DISCUSSION DRAFT

Version 0.0.1 – August 2009

Special Publication No. 10?
??? Product Specification

Prepared for consideration by IHO SNPWG

Contents

1. Overview

1.1. Waterway Information Product Specification Metadata

Title:	SNPWG Waterway Information Product Specification
Version:	0.0.0
Date:	
Language:	English
Classification:	Unclassified
Contact:	SNPWG Chair, International Hydrographic Bureau
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URL:	www.iho-ohi.net
Identifier:	SNPWG PIPS
Maintenance:	Changes to this product specification are coordinated by the Standardization of Nautical Publications Working Group (SNPWG) of the IHO and shall be made available via the IHO web site.

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1.2. Terms, Definitions and Abbreviations

1.2.1. Terms and Definitions

The terms and definitions in S-100 V. 0.0.3 § 1-3 and Annex 1 apply to this document. The following additional terms are used:

Cardinality	The number of values of an attribute of an object.

1.2.2. Abbreviations

The abbreviations defined in S-100 V. 0.0.3 § 0-2 are used in this document. The following abbreviations are also used:

CPSCWG	Chart Standardisation and Paper Chart Working Group
DIPWG	Digital Information Portrayal Working Group
DQWG	Data Quality Working Group
ECDIS	Electronic Chart Display Information Systems
ENC	Electronic Navigation Charts

FCD	Feature Concept Dictionary
IMO	International Maritime Organization
SNPWG	Standardisation of Nautical Publications Working Group
SOLAS	Safety of Life at Sea
WI	Waterway Information

1.3. Informal Description

Title: Waterway Information

Abstract: Waterway Information (WI) is a product produced on the authority of a government authorized Hydrographic Office. Its primary function is for use within an Electronic Chart Display and Information System (ECDIS) to meet IMO and SOLAS requirements. The WI contains an extraction of real world information necessary to safely execute passage from a departure point to a given destination within the area of coverage.

Content: A conformant data set may contain features associated with the information on waterway. The specific content is defined by the WI Feature Catalogue and the WI Application Schema.

Spatial Extent:

Description: navigable waters
East Bounding Longitude: 180
West Bounding Longitude: -180
North Bounding Latitude: 90
South Bounding Latitude: -90

Specific Purpose: This document describes data collected for the purpose of providing WI. WI provides a summary of verbal structured information about restrictions, regulations and recommendations imposed by vessel characteristics, cargo as well as other location specific conditions. WI provides information about nautical information, restrictions, regulations and recommendations to the area.

2. Specification Scopes

NOTE: TSMAD in the discussion at last meeting discovered that it is not fully understood what is intended to be done with scope. So for this case, it will be a high-level explanation of the basic paradigms used.

Scope ID: Root scope
Level: 001
Level name: WI scope
Extent: Global, marine areas only

Scope ID: NonGeospatial Scope
Level: 002
Level name: NonGeospatial Scope
Extent: Global, areas where navigation is applicable

Scope ID: Geospatial Scope
Level: 002
Level name: Geospatial Scope
Extent: Global, areas where navigation is applicable

Scope ID: Scale Dependent
Level: 003
Level name: Scale Dependent Scope
Extent: Global, marine areas only

~~**Scope ID:** Scale Independent~~
~~**Level:** 003~~
~~**Level name:** Scale Independent Scope~~
~~**Extent:** Global, marine areas only~~

Note: for the following scope ID; Scale Dependent and Scale Independent see S-101 Electronic Navigational Chart Product Specification.

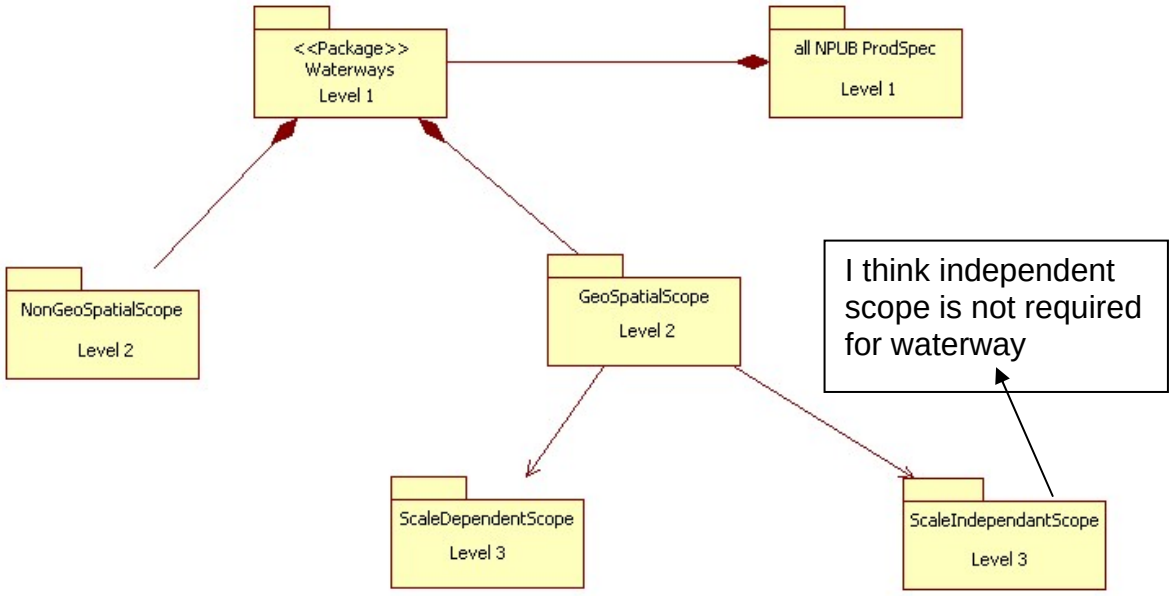

Figure 1. Specification scopes

This specification is about WI in particular. WI products make use of a geographical query function with ECDIS to identify which areas are navigable within given areas. These areas are covered by a WI area which provides the details about waterway.

3. Data Product Identification

A data set that conforms to this product specification will be identifiable by the discovery metadata that supports it.

Title:	Waterway Information
Alternative Title:	WI

Abstract:	When an S-10x WI is produced it must be in accordance with the rules defined in the WI product specification. S-10x details specifications intended to enable Hydrographic Offices to produce a consistent WI, and manufacturers to use that data efficiently in an ECDIS to satisfy IMO Performance Standards for ECDIS.
Topic Category:	Transportation
Geographic Description:	Areas where waterway information for marine navigation is applicable.
Spatial Resolution:	Display Scale
Purpose:	The data shall be collected for the purpose of displaying waterway information to a user.
Language:	English, with additional languages optional.
Classification:	Unclassified
Spatial Representation Type:	Vector
Point of Contact:	Producing Hydrographic Office
Use Limitations:	Not to be used without official ENC

4. Data Content and Structure

An S-10X (Waterway) product is feature based and has information objects heavily employed. This section contains the product application schema expressed in UML and an associated ~~feature~~ catalogue. The ~~feature~~ catalogue provides a full description of each object type including its attributes, attribute values and relationships in the data product.

Blue text in this section and Annexes A-C indicates changes or additions to the SNPWG or S-100/S-57 object model.

4.1. Application Schema

The UML diagrams for the application schema for this specification are given below. The feature catalogue is in Section 4.2 and Annexes A-C.

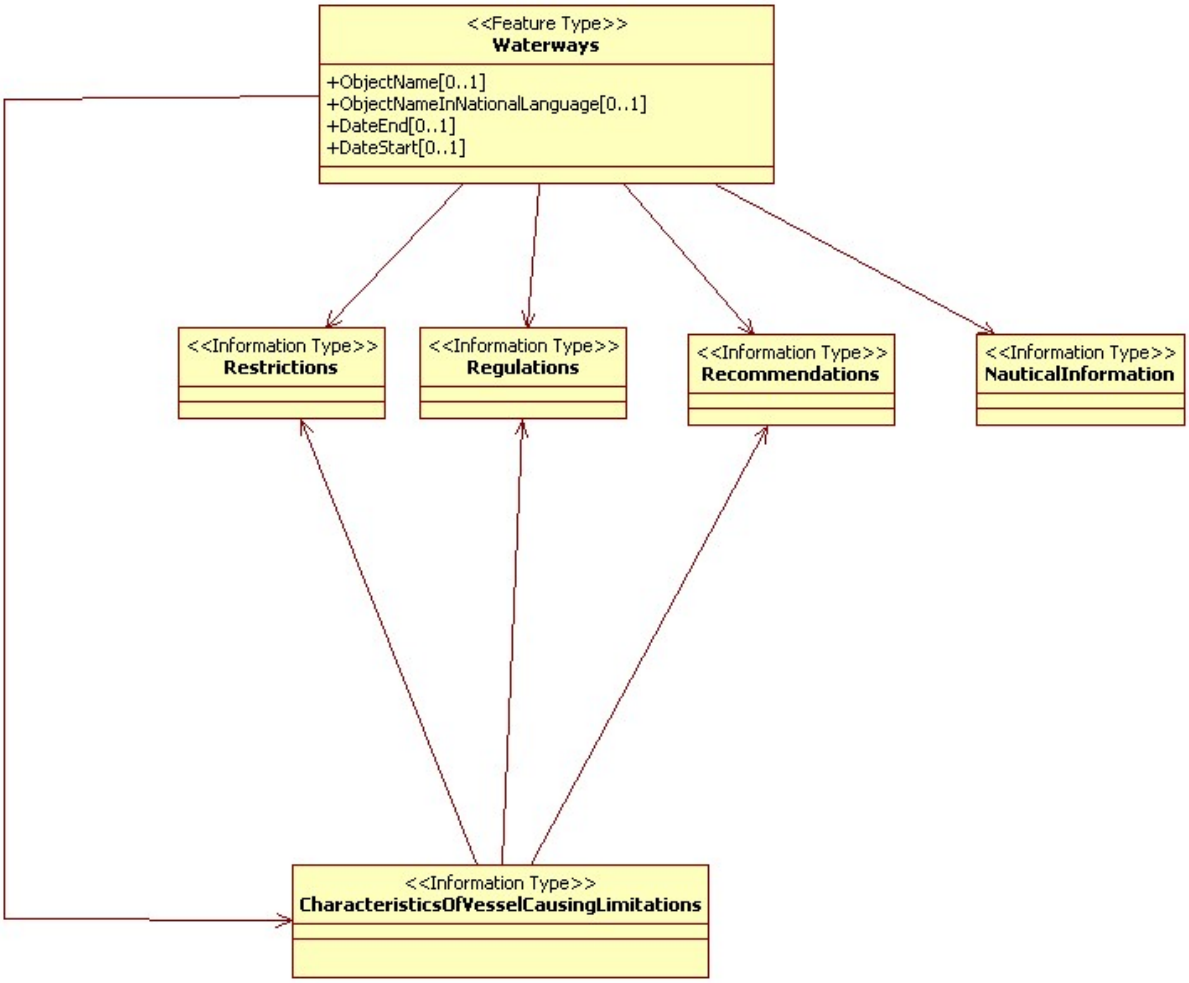

Figure 2 Waterway Application schema; Version 0.1

To be provided

Figure 3: Objects and attributes

To be provided

Figure 4: Enumerations

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	WaterwayArea	A line of water (river, channel, etc.) which can be utilized for communication or transport	-	-	
Attribute	objectName	The individual name of an object	0..1	text	
Attribute	objectNameInNationalLanguage	The individual name of an object in the national language	0..*	text	
Attribute	scaleMaximum	The maximum scale at which the object may be used e.g. for ECDIS presentation. The modulus of the scale is indicated, that is 1:25 000 is encoded as 25000.	0..1	integer	
Attribute	scaleMinimum	The minimum scale at which the object may be used e.g. for ECDIS presentation. The modulus of the scale is indicated, that is 1:25 000 is encoded as 25000.	0..1	integer	
Attribute	textualDescription	The file name of an external text file that contains the text	0..*	text	
Attribute	sourceDate	The production date of the source, e.g. the date of measurement.	0..1	date	
Attribute	sourceIndication	Information about the source of the object.	0..1	Coded Text	
Attribute	status	?	0..*	Integer	
Association	Regulations	Additional information is available	0..*	-	
Association	Restrictions	Additional information is available	0..*	-	
Association	Recommendations	Additional information is available	0..*	-	
Association	NauticalInformation	Additional information is available	0..*	-	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	CharacteristicsOfVesselsCausingLimitations	Characteristics of vessels (by construction, cargo or performance), which limit the passage of vessels, or the use by vessels, of an area or facility	-	-	
Attribute	ballast	?	0..1	boolean	
Attribute	categoryOfCargo	?	0..*	List	
Attribute	categoryOfVessel	?	0..*	List	
Attribute	dateEnd	The attribute “date end” indicates the latest date on which an object (e.g. a buoy) will be present.	0..1	date	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Attribute	dateStart	The attribute “date, start” indicates the earliest date on which an object (e.g. a buoy) will be present.	0..1	date	
Attribute	thicknessOfIceCapability	The thickness of ice that the ship can safely transit.	0..1	integer	
Attribute	limitationType	This attribute describes the interpretation of a “chalim” information object in the context of the object(s) with which it is associated.	0..1	LimitationType	
Attribute	maximumAirDraught	The maximum allowed height of the highest point of a vessel above the water-line.	0..1	real	
Attribute	maximumBreadth	The maximum allowed breadth (beam) of a vessel.	0..1	real	
Attribute	maximumDisplacementTonnage	The maximum allowed displacement tonnage of a vessel.	0..1	integer	
Attribute	maximumDraught	The maximum allowed vertical distance, at any section of a vessel from the surface of the water to the bottom of the keel.	0..1	real	
Attribute	maximumDeadweightTonnage	The maximum allowed deadweight tonnage of a vessel.	0..1	integer	
Attribute	maximumGrossTonnage	The maximum allowed gross tonnage of a vessel.	0..1	integer	
Attribute	maximumOverallLength	The maximum allowed overall length of a vessel	0..1	real	
Attribute	maximumNetTonnage	The maximum allowed net tonnage of a vessel.	0..1	integer	
Attribute	minimumDisplacementTonnage	The minimum allowed displacement tonnage of a vessel.	0..1	integer	
Attribute	minimumDeadweightTonnage	The minimum allowed deadweight tonnage of a vessel.	0..1	integer	
Attribute	minimumGrossTonnage	The minimum allowed gross tonnage of a vessel.	0..1	integer	
Attribute	minimumOverallLength	The minimum allowed overall length of a vessel.	0..1	real	
Attribute	minimumNetTonnage	The minimum allowed net tonnage of a vessel.	0..1	integer	
Attribute	objectName	The individual name of an object	0..*	text	
Attribute	periodicDateEnd	The end of the active period for a seasonal object (e.g. a buoy). See also “date end”.	0..1	date	
Attribute	periodicDateStart	The start of the active period for a seasonal object (e.g. a buoy). See also “date start”.	0..1	date	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Attribute	performance	A description of the required handling characteristics of a vessel including hull design, main and auxiliary machinery, cargo handling equipment, navigation equipment and manoeuvring behaviour.	0..1	text	
Attribute	informationMultilingual	Textual information about the object.	0..*	complex	
Attribute	sourceDate	The production date of the source, e.g. the date of measurement.	0..1	date	
Attribute	sourceIndication	Information about the source of the object.	0..1	Formatted text	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	Regulations	Regulations for a related area or facility.	-	-	
Attribute	categoryOfAuthority	?	1	CategoryOfAuthority	
Attribute	categoryOfRxN	The broad category or semantic group to which the information, regulation, restriction, or recommendation pertains. These broad categories may correspond to subdivision titles in sailing directions.	0..*	CategoryOfRxN	
Attribute	dateEnd	The attribute “date end” indicates the latest date on which an object (e.g. a buoy) will be present.	0..1	date	
Attribute	dateStart	The attribute “date, start” indicates the earliest date on which an object (e.g. a buoy) will be present.	0..1	date	
Attribute	objectName	The individual name of an object	0..*	text	
Attribute	periodicDateEnd	The end of the active period for a seasonal object (e.g. a buoy). See also “date end”.	0..1	date	
Attribute	periodicDateStart	The start of the active period for a seasonal object (e.g. a buoy). See also “date start”.	0..1	date	
Attribute	rxnCode	This attribute encodes the most common types of regulations (recommendations, restrictions).	0..*	RxNCode	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Attribute	informationMultilingual	Textual information about the object.	0..*	complex	
Attribute	scaleMaximum	The maximum scale at which the object may be used e.g. for ECDIS presentation. The modulus of the scale is indicated, that is 1:25 000 is encoded as 25000.	0..1	integer	
Attribute	scaleMinimum		0..1	integer	
Attribute	textualDescription	The file name of an external text file that contains the text	0..*	text	
Attribute	sourceDate	The production date of the source, e.g. the date of measurement.	0..1	date	
Attribute	sourceIndication	Information about the source of the object.	0..1	Formatted text	
Association	CharacteristicsOfVesselsCausingLimitations	Additional information is available	0..*	-	

Role Name	Name	Description	Remarks
Enumeration	CategoryOfAuthority	?	See feature catalogue
Literal	-	-	

Role Name	Name	Description	Remarks
Enumeration	CategoryOfCargo	?	See feature catalogue
Literal	-	-	

Role Name	Name	Description	Remarks
Enumeration	categoryOfDangerousOrHazardousCargo	?	See feature catalogue
Literal	-	-	

Role Name	Name	Description	Remarks
Enumeration	Status	?	See feature catalogue
Literal	-	-	

4.2. Feature Catalogue

Name: Waterway Information Feature Catalogue
Scope: Catalogue containing objects associated with waterway information.
Field of application: Marine navigation
Version Number: 0.0.1
Version Date: 17 August 2009
Producer: International Hydrographic Organisation

Check against what?

4.2.1. Summary of Types

Register Dict.	Index	Alpha code	Name	Version Date
NPUB	Information	CHALIM	Characteristics of Vessels Which Cause Limitations	2009-06-19
NPUB	Information	REGLTS	Regulations	2009-06-19
NPUB	Attribute	BALAST	Ballast	2009-06-19
NPUB	Attribute	CATAUT	Category of Authority	2009-06-19
NPUB	Attribute	CATCGO	Category of Cargo	2009-06-19
NPUB	Attribute	CATDHC	Category of dangerous or hazardous cargo or ballast	2009-06-19
NPUB	Attribute	CATRXN	Category of Regulation / Restriction / Recommendation	2009-06-19
NPUB	Attribute	CATVSL	Category of Vessel	2009-06-19
NPUB	Attribute	CATRGY	Category of Vessel Registry	2009-06-19
HYDRO	Attribute	DATEND	Date end	2000-11-01
HYDRO	Attribute	DATSTA	Date start	2000-11-01
HYDRO	Attribute	INFORM	Information	2000-11-01
HYDRO	Attribute	INFOML	Information, multilingual	2009-06-19
HTDRO	Attribute	LANGGE	Language	2009-06-19
NPUB	Attribute	LIMTYP	Limitation Type	2009-06-19
NPUB	Attribute	GMLLCN	Location Name	2009-06-19
NPUB	Attribute	MAXAIR	Maximum Air Draught	2009-06-19
NPUB	Attribute	MAXBRD	Maximum Breadth (Beam)	2009-06-19
NPUB	Attribute	MAXDPL	Maximum Displacement Tonnage	2009-06-19
NPUB	Attribute	MAXDRF	Maximum Draught	2009-06-19
NPUB	Attribute	MAXDWT	Maximum Deadweight Tonnage	2009-06-19
NPUB	Attribute	MAXGTN	Maximum Gross Tonnage	2009-06-19
NPUB	Attribute	MAXLOA	Maximum Overall Length	2009-06-19
NPUB	Attribute	MAXNTN	Maximum Net Tonnage	2009-06-19
NPUB	Attribute	MINDPL	Minimum Displacement Tonnage	2009-06-19
NPUB	Attribute	MINDWT	Minimum Deadweight Tonnage	2009-06-19
NPUB	Attribute	MINGTN	Minimum Gross Tonnage	2009-06-19
NPUB	Attribute	MINLOA	Minimum Overall Length	2009-06-19
NPUB	Attribute	MINNTN	Minimum Net Tonnage	2009-06-19
HYDRO	Attribute	NATION	Nationality	2000-11-01
NPUB	Attribute	NTCTIM	Notice Time	2009-06-19
NPUB	Attribute	NTCHRS	Notice Time in Hours	2009-06-19
NPUB	Attribute	NTCTXT	Notice Time Text	2009-06-19
HYDRO	Attribute	OBJNAM	Object Name	2000-11-01

Register Dict.	Index	Alpha code	Name	Version Date
HYDRO	Attribute	NOBJNM	Object Name in National Language	2000-11-01
NPUB	Attribute	PRFMNC	Performance	2009-06-19
HYDRO	Attribute	PEREND	Periodic Date End	2000-11-01
HYDRO	Attribute	PERSTA	Periodic Date Start	2000-11-01
HYDRO	Attribute	PICREP	Pictorial Representation	2000-11-01
NPUB	Attribute	RXNCOD	Regulation / restriction / recommendation code	2009-06-19
HYDRO	Attribute	SCAMAX	Scale maximum	2000-11-01
HYDRO	Attribute	SCAMIN	Scale minimum	2000-11-01
HYDRO	Attribute	SORDAT	Source Date	2000-11-01
HYDRO	Attribute	SORIND	Source Indication	2000-11-01
HYDRO	Attribute	STATUS	Status	2000-11-01
HYDRO	Attribute	TXTDSC	Textual Description	2000-11-01
NPUB	Attribute	ICECAP	Thickness of Ice Capability	2009-06-19

4.2.2. Definition Sources

IMDG	International Maritime Dangerous Goods (IMDG) Code
IMO 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. IMO Resolution A 851(20) adopted 27 November 1997
INT 1	Symbols, Abbreviations, Terms used on Charts. IHO
ISO 639-1	Codes for the representation of names of languages - Part 1: Alpha-2 code. International Standards Organisation, 2002. URL: http://www.infoterm.info/standardization/iso_639_1_2002.php retrieved 13 July 2009.
ISO 639-2	Codes for the representation of names of languages - Part 2: Alpha-3 code. International Standards Organisation, 1998. URL: http://www.loc.gov/standards/iso639-2/ retrieved 13 July 2009
ISO 3166-1	Codes for the representation of names countries and their subdivisions - Part 1: Country codes. International Standards Organisation.
M-3	Resolutions of the International Hydrographic Organisation. IHO Publication M-3, July 2007.
M-4	Regulations of the IHO for international charts and chart specifications of the IHO. IHO Publication M-4, Edition 3.006, April 2009.
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, modified by Protocol of 1978. http://www.imo.org/
S-52 A.2	Colour and Symbol specifications for ECDIS, IHO S-52, App. 2, ed. 4.3, 2008, IHO.

4.3. Feature Types

4.3.1. Meta Feature Types

Meta features contain information about other features within a data set. Information defined by meta features override the default metadata values defined by the data set descriptive records. All meta objects are defined in the S-101 Feature Catalogue. S-10? follows the S-101 definitions.

4.3.2. Geographic Feature Types

Geographic feature types form the principal content of navigation chart products (see S-101.)

Waterway information, in contrast, principally consists of information object types and their attributes. The ratio of info types to geo types in Waterway is 5:1. This is an important distinction.

At this time the best understood S-100 application for digital waterway information is ECDIS, which is primarily a geographic navigation tool. Hence S-10? is designed to organize waterway information around geo feature types, for the sake of the ECDIS user interface. The waterway info types provide information and instructions for one geographic feature class:

- Waterway area.

The geographic objects in waterway information are placed on top of one or more of the Category 1 feature classes describing the skin of the earth.

~~In order to achieve the additional benefits of incorporating waterway sailing directions information in ECDIS,~~ Incorporating nautical information in ENC data should share the geometry of "skin of the earth" feature classes if appropriate. If such geometry can't be employed existing lines used by other objects should be used to limit the waterway area.

4.3.3. Theme Feature Types

Theme features are a special kind of collection object. They do not define a feature itself but group other features together. The reasons for the grouping are mostly thematic, other reasons are possible. Each feature object may belong to more than one theme. Themes are therefore not mutually exclusive. Since the kind of association from a theme object to its members (and vice versa) is not variable, the encoding of this type of association is different from the other feature associations. No themes are specifically defined in S-10? in this version. Developers should be mindful that the object classes used in S-10? may participate in a variety of themes for other purposes.

4.3.4. Aggregated Feature Types

Feature with a use type of aggregated can have multiple associations to other feature types. No aggregations are specified in S-10?, but features utilized here may participate in aggregations in other specifications.

(((If displaying the aggregation between waterway and the three cat1 features the section above must be revised)))

4.4. Time Varying Features

ENC may contain temporal geographic features such as tides. S-101 provides detail on temporal geographic features. The geographic features used in S-10? may change over time, but they are not temporal geographic features.

An important distinction: although the geo objects used in waterway are static features, the information objects associated to them are liable in time-varying content. Please refer to Information Types, paragraph 4.5.

4.5. Information Types

Information types are identifiable pieces of information in a cell that can be shared between other features. They have attributes like all feature types but have no geometry of their own. Information types may reference other information types and may reference feature types, as is the case in S-10?.

4.5.1. Conditional Information

Waterway information topics are characterized by conditional information (e.g., “the regulation X applies if the vessel meets the limitations A and B.”) and step-wise sequences of instructions. It must be understood that there are limits in the ability of encoded, discrete data to communicate conditional information instructions to the mariner.

4.6. Feature integrity

4.6.1. Feature level CRC values

S-10? follows the specifications for CRC data quality assurance defined in S-101.

4.7. Attributes

4.7.1. Complex Attributes

S-10? follows the S-100 definitions of complex attributes. Complex attributes are used extensively in S-10? to distinguish and classify:

- Language localization for named objects, places, and text content.

4.7.2. Numeric Attribute Values

S-10? follows S-100.

4.7.3. Text Attribute Values

S-10? follows S-100.

4.7.4. Text Formatting and Portrayal

Effective communication of waterway information found in sailing directions requires an ability to format and layout text content that is beyond the guidelines found in S-100 at this time.

Note also that the rules specified in S-52 for portrayal of text and graphics are inadequate for a new generation of ECDIS intended to serve as an integrated system for navigation charting and nautical information found in sailing directions and other publications. S-10? Version ?? can not entirely resolve this issue. This version provides a means to classify the information with integrity, but will require an improved level of cooperation between the HSSC working groups to define an effective solution for text formatting and portrayal.

4.7.5. Mandatory Attribute Values

S-10? follows S-100.

All mandatory attributes are identified in the feature catalogue.

4.7.6. Unknown Mandatory Attribute Values

S-10? follows S-100.

4.8. Associations

S-10? specifies associations between information objects and between information objects and geographic objects. No associations between geographic types is required in S-10?.

4.9. Roles

S-10? follows S-100.

4.10. Cells

The contents of this section are to be determined.

4.11. Unique Universal Identifier

Each feature and information type must have a unique universal identifier (UUID). The UUID may be used to identify multiple instances of the same feature. For example, the same feature may appear in different display scales, or a feature may be split by the cell structure. In these circumstances each instance of this feature may have the same identifier. UUIDs must not be reused even when a feature has been deleted.

4.12. Scale Independent and Scale Dependent

S-10? geo features generally follow the S-101 specifications for scale dependency. Certain attributes of features in S-10? and their information types can be text-intensive; portrayal of this content requires appropriate design augmenting existing standards to serve integrated text and nautical information applications. The figure below shows the content of cells in the various scopes.

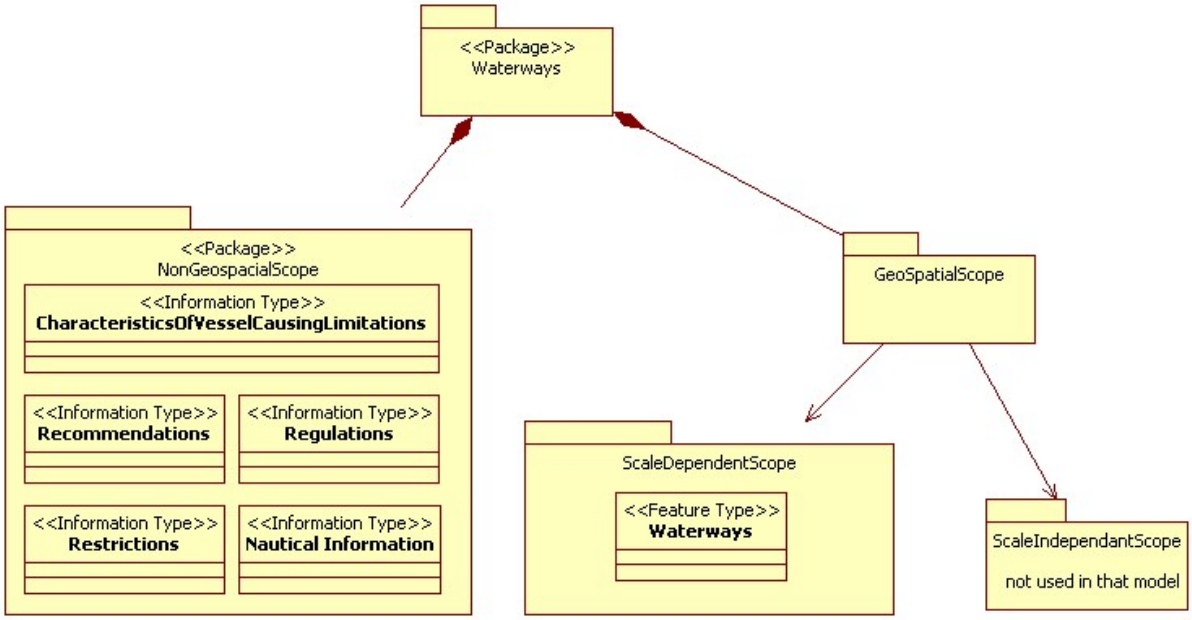

Figure 5. Relationships of scale dependent and waterway packages to scopes

5. Coordinate Reference Systems

Spatial Reference System WGS84

6. Data Quality

IHO Data Quality Working Group (DQWG) should be consulted. HSSC should be asked to amend the terms of reference of the DQWG to include nautical publications information quality.

7. Data Capture and Classification

Data source	Hydrographic Office; Port Authority; Local Waterway Authority; Governments; IMO COLREG Circulars; IMO MSC Circulars; IMO SN Circulars;
Production Process	ToBeDefined

The data capture and classification guide does not cover each and every concept that can be expressed using the objects, attributes, and roles in the feature catalogue, since the descriptions in the feature catalogue suffice for the simpler concepts. The data capture and classification guide covers only the more difficult concepts or combinations. Section 7.1 below contains samples.

7.1. Regulations /Restrictions/Recommendations/Nautical Information

Regulations/Recommendations/Restrictions/Nautical Information applicable to an area are encoded as one or more information object REGLTS (Regulations), RESDES (Restrictions), RCMDTS (Recommendations), Nautical Information (NATINF) associated with a waterway (Waterway Area) object covering the area. The information itself is stored in the TXTDSC attribute
NATINF (Nautical Information) is intended for only general information. The distinction between NATINF and REGLTS/RESDES/RCMDTS must be guaranteed.

Geo Object: Waterway Area
Attribute: OBJNAM (name of the area)
Attribute: NOBJNM (name of the area in national language)
Information Object: REGLTS (Regulations)
Information Object: RESDES (Restrictions)
Information Object: RCMDTS (Recommendations)
Information Object: Nautical Information (NATINF)

The text of the regulations/Restrictions/Recommendations is contained in the named file TXTDSC.

Information Object: REGLTS (Regulations), Restrictions (RESDES), RCMDTS (Recommendations)
Attributes:
CATAUT = categoryOfAuthority

Information Object: NATINF (NauticalInformation)
Attributes:
CATAUT = categoryOfAuthority

7.1.1. Regulations/Restrictions/Recommendations applying only to selected vessels

Regulations applying only to selected vessels are encoded by placing a CHALIM (CharacteristicsOfVesselCausingLimitations) between the geo feature class and REGLTS, RESDES, RCMDTS objects by means of an information association from the CHALIM object to the REGLTS, RESDES, RCMDTS object. The attributes describing the vessel characteristics must be used to encode the characteristic upon which the limitation depends. For example, to encode a regulation that applies only to vessels exceeding a draft of 12.0 metres state CHALIM/MAXDRF=12.0.

Note that the specification of CHALIM uses logical disjunction for combinations of the attributes describing vessel characteristic, i.e., if a CHALIM object has MAXDRF=10.0 and MAXBRD=5.0 (and LIMTYP=10), the regulation with which this CHALIM is associated applies to vessels that have EITHER

draft of 10.0 metres or more, OR beam 5.0 metres or more, OR both.

Check if limtyp will survive and if yes, re-insert here

DATSTA/DATEND and PERSTA/PEREND may be used to specify the dates or period respectively during which the limitation applies.
Note also that CHALIM may not be able to express all combinations of limitations that might exist. In this case use INFOML or TXTDSC to describe the limitation in words.

Information Object: CharacteristicsOfVesselCausingLimitations (CHALIM)
Attributes:
LIMTYP = select appropriate value from values list
CATCGO CATDHC CATVES ICECAP MAXAIR MAXBRD MAXDPL MAXDWT MAXGTN MAXLOA MAXNTN MINDPL MINDWT MINGTN MINNTN DATSTA DATEND PERSTA PEREND

7.2. Some data capture rule specific to waterway?

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8. Data Product Format

Data product formats are to be determined.

9. Data Product Delivery

Data product delivery is to be determined.

10. Data Maintenance

Maintenance and update frequency	As needed
Data source	TBD
Production process	TBD

11. Portrayal

Portrayal library citation	Colour and Symbol specifications for ECDIS, IHO S-52, App. 2, ed. 4.3, 2008. (to be updated for S-100 and nautical publications).

Portrayal rules for nautical publications information remain to be determined. IHO Digital Information Portrayal Working Group (DIPWG) must be consulted

Selected extracts from S-52 Ed. 4.3 sections 3.1.5 and 3.4 (repeated with insignificant changes in Draft S-52 Ed. 6, Winter 2009. sections 3.1.5 and 3.4):

> *From S. 3.1.5:*
> *Lines and symbols and text should be large enough that they can be easily interpreted at the operational viewing distance. This will be about 70 cm for route planning, but experience to date indicates that the viewing distance for important features during route monitoring may be several metres.*

Human factors experts quote a minimum requirement that symbols and characters subtend 20 arc minutes at the observers eye (for example, a symbol viewed from 70cm for route planning should be about 4mm in size, 1.5 times the size of a normal chart symbol. Two times chart size is a good general rule.) Symbols and characters important for route monitoring may have to be significantly bigger.

For clear representation, symbols require a minimum number of screen units (pixels), depending on their complexity. A simple chart symbol should extend about 12 pixels (that is about 4mm for an IHO standard screen.)
The minimum sizes for all symbols should be as shown in the Presentation Library.
In addition, the symbols should always be drawn with at least the same number of pixels as are required to draw the symbol at the size defined in the Library for the minimum resolution and minimum chart display area (270x270 mm). *That is, the minimum height in pixels of a symbol is: (symbol height in mm) divided by 0.312 mm (where 0.312 mm is the "pixel size" for the minimum size chart display in S-52 section 8 - Display Resolution).* When the display scale is enlarged by zooming in, it should be possible to hold symbol size constant. The same applies to text. Symbol and text size should never be decreased when zooming out.

The text on the ECDIS should be readable from 1 metre. Sans serif, non-italic fonts should be used. The computer ø should not be used.

Because several appropriate commercial fonts are available, the Presentation Library does not specify alphanumerics, except for soundings. The manufacturer should make his own arrangements for the use of a font. A plain, clearly readable font such as Univers should be used. In most fonts, pica 8 is too small too read. IEC 60945 specifies that character size in mm be not less than 3.5 x the viewing distance in metres. Hence "readable from 1 metre" requires that characters be not less than 3.5 mm in size.

From S. 3.4:
Text as part of the route monitoring display
Text information should be used on the route monitoring display only when unavoidable, since it has to be written large to be readable and so causes clutter.
Details of displaying text are given in 3.1.5 and in the Presentation Library.

Text windows, explanatory diagrams etc. superimposed on the route monitoring display
The 270mm by 270mm minimum area of chart presentation for route monitoring should normally be used for chart and navigation information alone.
Any windows containing text, diagrams, etc superimposed on the route monitoring display should be temporary, and should not obscure important chart or navigational information. Such windows should use only the "User Interface" colours from the Presentation Library. It should be possible for the mariner to relocate a window in a less important part of the display, such as on land, or behind the ship.

Separate text panel on the same screen as the route monitoring display
A Mariner's Information Panel, consisting mainly of text (alphanumerics), might include:
- ECDIS alarms and indications, e.g. “crossing safety contour",
- navigation information, e.g. time, position, course to make good, etc.,
- chart information, e.g. contour selected for own-ship safety contour,
- supplementary chart information, e.g. tide tables, sailing directions,
- interface dialogue, e.g. "change to night colour table".
- etc.
Sea experience has shown that the text panel on the route monitoring display may have a prominence out of proportion to its significance to safety of navigation. This is particularly damaging to ECDIS performance at night, when the strictly dimmed chart display, which carries nearly all of the information of importance to navigation, may be overwhelmed by the light emitted from large, bold or bright characters on the text display, some conveying relatively unimportant information.
The text panel should be outside the 270 by 270 mm minimum area designated for the route monitoring chart display by the IMO PS. The colours, symbols and luminance of this user interface panel should not degrade the SENC information on the chart display.
At night it is essential that any interface panel or other information added by the manufacturer to the screen carrying the chart display should never generate more light than the chart display itself. Great care is taken to reduce the light emitted by the chart in order to preserve the mariners night vision, and it is dangerous to ship safety if added non-chart information defeats that purpose.
It is particularly important to limit the information shown using the conspicuous colour token "UINFD", which is reserved for important information. Even a small panel of text in this colour can produce more light on the bridge than the entire route monitoring chart display.

Text shown on a separate auxiliary screen
A separate screen may be provided for text display, either instead of or in addition to a panel on the main screen used for the route monitoring display. The presentation on this auxiliary screen need not follow these specifications in detail, but should conform in general, to avoid confusion, and should meet the same bridge lighting constraints.
All information displays should be designed in accordance with ergonomic principles.

12. Additional Information

TBD.

Validation and data consistency

Check STATUS of HYDRO feature classes and WATARE
Check DRVAL1 information of HYDRO and NP text before encoding
Check OBJNAM of SEAARE and WATARE
Check data consistency between given draught and water depth+ height of the tide

13. Metadata

Name	Cardinality	Value	Type	Remarks
DataSetDiscoveryMetadata	-		-	-
metadataFileIdentifier	1		CharacterString	
metadataPointOfContact	1		CI_ResponsibleParty	
metadataDateStamp	1		Date	
metadataLanguage	1	English	CharacterString	All data sets conforming to S-101 PS must use English language
fileName	1		CharacterString	Dataset file name
filePath			CharacterString	Full path from the exchange set root directory
abstract	1		CharacterString	Short description of the area covered by dataset harbour or port name, between two named locations etc.
dataProtection	1	{1} to {2}	CharacterString	1. Encrypted 2. Unprotected
purpose	1	{1} to ?	CharacterString	
specificUsage	1	{1} to ?	CharacterString	1. Passage between two defined points [Others TBD.]
editionNumber	1		CharacterString	TBD
updateNumber	1		CharacterString	TBD
updateApplicationDate	0..1		Date	TBD
issueDate	1		Date	TBD
productSpecification	1		S-10? ProductSpecification	This must be encoded as S-10?

producingAgency	1		CI_ResponsibleParty	
displayScale	1	?	double	TBD
horizontalDatum	1		CharacterString	
dataType	1		S-100_DataFormat	
otherDataTypeDescription	0..1		CharacterString	
boundingBox	1		EX_GeographicBoundingBox	
boundingPolygon	1		EX_BoundingPolygon	
comment	0..1		CharacterString	
cyclicRedundancyCheck	1		CharacterString NonNegativeInteger	
layerId	1..*		Double	Identifies the relationship to other layers that are required to view the complete data set.

Annex A. Named Types

Geo Object Class: Waterway Area (Named) Alpha code: **WATARE**

Camel case: **WaterwayArea** Abstract type: False

Definition: A defined (and possibly named) waterway area. A waterway is a line of water (river, channel, etc.) which can be utilized for communication or transport.

References: INT 1: not specified; M-4: not specified; S-32: Part 1, Vol. 1, 1994, no. 5881

Remarks: No remarks.

Spatial Objects: Area (GM_Polygon)

Distinction: SEAARE

Attribute	Camel case	Alpha code	Cardinality	Sequential
Object Name	objectName	OBJNAM	0..*	False
Information, multilingual	informationMultilingual	INFOML	0..*	False
Scale maximum	scaleMaximum	SCAMAX	0..1	
Pictorial representation	pictorialRepresentation	PICREP	0..1	
Scale minimum	scaleMinimum	SCAMIN	0..1	
Textual description	textualDescription	TXTDSC	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	
??????????????				
Date, end	dateEnd	DATEND	0..1	
Date, start	dateStart	DATSTA	0..1	
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	

Information feature	Camel case	Alpha code	Cardinality
Regulations	Regulations	REGLTS	0..*
Restrictions	Restrictions	RESDES	0..*
Recommendations	Recommendations	RCMDTS	0..*
Nautical Information	NauticalInformation	NATINF	0..*
Characteristics of vessels which cause limitations	CharacteristicsOfVesselsCausingLimitations	CHALIM	0..*

Information Object Class: Characteristics of vessels which cause limitations Alpha code: **CHALIM**

Camel Case: **CharacteristicsOfVesselsCausingLimitations** Abstract type: False

Definition: Characteristics of vessels (by construction, cargo or performance), which limit the passage of vessels, or the use by vessels, of an area or facility.

References: INT 1: unspecified; M-3: Chapter C, Section C 3.3 M-4: unspecified;

Remarks: This object is used to describe the characteristics of vessels, which limit the passage of a vessel, or the use of a facility by a vessel, because the vessel is:
• carrying ballast water.
• matches one of the values in the ship type, cargo type or dangerous or hazardous cargo type attributes;
• or does not match the performance requirements;
• or exceeds one of the “max” attributes;
• or is less than one of the “min” attributes.
As an example of how this information object could be used, ship dimensions or type of cargo could be used in combination with a related geographic object, in which regulations (e.g. length limit or type of cargo restrictions) apply.

Distinction: No distinctions.

Attribute	**Camel case**	**Alpha code**	**Cardinality**	**Sequential**
Ballast	ballast	BALAST	0..1	
Category of cargo	categoryOfCargo	CATCGO	0..*	False
Category of dangerous or hazardous cargo or ballast	categoryOfDangerousOrHazardousCargo	CATDHC	0..1	
Category of vessel	categoryOfVessel	CATVSL	0..*	False
Date end	dateEnd	DATEND	0..1	
Date start	dateStart	DATSTA	0..1	
Thickness of ice capability	thicknessOfIceCapability	ICECAP	0..1	
Limitation type	limitationType	LIMTYP	0..1	
Maximum air draught	maximumAirDraught	MAXAIR	0..1	
Maximum breadth (beam)	maximumBreadth	MAXBRD	0..1	
Maximum displacement tonnage	maximumDisplacementTonnage	MAXDPL	0..1	
Maximum draught	maximumDraught	MAXDRF	0..1	
Maximum deadweight tonnage	maximumDeadweightTonnage	MAXDWT	0..1	
Maximum gross tonnage	maximumGrossTonnage	MAXGTN	0..1	
Maximum overall length	maximumOverallLength	MAXLOA	0..1	
Maximum net tonnage	maximumNetTonnage	MAXNTN	0..1	

Minimum displacement tonnage	minimumDisplacementTonnage	MINDPL	0..1	
Minimum deadweight tonnage	minimumDeadweightTonnage	MINDWT	0..1	
Minimum gross tonnage	minimumGrossTonnage	MINGTN	0..1	
Minimum overall length	minimumOverallLength	MINLOA	0..1	
Minimum net tonnage	minimumNetTonnage	MINNTN	0..1	
Object Name	objectName	OBJNAM	0..*	False
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	
Performance	performance	PRFMNC	0..1	
Information, multilingual	informationMultilingual	INFOML	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	

Information feature	**Camel case**	**Alpha code**	**Cardinality**
Regulations	Regulations	REGLTS	0..*
Restrictions	Restrictions	RESDES	0..*
Recommendations	Recommendations	RCMDTS	0..*

Information Object Class: Regulations

Alpha code: **REGLTS**

Camel Case: **Regulations**

Abstract type: False

Definition: Regulations for a related area or facility.

References: INT 1: M-3: Chapter C 2.2.1, C 2.7, C 2.8, C 3.19, C 3.21 M-4:

Remarks: No remarks.

Distinctions: NATINF; RCMDTS; RESDES;

Attribute	Camel case	Alpha code	Cardinality	Sequential
Category of authority	categoryOfAuthority	CATAUT	1	
Category of Regulation / Restriction / Recommendation	categoryOfRxN	CATRXN	0..*	False
Date, end	dateEnd	DATEND	0..1	
Date, start	dateStart	DATSTA	0..1	
Object Name	objectName	OBJNAM	0..*	False
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	
Regulation / restriction / recommendation code	rxnCode	RXNCOD	0..*	False
Information, multilingual	informationMultilingual	INFOML	0..*	False
Scale max	scaleMaximum	SCAMAN	0..1	
Scale minimum	scaleMinimum	SCAMIN	0..1	
Textual description	textualDescription	TXTDSC	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	

Information Object Class: Recommendations

Alpha code: **RCMDTS**

Camel Case: **Recommendations**

Abstract type: False

Definition: Recommendations for a related area or facility.

References: INT 1: M-3: Chapter C 2.2.1, C 2.7, C 2.8, C 3.19, C 3.21 M-4:

Remarks: No remarks.

Distinctions: NATINF; REGLTS; RESDES;

Attribute	Camel case	Alpha code	Cardinality	Sequential
Category of authority	categoryOfAuthority	CATAUT	1	
Category of Regulation / Restriction / Recommendation	categoryOfRxN	CATRXN	0..*	False
Date, end	dateEnd	DATEND	0..1	
Date, start	dateStart	DATSTA	0..1	
Object Name	objectName	OBJNAM	0..*	False
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	
Regulation / restriction / recommendation code	rxnCode	RXNCOD	0..*	False
Information, multilingual	informationMultilingual	INFOML	0..*	False
Scale max	scaleMaximum	SCAMAN	0..1	
Scale minimum	scaleMinimum	SCAMIN	0..1	
Textual description	textualDescription	TXTDSC	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	

Information Object Class: Restrictions

Alpha code: **RESDES**

Camel Case: **Restrictions**

Abstract type: False

Definition: Restrictions for a related area or facility.

References: INT 1: M-3: Chapter C 2.2.1, C 2.7, C 2.8, C 3.19, C 3.21 M-4:

Remarks: No remarks.

Distinctions: NATINF; RCMDTS; RESDES;

Attribute	Camel case	Alpha code	Cardinality	Sequential
Category of authority	categoryOfAuthority	CATAUT	1	
Category of Regulation / Restriction / Recommendation	categoryOfRxN	CATRXN	0..*	False
Date, end	dateEnd	DATEND	0..1	
Date, start	dateStart	DATSTA	0..1	
Object Name	objectName	OBJNAM	0..*	False
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	
Regulation / restriction / recommendation code	rxnCode	RXNCOD	0..*	False
Information, multilingual	informationMultilingual	INFOML	0..*	False
Scale max	scaleMaximum	SCAMAN	0..1	
Scale minimum	scaleMinimum	SCAMIN	0..1	
Textual description	textualDescription	TXTDSC	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	

Information Object Class: Nautical Information

Alpha code: **NATINF**

Camel Case: **NauticalInformation**

Abstract type: False

Definition: Nautical Information for a related area or facility.

References: INT 1: M-3: Chapter C 2.2.1, C 2.7, C 2.8, C 3.19, C 3.21 M-4:

Remarks: No remarks.

Distinctions: REGLTS; RCMDTS; RESDES;

Attribute	Camel case	Alpha code	Cardinality	Sequential
Category of authority	categoryOfAuthority	CATAUT	1	
Category of Regulation / Restriction / Recommendation	categoryOfRxN	CATRXN	0..*	False
Date, end	dateEnd	DATEND	0..1	
Date, start	dateStart	DATSTA	0..1	
Object Name	objectName	OBJNAM	0..*	False
Periodic date end	periodicDateEnd	PEREND	0..1	
Periodic date start	periodicDateStart	PERSTA	0..1	
Regulation / restriction / recommendation code	rxnCode	RXNCOD	0..*	False
Information, multilingual	informationMultilingual	INFOML	0..*	False
Scale max	scaleMaximum	SCAMAN	0..1	
Scale minimum	scaleMinimum	SCAMIN	0..1	
Textual description	textualDescription	TXTDSC	0..*	False
Source date	sourceDate	SORDAT	0..1	
Source indication	sourceIndication	SORIND	0..1	

Annex B. Property Types

Attribute: Category of authority
Attribute type: Simple
Camel case: categoryOfAuthority

Alpha code: CATAUT

Data Type: Enumeration

Definition: ?

Values:

Code	Name	Definition
1	customs	The agency or establishment for collecting duties, tolls. (Merriam-Websters online Dictionary 23rd February 2006, amended).
2	border control	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).
3	police	The department of government, or civil force, charged with maintaining public order. (Adapted from OED)
4	port	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)
5	immigration	The authority controlling people entering a country.
6	health	The authority with responsibility for checking the validity of the health declaration of a vessel and for declaring free pratique.
7	coast guard	Organisation keeping watch on shipping and coastal waters according to governmental law; normally the authority with responsibility for search and rescue.
8	agricultural	The authority with responsibility for preventing infection of the agriculture of a country and for the protection of the agricultural interests of a country
9	military	A military authority which provides control of access to or approval for transit through designated areas or airspace.
10	private company	a private or publicly owned company or commercial enterprise which exercises control of facilities, for example a calibration area.
11	maritime police	a governmental or military force with jurisdiction in territorial waters. Examples could include Gendarmerie Maritime, Carabinierie, and Guardia Civil.
12	environmental	an authority with responsibility for the protection of the environment.
13	fishery	an authority with responsibility for the control of fisheries.
14	finance	an authority with responsibility for the control and movement of money
15	maritime	a national or regional authority charged with administration of maritime affairs.

References: INT 1: unspecified; M-4: unspecified;

Remarks: No remarks.

Attribute: Category of cargo
Attribute type: Simple
Camel case: categoryOfCargo

Alpha code: CATCGO

Data Type: Enumeration

Definition: ?

Values:

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

References: INT 1: unspecified; M-4: unspecified;

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

Attribute: Category of dangerous or hazardous cargo or ballast — Alpha code: CATDHC
Attribute type: Simple
Camel case: categoryOfDangerousOrHazardousCargo — Data Type: Enumeration

Definition: ?

Values:

Code	Name	Definition
1	Class 1; Division 1.1	Explosives, Division 1: substances and articles which have a mass explosion hazard
2	Class 1; Division 1.2	Explosives, Division 2: substances and articles which have a projection hazard but not a mass explosion hazard
3	Class 1; Division 1.3	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
4	Class 1; Division 1.4	Explosives, Division 4: substances and articles which present no significant hazard
5	Class 1; Division 1.5	Explosives, Division 5: very insensitive substances which have a mass explosion hazard
6	Class 1; Division 1.6	Explosives, Division 6: extremely insensitive articles which do not have a mass explosion hazard
7	Class 2.1	Gases, flammable gases
8	Class 2.2	Gases, non-flammable, non-toxic gases
9	Class 2.3	Gases, toxic gases
10	Class 3	flammable liquids
11	Class 4.1	flammable solids, self-reactive substances and desensitized explosives
12	Class 4.2	substances liable to spontaneous combustion
13	Class 4.3	substances which, in contact with water, emit flammable gases
14	Class 5.1	oxidizing substances
15	Class 5.2	organic peroxides
16	Class 6.1	toxic substances
17	Class 6.2	infectious substances
18	Class 7	Radioactive material
19	Class 8	Corrosive substances
20	Class 9	Miscellaneous dangerous substances and articles
21	Harmful Substances in packaged form	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)

References: International Maritime Dangerous Goods (IMDG) Code

Remarks: Substances (including mixtures and solutions) and articles subject to the provisions of the International Maritime Dangerous Goods (IMDG) Code are assigned to one of the classes 1-9 according to the hazard or the most predominant of the hazards they present. Some of these classes are subdivided into divisions. These classes or divisions are as listed in IDs 1 : 20 above. (Adapted from IMDG code www.imo.org).

Attribute: Category of regulation / restriction / recommendation — Alpha code: CATRXN
Attribute type: Simple
Camel Case: categoryOfRxN — Data Type: Enumeration

Definition: The broad category or semantic group to which the information, regulation, restriction, or recommendation pertains. These broad categories may correspond to subdivision titles in sailing directions.

Values:

Code	Name	Definition
1	pilotage	Regulation/restriction/recommendation pertaining to pilotage
2	traffic separation, recommended routes, navigation and collision avoidance	Regulation/restriction/recommendation pertaining to traffic separation, recommended routes, and navigation and collision avoidance, for example, overtaking and head-on situations, navigation in fairways or channels, COLREGS
3	use of anchorages	Regulation/restriction/recommendation pertaining to use of anchorages
4	requirements and permissions for the use of port services and facilities	Regulation/restriction/recommendation pertaining to requirements and permissions for the use of port services and facilities, such as tug assistance
5	nature reserves, protected species, environmental protection and pollution	Regulation/restriction/recommendation pertaining to nature reserves, protected species, environmental protection and pollution
6	security and customs	Regulation/restriction/recommendation pertaining to security and customs
7	offshore and coastal activities dangerous to shipping	Regulation/restriction/recommendation pertaining to offshore and coastal activities dangerous to shipping such as drilling platforms, military exercises, dumping grounds
8	required filings and reports for VTS and ship reporting systems	Regulation/restriction/recommendation pertaining to required filings and reports for VTS and ship reporting systems
9	required filings and reports other than VTS and ship reporting systems	Regulation/restriction/recommendation pertaining to required filings and reports other than VTS and ship reporting systems
10	hazards and obstructions	Regulation/restriction/recommendation pertaining to hazards and obstructions
11	operation of vessels in severe weather or other special meteorological conditions	Regulation/restriction/recommendation pertaining to operation of vessels in severe weather or other special meteorological conditions
12	signalling and ship-to-ship communications	Regulation/restriction/recommendation pertaining to signalling and ship-to-ship communications
13	small craft operations	Regulation/restriction/recommendation pertaining to small craft operations
14	commercial cargo operations	Regulation/restriction/recommendation pertaining to commercial cargo operations
15	aids to navigation	Regulation/restriction/recommendation pertaining to aids to navigation
16	miscellaneous port and waterway safety	Regulation/restriction/recommendation pertaining to miscellaneous port and waterway safety
17	regulated navigation areas and limited access areas	Regulation/restriction/recommendation pertaining to regulated navigation areas and limited access areas

18	danger zones and restricted area regulations	Regulation/restriction/recommendation pertaining to danger zones and restricted area regulations danger zones and restricted area regulations

References: M-3 Chapters C 2.2, C 2.8; BSH new-format Sailing Directions; US Coast Pilot Chapter 2, Navigation Regulations (multiple volumes)

Attribute: Category of vessel
Attribute type: Simple
Camel case: categoryOfVessel

Alpha code: CATVSL

Data Type: Enumeration

Definition: ?

Values:

Code	Name	Definition
1	general cargo vessel	a vessel designed to carry general cargo
2	container carrier	a vessel designed to carry ISO containers
3	tanker	a vessel designed to carry bulk liquid or gas, including LPG and LNG
4	bulk carrier	a vessel designed to carry bulk solid material
5	passenger vessel	a vessel designed to carry passengers; often a cruise ship
6	roll-on roll-off	a vessel designed to allow road vehicles to be driven on and off; often a ferry
7	refrigerated cargo vessel	a vessel designed to carry refrigerated cargo
8	fishing vessel	a vessel designed to catch or hunt fish
9	service	a vessel which provides a service such as a tug, anchor handler, survey or supply vessel
10	warship	a vessel designed for the conduct of military operations

References: ?

Remarks: ?

Attribute: Category of vessel registry
Attribute type: Simple
Camel case: categoryRegistry

Alpha code: CATRGY

Data Type: Enumeration

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

Values:

Code	Name	Definition
1	domestic	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.
2	foreign	The vessel is registered or enrolled under a national flag different from the port, harbour, territorial sea, exclusive economic zone, or other administrative area which the object that possesses this attribute applies or is located.
3	both domestic and foreign	The vessel is registered or enrolled under more than one flag, one of which is the same as that of the port, harbour, territorial sea, exclusive economic zone, or other administrative area which the object that possesses this attribute applies or is located.

Attribute: Date end
Alpha code: DATEND
Attribute type: Simple
Camel case: dateEnd
Data Type: Date

Definition: The attribute “date end” indicates the latest date on which an object (e.g. a buoy) will be present.

Constraints:

Other	CCYYMMDD, consisting of 4 digits for the calendar year (CCYY), 2 digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD), according to ISO 8601:1988

References: ?

Remarks: This attribute is to be used to indicate the removal or cancellation of an object at a specific date in the future. See also “periodic date end”. Example: 19961007 for 07 October 1996 as ending date.

Attribute: Date start
Attribute type: Simple
Camel case: dateStart

Alpha code: DATSTA

Data Type: Date

Definition: The attribute “date, start” indicates the earliest date on which an object (e.g. a buoy) will be present.

Constraints:

Other	CCYYMMDD, consisting of 4 digits for the calendar year (CCYY), 2 digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD), according to ISO 8601:1988

References: ?

Remarks: This attribute is to be used to indicate the deployment or implementation of an object at a specific date in the future. See also “periodic date start”. Example: 19960822 for 22 August 1996 as starting date.

Attribute: Information
Attribute type: Simple
Camel case: information

Alpha code: INFORM

Data type: text

Definition: Textual information about the object in a single language.

References: INT 1: IA 16; M-4: 242.3-5;

Remarks: The language is expected to be specified in an accompanying attribute (see INFOML, LANGGE).
This attribute 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 INFORM. If formatted text is required, then the attribute TXTDSC must be used.
[Multi-lingual attributes are being defined by TSMAD.]

Attribute: Information, multi-lingual
Attribute type: Complex
Camel case: informationMultilingual

Alpha code: INFOML

Data type: Complex

Definition: Container for textual information about the object in a single language and identification of the language used.

Sub-Attributes:

Name	Alpha code	Camel case	Cardinality	sequential
Language	LANGGE	language	1	n/a
Information	INFORM	information	1	n/a

References: INT 1: IA 16(?); M-4: 242.3-5(?);

Remarks: This complex attribute links the text in a particular INFORM attribute with the language used in it.
Example: To code the text “Nondangerous wrecks have been omitted from this area” in English, use LANGGE=”en”, INFORM=” Nondangerous wrecks have been omitted from this area”.
[The specification of multi-language attributes is being discussed by TSMAD.]

Attribute: Language
Attribute type: Simple
Camel case: language

Alpha code: LANGGE

Data Type: text

Definition: The name of a natural language.

Remarks: The value of this attribute must be one of the Alpha-2 codes specified in ISO 639-2:1998.
Distinction: Language information (LNGINF);
[The specification of multi-language attributes is being discussed by TSMAD.]

Attribute: Limitation type
Attribute type: Simple
Camel case: limitationType

Alpha code: LIMTYP

Data Type: Enumeration

Definition: This attribute describes the interpretation of a “chalim” information object in the context of the object(s) with which it is associated.

Values:

Code	Name	Definition
1	prohibited	use of facility (boarding place, etc.) by vessels satisfying the conditions is prohibited
2	required	use of facility (boarding place, etc.) by vessels satisfying the conditions is required
3	permitted	use of facility (boarding place, etc.) by vessels satisfying the conditions is permitted but not required
4	recommended	use of facility (boarding place, etc.) by vessels satisfying the conditions is recommended
10	included	associated information object applies to vessels satisfying the conditions
11	excepted	associated information object does not apply to vessels satisfying the conditions

Remarks: The conditions under which the limitation operates are those expressed by the “chalim” object to which this attribute is bound.

Attribute: Maximum air draught — Alpha code: MAXAIR
Attribute type: Simple
Camel case: maximumAirDraught — Data Type: Real

Definition: The maximum allowed height of the highest point of a vessel above the water-line.

Unit of measure: ?
Quantity: length

Constraints:

range	[0, ∞)

References: Adapted from UKHO NP100/2004

Remarks: Example: 022.55 for a maximum air draught of 22.55 metres.
(Unit: defined in the HUNITS attribute of the M_UNIT meta object class, e.g. metre (m))
Resolution: 0.01

Attribute: Maximum breadth (beam) Alpha code: MAXBRD
Attribute type: Simple
Camel case: maximumBreadth Data Type: Real

Definition: The maximum allowed breadth (beam) of a vessel.

Unit of measure: ?
Quantity: length

Constraints:

range	[0, ∞)

References: ?

Remarks: Example: 22.54 for an allowed maximum breadth of 22.54 metres.
(Unit: defined in the HUNITS attribute of the M_UNIT meta object class, e.g. metre (m))
Resolution: 0.01

Attribute: Maximum displacement tonnage
Attribute type: Simple
Camel case: maximumDisplacementTonnage

Alpha code: MAXDPL

Data Type: Integer

Definition: The maximum allowed displacement tonnage of a vessel.

Unit of measure: ?
Quantity: mass?

Constraints:

range	[1, ∞)

References: not specified;

Remarks: Example: 22254 for allowed maximum displacement tonnage of 22254.
(Unit: defined in the wunits attribute of the M_UNIT meta object class, e.g. metric tons (t))
Resolution: 1

Attribute: Maximum draught
Alpha code: MAXDRF
Attribute type: Simple
Camel case: maximumDraught
Data Type: Real

Definition: The maximum allowed vertical distance, at any section of a vessel from the surface of the water to the bottom of the keel.

Unit of measure: ?
Quantity: length

Constraints:

range	[0, ∞)

References: adapted from IHO Dictionary, S-32, 5th Edition, 1448

Remarks: Example: 12.56 for a maximum draught of 12.56 metres.
Unit: defined in the HUNITS attribute of the M_UNIT meta object class, e.g. metre (m))
Resolution 0.01

Attribute: Maximum deadweight tonnage
Alpha code: MAXDWT
Attribute type: Simple
Camel case: maximumDeadweightTonnage
Data Type: Integer

Definition: The maximum allowed deadweight tonnage of a vessel.

Unit of measure: tonnes
Quantity: mass

Constraints:

range	[1, ∞)

References: not specified;

Remarks: Example: 12345 for allowed maximum deadweight tonnage of 12345.
Unit defined in the wunits attribute of the M_UNIT meta object class, e.g. metric tons (t)
Resolution: 1

Attribute: Maximum gross tonnage
Alpha code: MAXGTN
Attribute type: Simple
Camel case: maximumGrossTonnage
Data Type: Integer

Definition: The maximum allowed gross tonnage of a vessel. A gross ton is a unit of gross internal capacity equal to 100 cubic ft (2.83 cubic m) (adapted from Oxford Dictionary of English). Gross tonnage is a function of the moulded volume of all enclosed spaces of the ship (International Convention on Tonnage Measurements in Ships, 1969).

Unit of measure: GT
Quantity: volume

Constraints:

range	[1, ∞)

Remarks: No remarks.

References: Oxford Dictionary of English; International Convention on Tonnage Measurements in Ships, 1969; IMO web page on International Convention on Tonnage Measurements in Ships, 1969 (URL: http://www.imo.org/Conventions/mainframe.asp?topic_id=259&doc_id=685 retrieved 01 July 2009).

Remarks: Example: 98765 for allowed maximum gross tonnage of 98765.
GT is the abbreviation in the IMO Convention.
Resolution: 1

Attribute: Maximum overall length
Attribute type: Simple
Camel case: maximumOverallLength

Alpha code: MAXLOA

Data Type: Real

Definition: The maximum allowed overall length of a vessel

Unit of measure: ?
Quantity: length

Constraints:

range	[0, ∞)

References: not specified;

Remarks: Example: 82.54 for an allowed maximum overall length of 82.54 metres.
Unit defined in the HUNITS attribute of the M_UNIT meta object class, e.g. metre (m)
Resolution: 0.13 m or 0.13 ft

Attribute: Maximum net tonnage
Alpha code: MAXNTN
Attribute type: Simple
Camel case: maximumNetTonnage
Data Type: Integer

Definition: The maximum allowed net tonnage of a vessel. A net ton is the taxable gross tonnage of a merchant ship. The net tonnage is produced by a formula which is a function of the moulded volume of all cargo spaces of the ship (International Convention on Tonnage Measurements in Ships, 1969).

Unit: NT
Quantity: volume

Constraints:

range	[1, ∞)

References: International Convention on Tonnage Measurements in Ships, 1969

Remarks: Example: 45678 for allowed maximum net tonnage of 45678. See the remark for maximum gross tonnage. Similar considerations apply here, and the IMO web site (http://www.imo.org/Conventions/mainframe.asp?topic_id=259&doc_id=685 retrieved 01 July 2009) gives the unit of measure as net tonnes (NT).
Resolution: 1

Attribute: Minimum displacement tonnage
Attribute type: Simple
Camel case: minimumDisplacementTonnage

Alpha code: MINDPL

Data Type: Integer

Definition: The minimum allowed displacement tonnage of a vessel.

Unit of measure: tonnes
Quantity: mass

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: 22254 for allowed minimum displacement tonnage of 22254.
Unit defined in the wunits attribute of the M_UNIT meta object class, e.g. metric tons (t)
Resolution: 1

Attribute: Minimum deadweight tonnage
Attribute type: Simple
Camel case: minimumDeadweightTonage

Alpha code: MINDWT

Data Type: integer

Definition: The minimum allowed deadweight tonnage of a vessel

Unit: tonnes
Quantity: mass

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: 12345 for allowed minimum deadweight tonnage of 12345.
Unit of measure: defined in the wunits attribute of the M_UNIT meta object class, e.g. metric tons (t)
Resolution: 1

Attribute: Minimum gross tonnage
Attribute type: Simple
Camel case: minimumGrossTonnage

Alpha code: MINGTN

Data Type: Integer

Definition: The minimum allowed gross tonnage of a vessel.

Unit of measure: GT
Quantity: volume

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: 98765 for allowed minimum gross tonnage of 98765.
Resolution: 1

Attribute: Minimum overall length
Attribute type: Simple
Camel case: minimumOverallLength

Alpha code: MINLOA

Data Type: Real

Definition: The minimum allowed overall length of a vessel

Unit of measure: ?
Quantity: length

Constraints:

range	[0, ∞)

References: unspecified;

Remarks: Example: 82.54 for an allowed minimum overall length of 82.54 metres.
Unit: defined in the HUNITS attribute of the M_UNIT meta object class, e.g. metre (m)
Resolution: 0.13 m or 0.13 ft

Attribute: Minimum net tonnage
Attribute type: Simple
Camel case: minimumNetTonnage

Alpha code: MINNTN

Data Type: Integer

Definition: The minimum allowed net tonnage of a vessel.

Unit of measure: NT
Quantity: volume

Constraints:

range	[1, ∞)

References: International Convention on Tonnage Measurements in Ships, 1969

Remarks: Example: 45678 for allowed minimum net tonnage of 45678.
Resolution: 1

Attribute: Nationality
Alpha code: NATION
Attribute type: Simple
Camel case: nationality
Data Type: text

Definition: The attribute “nationality” indicates the nationality of the specific object.

Constraints:

Length	2
Structure	The value must conform to ISO 3166

References: ISO 3166

Remarks: No remarks.

Attribute: Object name
Attribute type: Simple
Camel case: objectName

Alpha code: OBJNAM

Data Type: text

Definition: The individual name of an object.

References: INT 1: ID 7, IF 19, IN 12.2-3; M-4: 371; 323.1-2; 431.2-3; 431.5;

Remarks: no remarks
[This Hydro attribute needs adapting for multi-language datasets.]

Attribute: Object name in national language — Alpha code: NOBJNM
Attribute type: Simple
Camel case: objectNameInNationallanguage — Data Type: text

Definition: Name of object (c…): string of national characters.

References: INT 1: ID 7, IF 19, IN 12.2-3; M-4: 371; 323.1-2; 431.2-3; 431.5;

Remarks: The attribute encodes the individual name of an object in the specified national language. [This Hydro attribute needs adapting for multi-language datasets. If that constraint for OBJNAM works this attribute can disappear]

Attribute: Performance
Alpha code: PRFMNC
Attribute type: Simple
Camel case: performance
Data Type: text

Definition: A description of the required handling characteristics of a vessel including hull design, main and auxiliary machinery, cargo handling equipment, navigation equipment and manoeuvring behaviour.

References: unspecified

Remarks: No remarks

Attribute: Periodic date end | Alpha code: PEREND
Attribute type: Simple
Camel case: periodicDateEnd | Data Type: Date

Definition: The end of the active period for a seasonal object (e.g. a buoy). See also “date end”.

Constraints:

Structure	The value should be encoded using 4 digits for the calendar year (CCYY), 2 digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD). `CCYYMMDD` (full date); `--MMDD` (same day each year); `--MM` (same month each year) This conforms to ISO 8601:1988.
Other	If an object has either of its PERSTA/PEREND attribute values non-null, the other must also be non-null.

References: ISO 8601:1988

Remarks: Example: `--1015` for an ending date of 15 October each year

Attribute: Periodic date start — Alpha code: PERSTA
Attribute type: Simple
Camel case: periodicDateStart — Data Type: Date

Definition: The start of the active period for a seasonal object (e.g. a buoy). See also “date start”.

Constraints:

Structure	The value should be encoded using 4 digits for the calendar year (CCYY), 2 digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD). `CCYYMMDD` (full date); `--MMDD` (same day each year); `--MM` (same month each year) This conforms to ISO 8601:1988.
Other	If an object has either of its PERSTA/PEREND attribute values non-null, the other must also be non-null.

References: ISO 8601:1988

Remarks: Example: `--04` for an operation starting in April each year

Attribute: Pictorial representation | Alpha code: PICREP
Attribute type: Simple
Camel case: pictorialRepresentation | Data Type: text

Definition: Indicates whether a pictorial representation of the object is available. The string encodes the file name of an external graphic file (pixel/vector) as permitted in the list of allowed support formats.

References: INT 1: IE 3.1-2; M-4: 456.5; 457.3;

Remarks: The “pictorial representation” could be a drawing or a photo.

Attribute: Regulation / restriction / recommendation code — Alpha code: RXNCOD
Attribute type: Simple
Camel Case: rxnCode — Data Type: Enumeration

Definition: This attribute encodes the most common types of regulations (recommendations, restrictions).

Values:

Code	Name	Definition
1	Pilotage compulsory	Pilotage is compulsory
2	Pilot qualifications	Pertaining to the qualifications of pilot (details described in INFORM attribute or TXTDSC file)
3	Passage prohibited	Passage prohibited at all times
4	Passage conditionally prohibited	Passage prohibited under certain weather conditions (details in INFORM or TXTDSC file)
5	Overtaking prohibited	Overtaking prohibited at all times
6	Overtaking conditionally permitted	Overtaking permitted only under certain conditions (stated in INFORM/TXTDSC file)
7	Restricted passage	Pertaining to head-on situations in restricted passages or fairways (details in INFORM or TXTDSC file)
8	Tugs	Tug assistance compulsory
9	Quarantine and health	Quarantine and health
10	Customs	Customs
11	Loading and unloading	Loading and unloading cargo
12	Drawbridge operations	Drawbridge operations
13	Navigation prohibited	Navigation prohibited
14	Right of way	Pertaining to right of way
15	Traffic permission required	Permission required from an authority for transit
16	Dimensional	Applicable only to vessels exceeding specified dimensions (associated chalim will specify limits)

Remarks: This attribute encodes the most common types of regulations (recommendations, restrictions) in a form that software (e.g., ECDIS) can use to do at least some subject-specific processing. Since the details are in natural language (i.e., as text in INFORM), this will not be comprehensive, but (a) it should be possible to use this in conjunction with “chalim” in some cases to provide enhancements like automatic indicators in the ECDIS/ECS that passage is forbidden for vessels of certain size; (b) provide hints, such as a hint that pilotage is *probably* compulsory, etc.

Attribute: Scale maximum — Alpha code: SCAMAX
Attribute type: Simple
Camel case: scaleMaximum — Data Type: Integer

Definition: The maximum scale at which the object may be used e.g. for ECDIS presentation. The modulus of the scale is indicated, that is 1:25 000 is encoded as 25000.

Unit of measure: None
Resolution: 1

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: If a particular maximum scale is specified as 1:25 000 (encoded as 25000), an example of a larger scale would be 1:20 000 (encoded as 20000).

Attribute: Scale minimum — Alpha code: SCAMIN
Attribute type: Simple
Camel case: scaleMinimum — Data Type: Integer

Definition: The minimum scale at which the object may be used e.g. for ECDIS presentation. The modulus of the scale is indicated, that is 1:25 000 is encoded as 25000.

Unit of measure: None
Resolution: 1

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: If a particular maximum scale is specified as 1:25 000 (encoded as 25000), an example of a larger scale would be 1:20 000 (encoded as 20000).

Attribute: Source date | Alpha code: SORDAT
Attribute type: Simple
Camel case: sourceDate | Data Type: Date

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

Constraints:
Format CCYYMMDD. The source date should be encoded using 4 digits for the calendar year (CCYY), 2 digits for the months (MM) and 2 digits for the Day (DD), according to ISO 8601: 1988.

References: ISO 8601: 1988

Remarks: No remarks.

Attribute: Source indication
Alpha code: SORIND
Attribute type: Simple
Camel case: sourceIndication
Data Type: ?

Definition: Information about the source of the object.

[Should be defined by TSMAD since this is metadata for individual objects including ENC objects.]

References: unspecified;

Remarks: ?

Attribute: Status
Attribute type: Simple
Camel case: status

Alpha code: STATUS

Data Type: Enumeration

Definition: ?
Values:

Code	Label	Definition	References
1	permanent	intended to last or function indefinitely. (The Concise Oxford Dictionary, 7th Edition)	
2	occasional	acting on special occasions; happening irregularly. (The Concise Oxford Dictionary, 7th Edition)	INT 1: IP 50; M-4: 473.2;
3	recommended	presented as worthy of confidence, acceptance, use, etc. (The Macquarie Dictionary, 1988)	INT 1: IN 10; M-4: 431.1;
4	not in use	no longer used for the purpose intended; disused.	INT 1: IL 14, 44; M-4: 444.7;
5	periodic/intermittent	recurring at intervals. (The Concise Oxford Dictionary, 7th Edition)	INT 1: IC 21; IQ 71; M-4: 353.3; 460.5;
6	reserved	set apart for some specific use. (adapted from The Concise Oxford Dictionary, 7th Edition)	INT 1: IN 12.9;
7	temporary	meant to last only for a time. (The Concise Oxford Dictionary)	INT 1: IP 54;
8	private	not in public ownership or operation.	INT 1: IQ 70;
9	mandatory	compulsory; enforced. (The Concise Oxford Dictionary, 7th Edition)	
11	extinguished	no longer lit	
12	illuminated	lit by floodlights, strip lights, etc.	
13	historic	famous in history; of historical interest. (The Concise Oxford Dictionary, 7th Edition)	
14	public	belonging to, available to, used or shared by, the community as a whole and not restricted to private use. (adapted from The New Shorter Oxford English Dictionary, 1993)	
15	synchronized	occur at a time, coincide in point of time, be contemporary or simultaneous. (The New Shorter Oxford English Dictionary, 1993)	
16	watched	looked at or observed over a period of time especially so as to be aware of any movement or change. (adapted from The New Shorter Oxford English Dictionary, 1993)	
17	un-watched	usually automatic in operation, without any permanently-stationed personnel to superintend it. (adapted from IHO Dictionary, S-32, 5th Edition, 2814)	
18	existence doubtful	an object that has been reported but has not been definitely determined to exist	

.

References: ?

Remarks: No remarks

Attribute: Textual description | Alpha code: TXTDSC
Attribute type: Simple
Camel case: textualDescription | Data Type: text

Definition: The file name of an external text file that contains the text ~~in English~~.
[Specification needed from TSMAD, especially for multi-lingual representation of contents.]

Remarks: The attribute “textual description” indicates that a file containing text extracted from relevant pilot books or navigational publications is available.

Attribute: Thickness of ice capability
Attribute type: Simple
Camel case: thicknessOfIceCapability

Alpha code: ICECAP

Data Type: Integer

Definition: The thickness of ice that the ship can safely transit.

Unit of measure: centimetres
Quantity: length

Constraints:

range	[1, ∞)

References: unspecified;

Remarks: Example: 080 for ice which has a thickness of 80 cm

Annex C. Feature Associations

TBD.