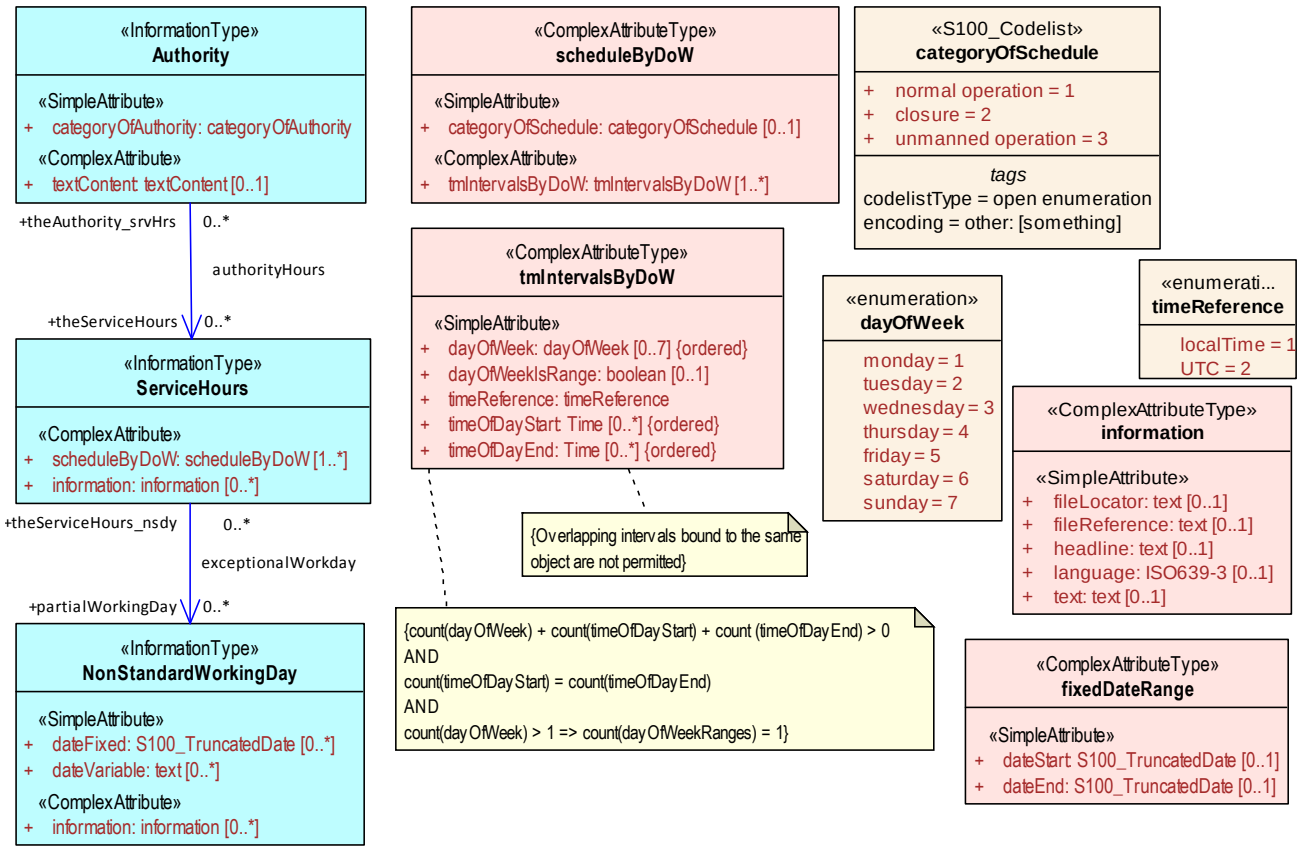

Figure 14 WorkingTimes

Diagram Notes:

1.1 Abstract Types

1.1.1 AbstractRXN

Information Type **Super-type: InformationType**

An abstract superclass for information types that encode rules, recommendations, and general information in text or graphic form.
Remark: Subtypes of AbstractRxN carry the same attributes, but differ in the nature of information they encode. There are currently four such subtypes: Regulations, Restrictions, Recommendations, and NauticalInformation.

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	

1.1.2 InformationType

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	
additionalInformation *Association*	*Label:* InformationType *Role:* informationProvidedFor *Multiplicity:* 1..* Ordered: 0	*Label:* NauticalInformation *Role:* providesInformation *Multiplicity:* 0..* Ordered: 0	

1.1.3 FeatureType

Geographic Feature **Super-type:**

Generalized feature type which carry all the common attributes

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*
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	
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	

1.2 Feature Types

1.2.1 MarineProtectedArea

Geographic Feature **Super-type: FeatureType**

Marine Protected Area: Any area of the intertidal or sub tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment. (IUCN – The World Conservation Union. 1998. Resolution 17.38 of the 17th General Assembly of the IUCN. Gland, Switzerland and Cambridge, UK.)

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	categoryOfMarineProtectedArea	[1]	categoryOfMarineProtectedArea	
Attribute	categoryOfRestrictedArea	[0..*]	categoryOfRestrictedArea	
Attribute	jurisdiction	[1]	jurisdiction	
Attribute	restriction	[0..*]	restriction	
Attribute	status	[0..*]	status	
Spatial Attribute	geometry	[0..*]	CurveOrSurface	

Inherited Attributes

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Complex Attribute	featureName	[0..*]	featureName	

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
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*
protectedAreaAuthority *Association*	*Label:* MarineProtectedArea *Role:* theMarineProtectedArea *Multiplicity:* 0..* Ordered: 0	*Label:* Authority *Role:* responsibleAuthority *Multiplicity:* 0..* Ordered: 0	

1.2.2 RestrictedAreaNavigational

Geographic Feature **Super-type: FeatureType**

A specified area of land or water designated by an appropriate authority within which access or navigation is restricted in accordance with certain specified conditions.
A navigational restricted area is an area where the restrictions have a direct impact on the navigation of a vessel in the area.

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	categoryOfRestrictedArea	[0..*]	categoryOfRestrictedArea	
Attribute	restriction	[1..*]	restriction	
Attribute	status	[0..*]	status	
Spatial Attribute	geometry	[0..*]	GM_OrientableSurface	

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

1.2.3 RestrictedAreaRegulatory

Geographic Feature **Super-type: FeatureType**

A specified area of land or water designated by an appropriate authority within which access or navigation is restricted in accordance with certain specified conditions.
A regulatory restricted area is an area where the restrictions have no direct impact on the navigation of a vessel in the area, but impact on the activities that can take place within the area.

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*

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Attribute	categoryOfRestrictedArea	[0..*]	categoryOfRestrictedArea	
Attribute	restriction	[0..*]	restriction	
Attribute	status	[0..*]	status	
Spatial Attribute	geometry	[0..*]	GM_OrientableSurface	

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

1.2.4 VesselTrafficServiceArea

Geographic Feature **Super-type: FeatureType**

The area of any service implemented by a relevant authority primarily designed to improve safety and efficiency of traffic flow and the protection of the environment. It may range from simple information messages, to extensive organisation of the traffic involving national or regional schemes.

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	categoryOfVesselTrafficService	[1]	categoryOfVesselTrafficService	
Spatial Attribute	geometry	[0..*]	GM_OrientableSurface	

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*
trafficServRept *Association*	*Label:* VesselTrafficServiceArea *Role:* reptForLocation *Multiplicity:* 0..* Ordered: 0	*Label:* ShipReport *Role:* reptForTrafficServ *Multiplicity:* 0..* Ordered: 0	
srvControl *Association*	*Label:* VesselTrafficServiceArea *Role:* controlledService *Multiplicity:* 0..1 Ordered: 0	*Label:* Authority *Role:* controlAuthority *Multiplicity:* 0..1 Ordered: 0	

1.3 Information Types

1.3.1 Applicability

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..*	*Label:* Applicability *Role:* isApplicableTo *Multiplicity:* 0..*	

Association name	*Source*	*Target*	*Notes*
	Ordered: 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	

1.3.2 Authority

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*
relatedOrganisation *Association*	*Label:* Authority *Role:* theOrganisation *Multiplicity:* 0..* Ordered: 0	*Label:* AbstractRXN *Role:* theInformation *Multiplicity:* 0..* Ordered: 0	
authorityHours *Association*	*Label:* Authority *Role:* theAuthority_srvHrs *Multiplicity:* 0..* Ordered: 0	*Label:* ServiceHours *Role:* theServiceHours *Multiplicity:* 0..* Ordered: 0	
authorityContact *Association*	*Label:* Authority *Role:* theAuthority *Multiplicity:* 0..* Ordered: 0	*Label:* ContactDetails *Role:* theContactDetails *Multiplicity:* 0..* Ordered: 0	
reptAuthority *Association*	*Label:* Authority *Role:* reportTo *Multiplicity:* 0..* Ordered: 0	*Label:* ShipReport *Role:* theShipReport *Multiplicity:* 0..* Ordered: 0	
protectedAreaAuthority *Association*	*Label:* MarineProtectedArea *Role:* theMarineProtectedArea *Multiplicity:* 0..* Ordered: 0	*Label:* Authority *Role:* responsibleAuthority *Multiplicity:* 0..* Ordered: 0	

Association name	*Source*	*Target*	*Notes*
srvControl *Association*	*Label:* VesselTrafficServiceArea *Role:* controlledService *Multiplicity:* 0..1 Ordered: 0	*Label:* Authority *Role:* controlAuthority *Multiplicity:* 0..1 Ordered: 0	

1.3.3 ContactDetails

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	categoryOfCommPref	[0..1]	categoryOfCommPref	
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

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Complex Attribute	radiocommunications	[0..*]	radiocommunications	

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*
authorityContact *Association*	*Label:* Authority *Role:* theAuthority *Multiplicity:* 0..* Ordered: 0	*Label:* ContactDetails *Role:* theContactDetails *Multiplicity:* 0..* Ordered: 0	

1.3.4 NauticalInformation

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:* FeatureType *Role:* informationProvidedFor *Multiplicity:* 1..* Ordered: 0	*Label:* NauticalInformation *Role:* providesInformation *Multiplicity:* 0..* Ordered: 0	
additionalInformation *Association*	*Label:* InformationType *Role:* informationProvidedFor *Multiplicity:* 1..* Ordered: 0	*Label:* NauticalInformation *Role:* providesInformation *Multiplicity:* 0..* Ordered: 0	

1.3.5 NonStandardWorkingDay

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	

1.3.6 Recommendations

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

1.3.7 Regulations

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

1.3.8 Restrictions

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

1.3.9 ServiceHours

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	

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
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	
authorityHours *Association*	*Label:* Authority *Role:* theAuthority_srvHrs *Multiplicity:* 0..* Ordered: 0	*Label:* ServiceHours *Role:* theServiceHours *Multiplicity:* 0..* Ordered: 0	

1.3.10 ShipReport

Information Type **Super-type: InformationType**

This describes how a ship should report to a maritime authority, including when to report, what to report and whether the format conforms to the IMO standard.

Attributes

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Attribute	categoryOfShipReport	[1..*]	categoryOfShipReport	
Attribute	imoFormatForReporting	[1]	Boolean	Whether a report must be in an IMO standard format
Complex Attribute	noticeTime	[1..*]	noticeTime	
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*
reportReqmt *Association*	*Label:* ShipReport *Role:* theShipReport *Multiplicity:* 0..* Ordered: 0	*Label:* Applicability *Role:* mustBeFiledBy *Multiplicity:* 0..* Ordered: 0	
trafficServRept *Association*	*Label:* VesselTrafficServiceArea	*Label:* ShipReport *Role:* reptForTrafficServ	

Association name	*Source*	*Target*	*Notes*
	Role: reptForLocation *Multiplicity:* 0..* Ordered: 0	*Multiplicity:* 0..* Ordered: 0	
reptAuthority *Association*	*Label:* Authority *Role:* reportTo *Multiplicity:* 0..* Ordered: 0	*Label:* ShipReport *Role:* theShipReport *Multiplicity:* 0..* Ordered: 0	

1.4 Association Classes

1.4.1 InclusionType

Association Class **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

1.4.2 PermissionType

Association Class **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

1.5 Complex Attributes

1.5.1 bearingInformation

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	

1.5.2 contactAddress

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.

1.5.3 featureName

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.

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
				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.

1.5.4 fixedDateRange

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.

1.5.5 frequencyPair

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

1.5.6 graphic

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	

1.5.7 information

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:

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / 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 attribute should 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.

1.5.8 noticeTime

Complex Attribute **Super-type:**

Attributes

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Attribute	noticeTimeHours	[0..*]	Real	
Attribute	noticeTimeText	[0..1]	text	
Attribute	operation	[0..1]	operation	

1.5.9 onlineResource

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.)

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
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)

1.5.10 orientation

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	

1.5.11 periodicDateRange

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.

1.5.12 radiocommunications

Complex Attribute **Super-type:**

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

Attributes

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Attribute	categoryOfCommPref	[0..1]	categoryOfCommPref	
Attribute	communicationChannel	[0..*]	text	
Attribute	contactInstructions	[0..1]	text	supplemental instructions on how or when to contact the individual, organisation, or service
Complex Attribute	frequencyPair	[0..*]	frequencyPair	
Complex Attribute	tmIntervalsByDoW	[0..*]	tmIntervalsByDoW	

1.5.13 rxnCode

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

1.5.14 scheduleByDoW

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	

1.5.15 sourceIndication

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

1.5.16 telecommunications

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	categoryOfCommPref	[0..1]	categoryOfCommPref	
Attribute	contactInstructions	[0..1]	text	instructions on how and when to contact an individual or organisation
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
Complex Attribute	scheduleByDoW	[0..1]	scheduleByDoW	

1.5.17 textContent

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

1.5.18 tmIntervalsByDoW

Complex Attribute **Super-type:**

Proposed definition, constraints and remarks:
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 attribute encodes 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 attribute to 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.

1.5.19 vesselsMeasurements

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	

1.6 Codelists

1.6.1 actionOrActivity

S100_Codelist

Notes: 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.

1.6.2 categoryOfMarineProtectedArea

S100_Codelist

Notes: Classification of marine protected areas based on IUCN (International Union for Conservation of Nature and Natural Resources) or another system

Listed Values

Role Name	*Name*	*Code*	*Description / Remarks*
Literal	IUCN Category Ia	1	Strict Nature Reserve: protected area managed mainly for science Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring. (International Union for Conservation of Nature and Natural Resources publication “Guidelines for Protected Area Management Categories”, IUCN, 1994)
Literal	IUCN Category Ib	2	Wilderness Area: protected area managed mainly for wilderness protection Large area of unmodified or slightly modified land, and/or sea retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition. (International Union for Conservation of Nature and Natural Resources publication “Guidelines for Protected Area Management Categories”, IUCN, 1994)
Literal	IUCN Category II	3	National Park: protected area managed mainly for ecosystem protection and recreation

Role Name	*Name*	*Code*	*Description / Remarks*
			Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. (International Union for Conservation of Nature and Natural Resources publication "Guidelines for Protected Area Management Categories", IUCN, 1994)
Literal	IUCN Category III	4	Natural Monument: protected area managed mainly for conservation of specific natural features Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance. (International Union for Conservation of Nature and Natural Resources publication "Guidelines for Protected Area Management Categories", IUCN, 1994)
Literal	IUCN Category IV	5	Habitat/Species Management Area: protected area managed mainly for conservation through management intervention Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species. (International Union for Conservation of Nature and Natural Resources publication "Guidelines for Protected Area Management Categories", IUCN, 1994)
Literal	IUCN Category V	6	Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area. (International Union for Conservation of Nature and Natural Resources publication "Guidelines for Protected Area Management Categories", IUCN, 1994)
Literal	IUCN Category VI	7	Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs. (International Union for Conservation of Nature and Natural Resources publication "Guidelines for Protected Area Management Categories", IUCN, 1994)

1.6.3 categoryOfRxN

S100_Codelist

Notes: 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

Role Name	*Name*	*Code*	*Description / Remarks*
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

1.6.4 categoryOfSchedule

S100_Codelist

Notes: 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.

1.6.5 categoryOfVessel

S100_Codelist

Notes: 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.

1.6.6 onlineFunction

S100_Codelist

Notes: 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).

1.6.7 telecommunicationService

S100_Codelist

Notes: Classification of methods of communication over a distance by electrical 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.

1.7 Enumerations

1.7.1 cardinalDirection

Enumeration

Notes: 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

1.7.2 categoryOfAuthority

Enumeration

Notes: 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.

Role Name	*Name*	*Code*	*Description / Remarks*
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.

1.7.3 categoryOfCargo

Enumeration

Notes: The different types of cargo that a ship may be carrying
proposed revision: 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

1.7.4 categoryOfDangerousOrHazardousCargo

Enumeration

Notes: 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	IMDG Code Class 1 Div. 1.1	1	Explosives, Division 1: substances and articles which have a mass explosion hazard
Literal	IMDG Code Class 1 Div. 1.2	2	Explosives, Division 2: substances and articles which have a projection hazard but not a mass explosion hazard
Literal	IMDG Code Class 1 Div. 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	IMDG Code Class 1 Div. 1.4	4	Explosives, Division 4: substances and articles which present no significant hazard
Literal	IMDG Code Class 1 Div. 1.5	5	Explosives, Division 5: very insensitive substances which have a mass explosion hazard
Literal	IMDG Code Class 1 Div. 1.6	6	Explosives, Division 6: extremely insensitive articles which do not have a mass explosion hazard
Literal	IMDG Code Class 2 Div. 2.1	7	Gases, flammable gases
Literal	IMDG Code Class 2 Div. 2.2	8	Gases, non-flammable, non-toxic gases
Literal	IMDG Code Class 2 Div. 2.3	9	Gases, toxic gases
Literal	IMDG Code Class 3	10	flammable liquids
Literal	IMDG Code Class 4 Div. 4.1	11	flammable solids, self-reactive substances and desensitized explosives
Literal	IMDG Code Class 4 Div. 4.2	12	substances liable to spontaneous combustion
Literal	IMDG Code Class 4 Div. 4.3	13	substances which, in contact with water, emit flammable gases
Literal	IMDG Code Class 5 Div. 5.1	14	oxidizing substances
Literal	IMDG Code Class 5 Div. 5.2	15	organic peroxides

Role Name	*Name*	*Code*	*Description / Remarks*
Literal	IMDG Code Class 6 Div. 6.1	16	toxic substances
Literal	IMDG Code Class 6. Div. 6.2	17	infectious substances
Literal	IMDG Code Class 7	18	Radioactive material
Literal	IMDG Code Class 8	19	Corrosive substances
Literal	IMDG Code 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)

1.7.5 categoryOfRelationship

Enumeration

Notes: 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

1.7.6 categoryOfRestrictedArea

Enumeration

Notes: The official legal status of each kind of restricted area defines the kind of restriction(s), e.g., the restriction for a 'game preserve' may be 'entering prohibited', the restriction for an 'anchoring prohibition area' is 'anchoring prohibited'.

Listed Values

Role Name	*Name*	*Code*	*Description / Remarks*
Literal	nature reserve	4	A tract of land or water managed so as to preserve it's flora, fauna, physical features, etc.
Literal	bird sanctuary	5	A place where birds are bred and protected.
Literal	game reserve	6	A place where wild animals or birds hunted for sport or food are kept undisturbed for private use.
Literal	seal sanctuary	7	A place where seals are protected.
Literal	historic wreck area	10	An area around certain wrecks of historical importance to protect the wrecks from unauthorized interference by diving, salvage or deposition (including anchoring).
Literal	research area	20	an area where marine research takes place.
Literal	fish sanctuary	22	A place where fish are protected.
Literal	ecological reserve	23	A tract of land or water managed so as to preserve the relation of plants and living creatures to each other and to their surroundings.
Literal	environmentally sensitive sea area	27	A generic term which may be used to describe a wide range of areas, considered sensitive for a variety of environmental reasons.
Literal	particularly sensitive sea area	28	An area that needs special protection through action by IMO because of its significance for regional ecological, socio-economic or scientific reasons and because it may be vulnerable to damage by international shipping activities.
Literal	coral sanctuary	31	A place where coral is protected. (TSMAD 29)
Literal	recreation area	32	An area within which recreational activities regularly take

Role Name	*Name*	*Code*	*Description / Remarks*
			place and therefore vessel movement may be restricted. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.76, November 2000).

1.7.7 categoryOfShipReport

Enumeration

Notes: Classification of ship reports based on IMO standard report formats.

Remarks: Through Resolution A.851(20), the IMO encourages authorities to require standard formats and procedures for ship reporting specified at ID 1 to 7 above but recognises that some authorities require amended formats and these cases are covered by ID 8 "any other report".
(Appendix to IMO Resolution A.851(20) GENERAL PRINCIPLES FOR SHIP REPORTING SYSTEMS AND SHIP REPORTING REQUIREMENTS, INCLUDING GUIDELINES FOR REPORTING INCIDENTS INVOLVING DANGEROUS GOODS, HARMFUL SUBSTANCES AND/OR MARINE POLLUTANTS.)

Listed Values

Role Name	*Name*	*Code*	*Description / Remarks*
Literal	sailing plan	1	before or as near as possible to the time of departure from a port within a system or when entering the area covered by a system [for instance A, B, J, X etc]
Literal	position report	2	when necessary to ensure effective operation of the system
Literal	deviation report	3	when the ship's position varies significantly from the position that would have been predicted from previous reports, when changing the reported route, or as decided by the master
Literal	final report	4	on arrival at the destination or on leaving the area covered by the system
Literal	dangerous goods report	5	when an incident takes place involving the loss or likely loss overboard of packaged dangerous goods, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges, into the sea
Literal	harmful substances report	6	when an incident takes place involving the discharge or probable discharge of oil (Annex I of MARPOL 73/78) or noxious liquid substances in bulk (Annex II of MARPOL 73/78)
Literal	marine pollutants report	7	in the case of the loss or likely loss overboard of harmful substances in packaged form, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges identified in the International Maritime Goods Code as marine pollutants (Annex III of MARPOL 73/78).
Literal	any other report	8	any other report should be made in accordance with the system procedures as notified in accordance with paragraph 9 of the general principles

1.7.8 categoryOfText

Enumeration

Notes: 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

1.7.9 categoryOfVesselTrafficService

Enumeration

Notes: Classification of vessel traffic services based on the nature of the control or services provided.

Listed Values

Role Name	*Name*	*Code*	*Description / Remarks*
Literal	Information Service	1	A service to ensure that essential information becomes available in time for on-board navigational decision-making (Source: IMO Resolution A.857(20))
Literal	Traffic Organisation Service	2	A service to assist on-board navigational decision-making and to monitor its effects (Source: IMO Resolution A.857(20))
Literal	Navigational Assistance Service	3	A service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area (Source: IMO Resolution A.857(20))
Literal	Ship Reporting Service	4	A service established by a relevant authority consisting of one or more reporting points or lines at which ships are required to report their identity, course, speed and other data to the monitoring authority.
Literal	Local Port Service	5	A service established to provide port information without interaction between the customer and the service provider. This information could be inter alia berthing information, availability of port services, shipping schedules, meteorological and hydrological data.

1.7.10 categoryOfVesselRegistry

Enumeration

Notes: 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.

1.7.11 categoryOfCommPref

Enumeration

Notes: Classification of frequencies for 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

Role Name	Name	Code	Description / Remarks
			busy or is suffering from interference

1.7.12 comparisonOperator

Enumeration

Notes: 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)

1.7.13 dayOfWeek

Enumeration

Notes: 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)

1.7.14 jurisdiction

Enumeration

Notes: The jurisdiction applicable to an administrative area.

Listed Values

Role Name	Name	Code	Description / Remarks

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.

1.7.15 logicalConnectives

Enumeration

Notes: 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

1.7.16 membership

Enumeration

Notes: 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.

1.7.17 operation

Enumeration

Notes: Suggested 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

1.7.18 restriction

Enumeration

Notes: Definition required.
Remarks: The official legal statue of each kind of restricted area 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'.
The complete information about the restriction(s), actually held in handbooks or other publications, may be encoded by an associated instance of the information type **Supplementary Information** (see clause X.X) attribute *textual description*. A short explanation may be given by the use of the complex attribute *information*.

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

Role Name	*Name*	*Code*	*Description / Remarks*
			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.

1.7.19 sourceType

Enumeration

Notes: 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

1.7.20 status

Enumeration

Notes: 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

1.7.21 timeReference

Enumeration

Notes: 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

1.7.22 vesselsCharacteristics

Enumeration

Notes: 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

Role Name	*Name*	*Code*	*Description / Remarks*
			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)
Literal	Suez Canal gross tonnage	14	Suez Canal Gross Tonnage (SCGT) is derived with a number of modifications from the former net register tonnage of the Moorsom System and was established by the International

Role Name	*Name*	*Code*	*Description / Remarks*
			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.

1.7.23 vesselsCharacteristicsUnit

Enumeration

Notes: 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

Role Name	*Name*	*Code*	*Description / Remarks*
			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
Literal	Suez Canal Gross Tonnage	12	The Suez Canal Gross Tonnage (SCGT) 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.

2 S-122 Meta Features (package)

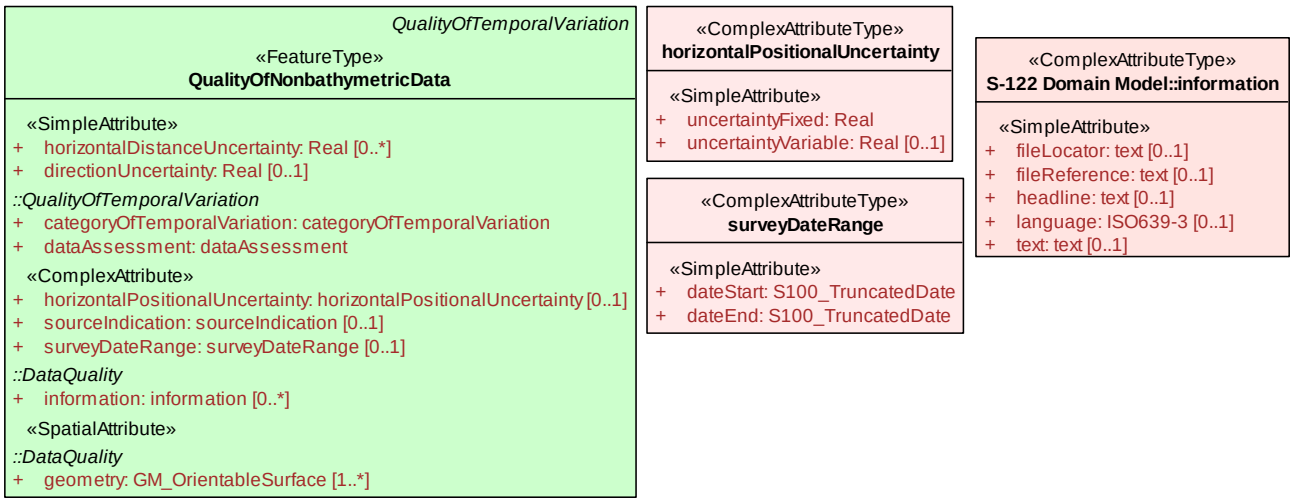

Figure 15 S-122 Q of NonBathy data

Diagram Notes:

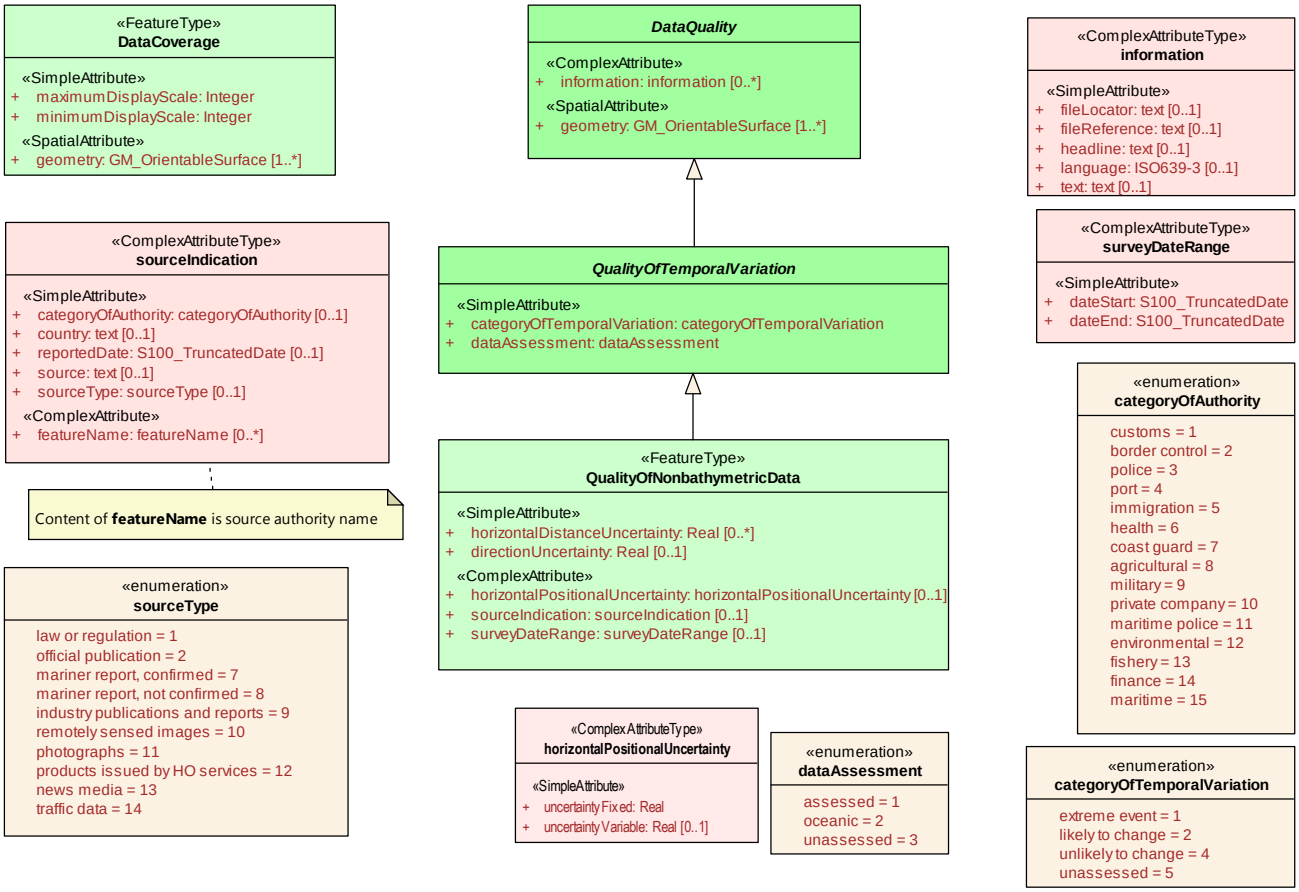

Figure 16 S-122 Meta Features

Diagram Notes: Classes for meta- feature types and complex attributes used by them.
Remarks:
The NPUBS model of meta-features extends the S-101 model by adding attributes for **information**, **source indication**, and **metaFeatureScope**. The latter describes the scope of applicability of meta-features quality of Bathymetric and non-bathymetric features.

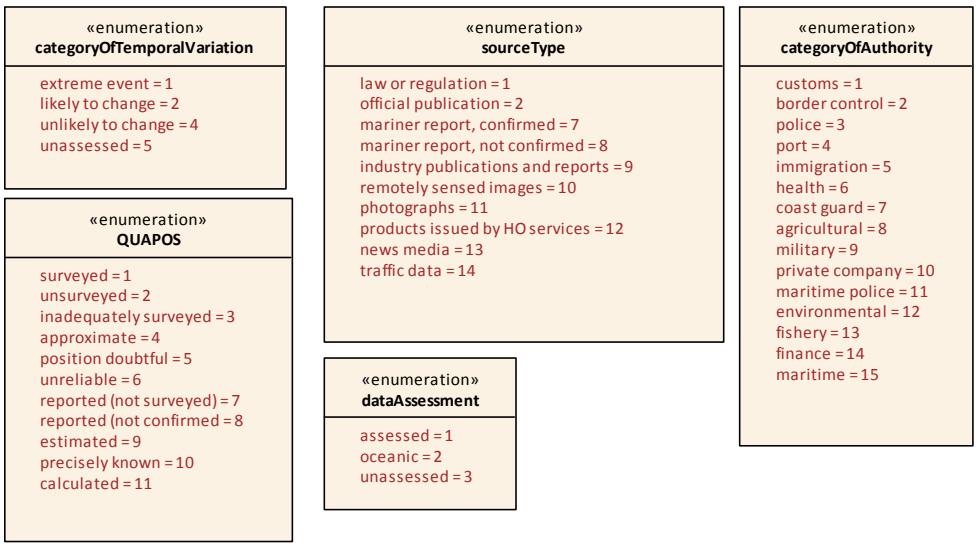

Figure 17 S-122 Meta FeatureEnums

Diagram Notes: Enumerations used by meta-features.

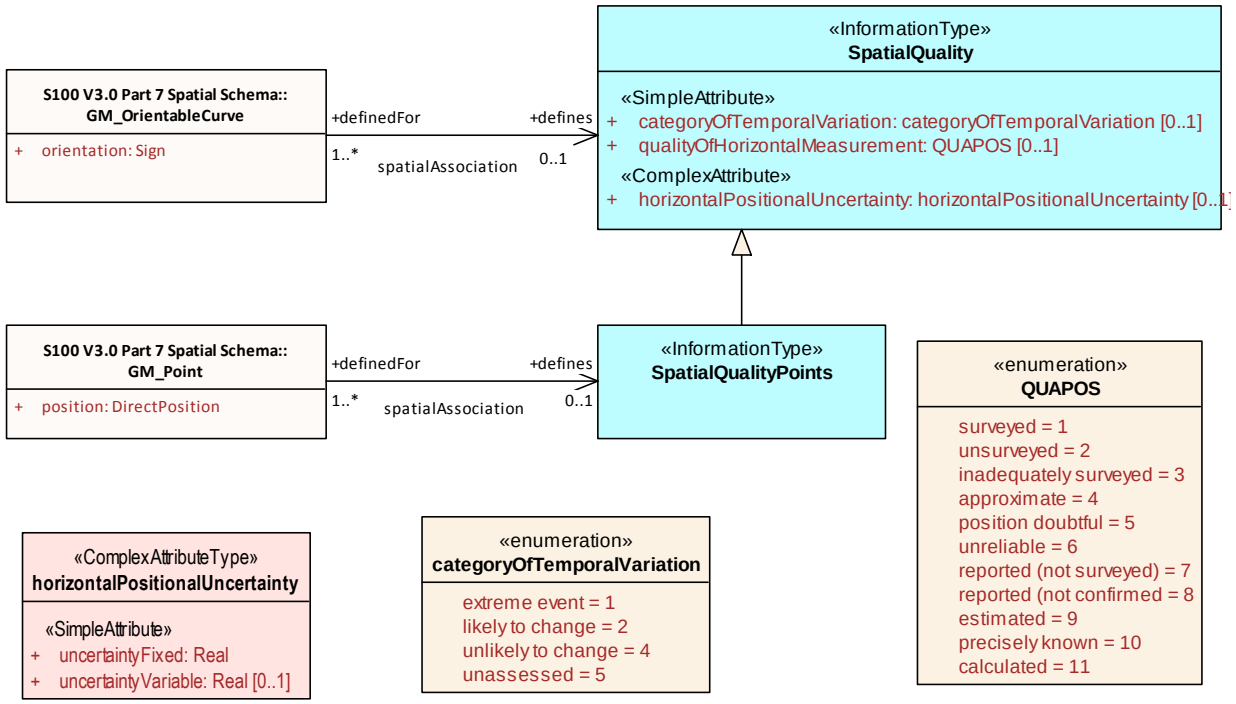

Figure 18 S-122 SpatialQuality

Diagram Notes: Application schema fragment describing the quality of location, depth, or height for an individual feature instance.

2.1 Features

2.1.1 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.

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Spatial Attribute	geometry	[1..*]	GM_OrientableSurface	Permitted spatial primitives

Inherited Attributes

Associations

2.1.2 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*
Spatial Attribute	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	

2.1.3 DataCoverage

Geographic Feature Super-type:

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

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
Attribute	minimumDisplayScale	[1]	Integer	minimumDisplayScale > maximumDisplayScale
Spatial Attribute	geometry	[1..*]	GM_OrientableSurface	Permitted spatial primitives

Inherited Attributes

Associations

2.1.4 QualityOfNonbathymetricData

Geographic Feature **Super-type: QualityOfTemporalVariation**

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

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.
Spatial Attribute	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

2.2 Information Types

2.2.1 SpatialQuality

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*
spatialAssociation *Association*	*Label:* GM_OrientableCurve *Role:* definedFor *Multiplicity:* 1..* Ordered: 0	*Label:* SpatialQuality *Role:* defines *Multiplicity:* 0..1 Ordered: 0	

2.2.2 SpatialQualityPoints

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	

2.3 Complex Attributes

2.3.1 horizontalPositionalUncertainty

Complex Attribute **Super-type:**

The best estimate of the accuracy of a position

Attributes

Role Name	*Name*	*Multiplicity*	*Data type*	*Description / Remarks*
Attribute	uncertaintyFixed	[1]	Real	The best estimate of the fixed vertical accuracy component for depths, heights, vertical distances and vertical clearances. Note: Definition may need to be updated if it is used for horizontal measurements.
Attribute	uncertaintyVariable	[0..1]	Real	The best estimate of the variable vertical accuracy component for depths, heights, vertical distances and vertical clearances. Note: Definition may need to be updated if it is used for horizontal measurements.

Inherited Attributes

Associations

2.3.2 surveyDateRange

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

2.4 Enumerations

2.4.1 dataAssessment

Enumeration

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.

2.4.2 QUAPOS

Enumeration

Definition required

Tag: CamelCaseID qualityOfHorizontalMeasurement

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.

Role Name	*Name*	*Code*	*Description / Remarks*
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.

2.4.3 categoryOfTemporalVariation

Enumeration

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	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

3 S-122 Cartographic Features (package)

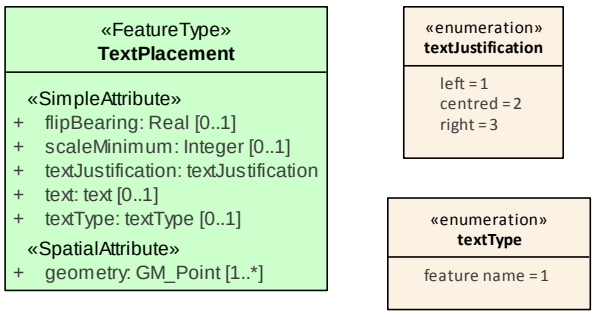

Figure 19 S-122 Cartographic Features

Diagram Notes:

3.1 Features

3.1.1 TextPlacement

Geographic 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.

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 attribute should 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	
Spatial Attribute	geometry	[1..*]	GM_Point	

Inherited Attributes

Associations

3.2 Enumerations

3.2.1 textJustification

Enumeration

Notes: 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.

Role Name	*Name*	*Code*	*Description / Remarks*
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.

3.2.2 textType

Enumeration

Notes: 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	The type of attribute that will be passed via the text string.